

Examining The Impact of Campus Intramural Sports Participation on Students' Sense of
Community Using A Pre-Test Post-Test Design

Stephen Arkell, BRLS

Applied Health Sciences (Leisure Studies)

Submitted in partial fulfillment
of the requirements for the degree of

Master of Arts

Faculty of Applied Health Science Brock University
St. Catharines, Ontario

© 2020

Abstract

Participation in out-of-class activities and campus recreation/intramural sports are some of the most popular activities for students on college campuses and one of the most beneficial social outlets for students. However only recently has this connection been examined more deeply. Due to the overwhelming number of students participating in these programs and services it is important to examine the impact of participation in an attempt to better understand the degree to which involvement in campus recreational sports contributes to students' sense of community. The purpose of this quantitative pre-test post-test study was to examine changes in students' perceived sense of community over the duration of an intramural season. One hundred and forty-seven intramural participants (N=147) completed a pre-test questionnaire on their first week of their intramural sport season and a post-test on their last week of their intramural sport season. The initial plan of analysis to complete a Repeated Measures Multiple Analysis of Covariance (MANCOVA) was stopped promptly due to high mean scores from participants. For each question and factor the data was so consistently skewed and high it was simply not normally distributed leading to assumptions to be broken immediately. A Non-parametric design model Wilcoxon signed-rank test was used to analyze the data instead which indicates that there was not a significant change testing factors mean score ranks between the pre and post-test. This finding demonstrates that there was not a significant difference in participants perception of sense of community but rather participants had high perceived feelings of sense of community both times they were tested. This study supports the findings of previous research which has found that those students who are involved in recreational sports in a post-secondary environment receive both perceived feelings of sense of community but also relationship building opportunities and experiences. Future research should focus on studying perceptions of

sense of community and to explore other areas of a campus community, such as; clubs, varsity sports teams, events, etc. Through studying other areas of a campus community there would be the ability to indicate if there are differences or similarities between feelings of sense of community by specific programs.

Key Words: Campus Recreation, Intramural Sports, Sense of Community, Perceived Community

Table of Contents

<i>Chapter 1: Introduction</i>	1
Significance of Study	5
Personal Significance	6
Delimitations	7
Assumptions	9
Purpose of the Study.....	9
Hypotheses	9
<i>Chapter 2: Literature Review</i>	11
A Brief History of Campus Recreation	11
Social benefits of intramural sports	14
Students' Perceived Sense of Campus Community	18
Sense of Community	23
Measuring Sense of Community in Sport	27
Conclusion.....	30
<i>Chapter 3: Methods</i>	32
Introduction	32
Research Design	32
Sample Size	33
Intramural Sport Program.....	34
Ethics	36
Instrumentation.....	37
Reliability and Validity	38
Data Collection.....	38
Data Analysis.....	39
Summary.....	40
<i>Chapter 4</i>	42
Data Analysis.....	42
Data Screening.....	42
Background Demographics	43
Post-test SCS Scale.....	49
Data Analysis.....	53

Summary of Findings	54
<i>Chapter 5</i>	56
Background demographics	56
Pre-test	57
Post-test	57
Non-parametric design model Wilcoxon signed-rank test	58
Limitations.....	59
Internal: Research Design.....	59
External: Generalizability	62
Implications for theory	62
Implications for practice	66
Future research recommendations	67
Conclusion	70
<i>References</i>	72
<i>Appendix</i>	84

Tables

TABLE 1: FREQUENCIES FOR GENDER AND AGE44

TABLE 2: FREQUENCIES FOR YEAR AT INSTITUTION AND YEARS AT BROCK45

TABLE 3: FREQUENCIES FOR ETHNICITY AND PLACE OF RESIDENCE45

TABLE 4: FREQUENCIES FOR INTRAMURAL SPORTS DIVISION46

TABLE 5: PRE-TEST SCS SCALE47

TABLE 6: POST-TEST SCS SCALE.....50

TABLE 7: PRE-TEST / POST-TEST RESULTS53

TABLE 8: DIFFERENCES BY FACTORS54

Figures

FIGURE 1: SENSE OF COMMUNITY IN SPORT FACTORS (WARNER ET AL. 2013)26

FIGURE 2: SENSE OF COMMUNITY IN SPORT FACTORS WITH DEFINITION
(WARNER ET AL. 2013).....27

Chapter 1: Introduction

The connection between post-secondary campus sport experiences and participants' sense of community has been increasingly explored in academia over the last several decades (Artinger, L., Clapham, L., Hunt, C., Meigs, M., Milord, N., Sampson, B., & Forrester, S, 2006; Elkins, Forrester, & Noel-Elkins, 2011; Phipps, Cooper, Shores, Williams, & Mize, 2015). The impacts of this recreational involvement have been examined in a variety of ways such as the impact on individual students as well as the benefits to post-secondary institutions as a whole. This focus on different impacts provides unique perspectives of its importance to each group.

In recent history, the way individuals in society interact has greatly changed. Individuals today are more independent and have fewer meaningful social connections and engagement in their community (Heller, 1989; McPherson, Smith-Lovin, & Brashears, 2006; Olds & Schwartz, 2009, Putnam, 2000). Due to this change and structure of communities, many people do not find themselves included in residential communities where they would be able to engage and be supported by others. This loss of connection with their community around them reduces the benefits one can receive from their community (e.g, increased health and well-being, reduced stress; Warner, Kerwin, Walker, 2013). This has led individuals to reach out from their residential areas and create communities based on common interests and work-related skills (Durkheim, 1933; Warner, 2012a).

However, community is becoming even more rare today. Research has suggested that fewer and fewer individuals are gaining the benefits of a sense of community. According to research, societies that are divided socially are more likely to collapse (Rodrik, 1999a, 1999b). When the typical journey of a student is considered in relation to these societal factors a picture

emerges of individuals who could be isolated and have a reduction in social health. Social health is an individual's well-being that encompasses their interactions and relationships with others, how others react to and interact with the individual, and how the individual interacts with societal institutions (Russell, 1973). Students who attend college typically move away to a new city with a new living arrangement. These students will have a new area of study as their primary focus with new colleagues and new social groups with a multitude of interests and skills, all while they are under intense stress looking to achieve academic success. These changes are extensive and rapid, typically in a span of four years. These students are in a time in their lives where they will look to determine their identity and place in their post-secondary setting and, to a larger extent, their place in the world.

Managing our social relationships and place in society may be one of our greatest challenges moving forward as a species (Weare, 2000). This is no different for students. Understanding how students associate with one another and ultimately define and feel sense of community is connected to society as a whole and the social health of the individuals within society. Students in their post-secondary years develop new connections with their interests with many turning to recreational opportunities. Recreational opportunities have the ability to bring together those who participate in them as “outside of structured freshmen programs, recreation may be the single common bond between students” (Bryant, Banta, & Bradley, 1995, p. 158). This bond can have a significant impact on each of these individuals' unique post-secondary experiences, as well as who they are when they graduate.

Participation in out-of-class activities and campus recreation/intramural sports are some of the most popular activities for students on college campuses (Forrester, 2014), and one of the most beneficial social outlets for students (Henchy, 2011). However only recently has this

connection been examined more deeply. Campus recreation consists of intramurals and sports clubs, fitness and wellness programs, aquatics, outdoor and adventure pursuits, informal recreation, instructional, and adaptive programs (Franklin, 2013). Students have the opportunity to participate in a multitude of programs, services, sports and activities. Campus recreation is growing and is widely appreciated on college campuses today as “over 85% of students who live on campus nationwide participate in some form of recreational sports, 62% of students who live off campus participate” (Danbert, Pivarnik, & Washington, 2014, p. 16). Students nationwide are participating in recreational activities and are personally benefiting; however, there are also benefits of this participation as it relates to the institution as a whole. Researchers have examined student involvement/engagement beyond the classroom going beyond the sports and games, activities and events, wins, losses and championships in order to determine the true social benefits of out of classroom activity and sport and the impact it has on students’ sense of community.

Post-secondary institutions have an interest and investment in the impact of campus recreational activities on students. Post-secondary institutions are facing declining student enrollment patterns throughout Canada, but particularly in the province of Ontario (Robertson, 2014). As a result, these institutions are facing reductions in funding and finances due to the decrease in student enrollment. More than ever, these institutions need to be fiscally responsible to ensure that programs and services are provided as they were designed, and the future of the institution is secure. One way to assist with the financial burden to institutions is to combat attrition rates of students. Post-secondary institutions have an imperative to retain students by focusing on the student experience, experiential learning opportunities, and creating

opportunities for students to become engaged and integrated into the social fabric of the institution (Forrester, McAllister-Kenny, & Locker, 2018).

Recreational programs and services have been linked to the retention of students. “Intramural participants had a 99% fall-to-fall retention rate entering year two, and a 98% year three and year four retention rate. The fall-to-fall retention rates for all undergraduate students were again lower, ranging from a high of 87% entering year two and a low of 70% entering year four” (Forrester, McAllister-Kenny, & Locker, 2018. p.69). Those who use student recreational centers frequently are also more likely to be retained by the university, experience place bonding, social belonging to the recreation center and the university, integration into the university and retention of their place at the university (Miller, 2011). This is of big importance to post-secondary institutions as those who remain enrolled continue to pay tuition to support the institution financially as they receive their undergraduate and graduate education.

Retention has also been studied historically. In a longitudinal study of more than 250,000 students, Astin (1984; 1993) formulated a theory of student development that he labeled “student involvement theory” which accounts for “virtually every significant effect that contributed to the student’s remaining in college” (p. 302). Involvement refers to “the quantity and quality of the physical and psychological energy that students invest in the college experience” (Astin, 1984, p. 307). More specifically, Astin (1993) states, “participating in intramural sports has a substantial positive effect on physical health, alcohol consumption, and attainment of a bachelor’s degree” (p. 386). In addition, student participation in intramural sports has been shown to have a significant positive effect on satisfaction with student life and the overall college experience (Astin).

Tinto's (1987) Model of Institutional Departure has been one of the most influential models for understanding retention since its inception. In his model of retention, Tinto proposed that colleges and universities consist of both academic and social systems and further theorized that high levels of integration into these systems lead to greater social integration, which in turn leads to greater institutional commitment and a greater likelihood that the student would persist. Outside of the formal and informal academic system that comprises students' institutional experiences, a key component of this model measures students' involvement in extra-curricular activities, leading to social integration and resulting in increases in students' institutional commitment. Tinto (1987) specifically identified "extra-curricular programs, and intramural sports, for example, may all serve to provide individuals the opportunity to establish repetitive contact with one another in circumstances which lead to the possibility of incorporation into the life of the college" (p.99). These studies demonstrate the link between campus recreational activities and how they connect with school retention.

Significance of Study

In a study of over 33,500 students from 38 different colleges across the United States Forrester (2014) found that 75% of students used campus recreational services, programs, activities or facilities and 80% of these students used these services at least once a week. Forrester also found that 64% of students reported that participation in campus recreation provided them with skills and abilities useful after college. Considering how these figures could be extrapolated to the greater mass of post-secondary institutions demonstrates the extent of campus recreation participation. Seen in the past to many individuals as a time filler activity, or a for fun sport outside the classroom, these services are a consistent part of post-secondary life for students. There is a lack of recognition that students have about fifteen hours of class time and

substantially more time out of class (Elkins, Forrester, & Noel-Elkins, 2011a). This free time has led to students becoming more and more involved in their campus community and developing their own experiences and creating their own campus culture. Due to the overwhelming number of students participating in these programs and services it is important to examine the impact of participation in an attempt to better understand the degree to which involvement in campus recreational sports contributes to students' sense of community.

Personal Significance

Campus recreation programs and services have been an essential part of my success as an undergraduate and graduate student. My participation in these programs and services, especially intramural sports, has afforded me the opportunity to be social and meet individuals and groups I would have never had the chance to have met otherwise. I have been granted the ability for friendships to develop and grow simply just by being involved. My involvement has allowed me to be active and fit as well as gave me a rest and escape from my hyper competitive career as a varsity rugby player and full-time student. The breaks that campus recreation gave me allowed me to de-stress as well as pushed me to get through the toughest points in my studies and personal life. Campus recreational sports was my connection to my institution and it made me feel like I was part of something greater than myself. I had the privilege of sharing these programs and services to new students in my time as a residence life staff and I saw first-hand during this time how a little involvement in these services could engage a student and make them a part of a campus community and see them flourish in all aspects of their new environments. These programs, facilities and services offered are a great way for students to become involved with their institution while receiving multiple benefits of; social, physical, academic, mental, emotional, etc. and I am privileged to have the opportunity to access them. Throughout this

study, the aim is to gain information and evidence to demonstrate campus recreation is a significant factor in creating sense of community for the students participating in it.

Delimitations

This study is quantitative by nature and is using a theoretical approach following a review of literature on campus recreation to guide the research. This study is delimited to undergraduate students currently participating in post-secondary on-campus intramural sport. This study will be completed at a singular post-secondary institution. This will limit the perceived feeling of sense of community to this sole campus location. The study will be further delimited by being completed within a specific intramural program of the campus recreation department.

Limitations

Limitations of this study include the structure of the survey tool provided. The Sense of Community Scale (SCS) (Warner, Kerwin, & Walker, 2013) uses a four-point Likert scale system for its questions (i.e., Not at all True, Somewhat True, Mostly True, Completely True) to determine participant responses to the items. This response system may force participants to choose an option they do not truly feel. This is a common limitation in quantitative research by not having any open-ended response questions and limits participants' ability to expand on their answer and provide further insight into their response elaborating on their chosen answer. A survey-based tool limitation is that participants may not complete the tool accurately or completely. Another limitation is the focus on campus recreation. This will limit generalization to only focus on campus recreation and more specifically intramural sport participation. Conducting the study at one post-secondary institution limits generalizations beyond the institution it was conducted at. Another generalization limitation can be related to the time between pre-test and post-test data collection points. With only six weeks separating each

collection point changes in participants perceived sense of community will be restricted to this time potentially limiting the extent of change.

The Pre-test-Posttest methodology of using the SCS scale also poses threats to internal validity of the study, another limitation of the study. The threats most common to pretest/post-test designs include *history*, *maturation*, *testing effect*, *instrumentation*, and *regression to the mean* (Frey, 2018). *History*: Many events in addition to intramural participation may occur between administration of the pre-test and the post-test and may account for some of the observed changes. This could be as simple as students increasing other involvement with the campus community between the pre- and post-test. For example, a student becoming involved with a campus club or a student develops a social network in residential life or off campus housing. *Maturation*: This suggests that it is impossible to cover all possible biological or psychological changes that naturally occur with the passage of time. This may relate to a student's coming of age physically or mentally which may lead to heightened feelings of sense of community between the pre and post-test. *Testing Effect*: Testing effect refers to the effect of the pre-test itself. Changes in the post-test might result from the pre-test independently of the subsequent intervention because simply participants could remember the questions in the pre-test and try to replicate their feelings. *Instrumentation*: Instrumentation indicates changes in measuring instruments that may explain pre-test–post-test differences. Students may overestimate their feelings in the pre-test and give a more informed evaluation as a result of a better understanding of their feeling of sense of community in the post-test. Students may also attempt to impress a facilitator in the post-test knowing the purpose of the study, trying to respond in a way which would give the results they perceive the researcher is looking for. *Regression to the Mean (RTM)*: RTM biases the conclusion of the pre-test–post-test design when

participants are selected based on extremely low or high pre-test scores, as the extreme pre-test scores tend to move closer to the average over time. This could be caused by participants selecting extremely high or low values in an attempt to complete the survey faster. If pre-test scores are extremely high, then post-test scores will tend to be lower and vice versa. These results are not caused by intervention or other effects like test–retest effect but are related to errors of measurement.

Assumptions

This study assumes that participants competing in intramurals are current undergraduate/graduate students attending the post-secondary institution. At this institution intramural access is limited to solely registered students. Due to the little constraints preventing students from participating in intramurals an assumption is made in relation to the sample being reflective of the whole post-secondary’s population. An assumption is made that with the focus of the intramural recreational program that students participating are playing “recreationally” and have freely chosen to participate.

Purpose of the Study

The purpose of this pre-test post-test study was to examine changes in students’ perceived sense of community over the duration of an intramural season.

Hypotheses

Null Hypothesis: Participation in campus intramural sports will not lead to a significant increase in students’ perceived sense of community when compared with the independent variables of gender, year at institution, post- secondary (years), ethnicity, residence, intramural division and level of play.

Research Hypothesis: Participation in campus intramural sports will lead to a significant increase in students perceived sense of community when compared with the independent variables of gender, year at institution, post- secondary (years), ethnicity, residence, intramural division and level of play.

Chapter 2: Literature Review

The following literature review focuses on the relationship between students' sense of community and campus recreational intramural programs. Through the evaluation of past research this review includes a descriptive analysis of six sections relevant to the study. These six sections include: a brief history of campus recreation programs, benefits of campus recreation participation, social benefits of intramural sports, students' perceived sense of campus community, sense of community, and measuring sense of community in sport.

The brief history of campus recreation will examine the significant points in history that has led campus recreation to become what it is today. Benefits of recreation participation will examine the different specific takeaway benefits that individuals receive from recreation participation including previous research examining: health benefits, educational benefits, and recruitment/retention. Social benefits of intramural sports will present an in-depth analysis of previously researched social benefits as a result of participation in intramural sport. Students' perceived sense of campus community will explore the deeper connection students' have with their post-secondary institutions. Sense of community will highlight the findings of previous studies examining the relationship between sense of community and participation in collegiate recreational sports. Measuring sense of community in sport will explore the development of the sport specific scale that will be used in this study. Overall, through evaluation of past literature this chapter will provide an understanding of the relevant information guiding the study.

A Brief History of Campus Recreation

Campus recreation is becoming an essential part of the university experience. Any recreational activities that occur on the campus of a university can be classified as campus recreation and there are numerous types of it. Campus recreation consists of intramurals and

sports clubs, fitness and wellness programs, aquatics, outdoor and adventure pursuits, informal recreation, instructional and adaptive programs (Franklin, 2013). The field of campus recreation is growing and has high participation on college campuses today as “over 85% of students who live on campus nationwide participate in some form of recreational sports, 62% of students who live off campus participate” (Danbert, Pivarnik, & Washington, 2014, p. 16). Recreation and education have gone hand and hand for decades. The first campus recreation programs were developed between the 1920's and 1960's and stemmed from a combined effort from a department of athletics and recreation (Hall, 2010). In the early days, campus recreation was seen in a much different light than today. Campus recreation had its humble beginnings in religious colleges across the United States in the early 1800's as a way to train the body along with the mind (Franklin). These physical activities were a stark contrast to the campus recreation we know today as they were more directed to strict physical exercise with little to no choice or input from the students themselves. These activities were shortly abandoned by the students due to the lack of enjoyment and desire to play. Students began instead to look beyond the classroom in search of activities they could do with their peers involving physical activity.

From the middle to the end of the 19th century “college life”, which was outside the classrooms’ functions, and activities beyond school control, were created, organized, and controlled by students (Franklin, 2013). This spawned the social interest into sport, specifically interclass (i.e., early form of intramurals with consisted of year of study levels competing against each other) and intercollegiate sport. Intercollegiate sport, which is two post-secondary institutions playing against each other, first occurred in 1852 in a rowing race between Harvard and Yale student boat clubs (Franklin). As student interest increased, intercollegiate sport has then continued to become the extensive program it is today. As intercollegiate sports became

more and more commercial, there was a need from students that wanted something to do rather than just intense fitness activities or simply watching their varsity level peers. There was a push for competition and athletics for the everyday student (Franklin). The term intramural sport, or “sport 'within the walls' (Mitchell, 1929, p. I), refers to team and dual or individual activities, tournaments, meets, and special events that are limited to participants and teams who come from within a specific school or institutional setting” (Franklin, p. 10). Numerous authors have claimed that the first true intramural contest was a baseball game held between first- and second-year students at Princeton in 1857 (Hyatt, 1977; Means, 1973; Mueller, 1971; Stein, 1985).

To house on-campus athletics, post-secondary institutions-built spaces for students to participate in them. These facilities were established with the goal of creating successful athletic programs and attracting students (Lindsey & Sessoms, 2006). Recreation facilities were updated slowly and based themselves on the facilities that other campuses had. These facilities were created relatively the same all the way up to the 1970's with the academic departments of the university and the athletic departments footing the costs associated with them. In the 1970's extensive growth began to occur. The reason for this expansive growth was more money being allocated for these facilities. New facilities being built were expected to serve more than just student athletes because students, through fees and charges, were funding their own recreation centres on campus (Kooman, 1976). Because of student money being used, students suddenly had much more input as to the nature of these facilities. Campus recreation centres went beyond just simply the varsity athlete and were opened to all. This led to more student-oriented facilities and more non-varsity recreational teams and activities (Woosam, 2006). The 1980's and 1990's brought great change and an increasing amount of support for recreational programs and facilities on college campuses resulting in exponential growth (Barcelona & Ross, 2002). This

time period expanded recreational participation by removing barriers for participation. The introduction of anti-discrimination and equal access for all legislation in the United States with Title IX and the creation of the Canadian Charter of Rights and Freedoms Section 15 pushed institutions to ensure that all recreational services provided were equal and open for all. As more and more students joined in from their new-found access and participated in more recreational programs and services, university administrators recognized the trends and overwhelming support for recreational facilities beyond just varsity athletics. Researchers began to take note that students were receiving benefits as a result of their participation in recreational programs and services on campuses.

Benefits of Campus Recreation Participation

The health, educational, recruitment and retention benefits of participation of campus recreational sports have been well examined in the literature. Numerous studies investigate the benefits that participation in campus recreational sport has on participants: Health (Allen & Ross, 2013; Ellis, et al., 2001; Lindsey & Sessoms, 2006); Educational/ Academic Success (Belch, Gebel & Maas, 2001; Danbert et al., 2014; Gibbison, Henry & Perkins-Brown, 2011; Huesman, Brown, Lee, Kellogg, & Radcliffe, 2009); Recruitment (Art and Sciences Group., 2000; Henchy, 2013; Lindsey & Sessoms, 2006; Zizzi, Ayers, Watson, & Keeler, 2004); and Retention (Christie & Dinham, 1991; Forrester, McAllister-Kenny, & Locker, 2018; Gibbison et al., 2011; Miller, 2011). However, there is a need to look beyond these benefits and to see how students feel in regard to their experience and the social benefits that participation has on a participant.

Social benefits of intramural sports

Recreation facilities and programs provide participants with many social benefits. Beyond the classroom, students value, and most often remember, the life-skills and relationships

they develop while in college (Dalgarn, 2001). “Social” benefits have been examined in different contexts by a variety of researchers and each have resulted in unique perspectives on what students receive as a result of their participation

The social benefits of intramural sports were explored by Artinger et al. (2006). This team of researchers explored what social benefits undergraduate students received as a result in their participation in intramural sports. Students participating were given a questionnaire at random. In order to measure social benefits of intramural sport participation questions were broken down into five categories based on previously reviewed research: university integration, personal social benefits, cultural social benefits, social group bonding, and reliable alliance benefits. Artinger et al. found significant differences in the reported social benefits of intramural sports participation between on-campus and off-campus students, first- and fourth-year students, males and females, and differences in reported social benefits based on the number of intramural sports played. The researchers determined that campus recreation programs should be linked with broader intuitional goals of retention by emphasizing their role in social integration of students through participation in various recreational sport offerings. The authors suggested the field of recreational sports can use the findings from the study to guide recreational sports research, policy development, and management. Future research to develop psychometrically sound instruments to measure the social, and other, benefits of recreational sports involvement is needed because the scale measuring social benefits failed to factor analyze and the scale had little construct validity (Artinger et al).

Sturts and Ross (2013) explored social outcomes of participation in intramural sports. Using the same scale developed and used by Artinger et al. (2006), this study consisted of a sample of students participating in an intramural basketball league who completed a

questionnaire. Findings revealed differences in social outcomes related to gender, age, year in school, ethnicity, residence, and division of competition. Differences were found between groups (gender, age, year in school, residency and ethnicity) in the degree of social outcomes experienced. The researchers found that participation in recreational sports provided many social outcomes for college/university students that can help develop satisfaction, growth and creation of positive social networks.

In addition, Henchy (2011) examined ways in which participation in campus recreation positively influenced students' lives. The study was completed by students randomly selected at a college in the United States. Students completed a campus recreation questionnaire that was emailed to them. The survey was based on the NIRSA/Student Voice Campus Recreation Impact Study survey (NIRSA, 2010). The study results showed that students reported a variety of benefits including health and social benefits from their participation in campus recreation facilities and programs. The social benefits results showed that 81% of students agreed that participating in recreation activities had helped them to feel more at home at the university. Furthermore, when students were asked how they most often used the campus recreation facilities, 48% of students indicated that they used campus recreation facilities alone, 38% of students used campus recreation facilities with a partner, and 14% of students used campus recreation facilities with two or more people. Thirty-four percent of students felt their sense of belonging/ association strongly or moderately improved from participating in campus recreation activities. In addition, 33% of students felt their opportunity to develop friendships had strongly or moderately improved from participating in campus recreation activities.

Similarly, Miller (2011) examined why college recreation centers are important to student life and explored the overall benefits students receive from the program as a whole. Miller

surveyed students as they entered the campus recreation centre using a 20-item scale developed by the researchers. The study revealed that students who used the student recreation center more frequently were more likely to experience place bonding, social belonging to the recreation center and the university, integration into the university and hence retention at the university. This study demonstrated the impact that recreational spaces and programs have on students' social benefits. The authors suggested for future research an investigation of participation in specific programs offered at the student recreation center, such as intramurals or outdoor recreation programs, as potential reasons for student retention and social belonging may be warranted.

Power and Forrester (2017) examined the relationship between participation in intramural sports and social integration into the campus community. The researchers gave participants in a variety of intramural sports questionnaires to complete. These questionnaires' were made up of three sections: 1) demographic factors, such as gender, age or year of study; 2) quality of participation/ personal investments measured using the personal investments scale from the Athlete's Opinion survey (Scanlan, Simons, Carpenter, Schmidt & Keeler, 1993) consisting of four questions measuring the effort, energy, time and money a student invests in their intramural sports participation; and 3) social benefits measured using the social integration scale from the College Persistence Questionnaire (Davidson et al., 2009) which included eight questions examining a student's shared values, sense of belonging, and similarity to others within the college environment. Power and Forrester found that the quality of intramural participation, consisting of the effort, time, and money a student invests, significantly predicted social integration into the campus community. They determined that the quality of involvement as measured by "Personal investments" (personal resources that are into an activity and cannot be

recovered if participation is discontinued), was a significant contributing factor to a student's social integration into their campus community. The authors suggested one area for future research would be to collect data from individuals at multiple points during an academic term as it could result in a more heterogeneous measure of students' breadth and depth of student participation.

These previous studies demonstrate that there are a variety of social benefits that are being achieved by participation in campus recreation activities by students, however there is a lack of definitional consensus in terms of how social benefits are defined and measured in these studies. Given the numerous ways social benefits have been defined, there have also been inconsistencies in the ways social benefits have been measured often resulting in measures having little construct validity (Artinger et al., 2006), relatively low reliability (Power & Forrester, 2017) or single question measures of social benefits (Henchy, 2011; Miller, 2011). There has also been a lack of a sport focus to measuring social benefits and an over-reliance on non-experimental research designs failing to truly examine impacts of intramural participation on changes in social benefits to participants.

Students' Perceived Sense of Campus Community

In addition to seeing social benefits in recreational sports participants, there is a deeper connection students have with their post-secondary institutions. The exploration of how students are connected to their university community has challenged researchers to examine college life outside the classroom to see what defines students' sense of campus community and what educators and administrators in colleges and universities can do to build community on campus.

Cheng (2004) examined different aspects of students' college life to articulate their perceptions of campus community. The data used in this study were drawn from an annual

enrolled student survey. The survey was online, with the target population including currently enrolled students of first-year, sophomore, and junior classes. Special attention was given to the design of questionnaire items that addressed the campus community issues, with the goal of assisting student affairs administrators in articulating the concept of community on this particular campus environment. A total of 26 items were developed to address community issues, with some adopted from Janosik's (1991) The Campus Community Scale based on Boyer's (1990) principles of community and others submitted by student affairs staff of the tested institution.

From the data analysis, the author indicated that students' sense of community is closely associated with their feelings of being cared about, treated in a caring way, valued as an individual and accepted as part of a community and the quality of social life on campus. The most negative influence on community comes from students' feelings of loneliness on campus. Reflecting upon these results, this study demonstrates an even greater sense of urgency for faculty and administrators to collaborate for a common educational goal: creating a whole learning experience for students. This study was based around the needs of one specific institution, making its generalizability limited, but it encourages further research into the topic of students' perceived sense of campus community at other post-secondary institutions.

Elkins, Forrester and Noël-Elkins (2011) published a pair of articles with the intent of exploring students' perceived sense of campus community in greater detail first by examining out-of-class activities and then more specifically recreational sports programs to gather a deeper understanding of what contributes to students' perceptions of campus community.

The first article by Elkins et al. (2011a) examined how involvement in out-of-class activities influenced students' perceived sense of campus community. Three hundred and thirty respondents from a single post-secondary institution completed an on-line questionnaire that

consisted of demographics and questions related to their out-of-class involvement in 14 areas as identified by the institutions' Dean of Students Office, and a 25-item sense of campus community scale developed by Cheng (2004). Results generally indicated students with higher levels of participation in certain campus involvement areas (i.e., Campus recreation, Community service, Clubs, Faith based activities, and Intercollegiate activities) had significantly higher perceived sense of campus community within the following factors: teaching and learning, history and tradition, diversity and acceptance, residential experience, and loneliness and stress. While the overall reliability of the benefits scale was quite high and provided significant results, the internal consistency of the six campus community factors was inconsistent due to a low response count which must be considered. The authors believed that future research should also focus on specific out-of-class involvement areas (i.e., campus recreational sports participation) in order to more closely examine the influence of this involvement on students' sense of campus community. The results provide valuable information for student affairs professionals in determining how to focus programming or opportunities for student involvement so that students' involvement in these targeted activities can contribute to a sense of campus community. On a practical level, the results suggest involvement contributes to a sense of campus community but does so in a targeted way.

The second article by Elkins et al., (2011b) built upon their previous research by using the same data set collected but looked to answer different research questions. The purpose of the study was to examine the degree to which involvement in campus recreational sports programs is associated with students' perceived sense of campus community. Using the same data set of the previous study the results of the study suggested that participation in campus recreational sports significantly predicted students' perceived sense of campus community within the

questionnaire's diversity and acceptance factor. In addition, those students who participated in campus recreational sports perceived a greater sense of campus community based on the residential experience factor when compared with those students who did not participate. These results provide valuable information for student affairs and campus recreational sports professionals regarding how higher levels of involvement in campus recreation can contribute to a sense of campus community, as well as how outreach programs and strategies may provide the opportunity to increase involvement in campus recreational sports and build a stronger sense of campus community. The authors suggested that future research should also measure the depth, breadth, and quality of campus recreational sports involvement to more closely examine the impact of this involvement on students' sense of campus community. Overall this article suggests that campus recreational sports professionals should be more intentional when planning and implementing recreational sports programs to increase students' sense of campus community.

Noel-Elkins, Elkins, and Forrester (2010) also looked to define what specifically campus community is. Using past research of campus activities and recreational sports as their guide, they further explored how these individual campus activities contribute to the broader sense of campus community and effective practices for practitioners to encourage involvement that lends itself to students feeling connected and a part of the campus community. Throughout their research process the authors recognized a gap in the research in the connection between campus activities and the development of overall campus community. All of the literature about involvement and the importance of campus activities demonstrates their importance to student development. The missing link is the connection between campus activities programming and their contribution to the development of campus community. The authors suggested that there are

two different types of communities. First, there is the overall campus community most commonly cited in the research (Lloyd-Jones, 1989; Boyer, 1990). But this type of community does not necessarily address the smaller communities often developed through participation in campus activities and how these communities contribute to sense of community. From the research, Noel-Elkins et al., recognized that these students might not be able to articulate their view of the larger campus community, but they most likely will be able to articulate the sense of community they have developed with the other students participating in that same activity. These smaller communities, known as a “micro-community”, have an impact on students’ sense of the larger campus community. These communities offer researchers an in-depth look at how students determine community. Future research is encouraged by the authors on campus activities, continuing to study the far-reaching impact of student participation in campus activities as well as to explore community as a whole and what it means to students.

Upon reviewing the research, there are strong connections that can be drawn between participation in on-campus activities and students perceived sense of campus community. This being said, there are some critiques that can be made about these studies. In this previous research there has been a lack of sport focus as community has been examined on campus as a whole and not tested specifically in an athletic environment. These studies have also used non-experimental research designs and the campus community scale consistently demonstrated low levels of internal reliability. This has caused the research to fail to truly examine the impact of recreational sport and intramural participation on students’ perceived sense of campus community. This previous research has also relatively ignored micro-communities and only studied campus community as an overall experience for a student rather than examining it at the micro level in specific contexts, situations, groups, and/or activities in which students develop

peer-to-peer relationships. To fully understand the concept of community a more specific lens needs to be applied to focus upon how students perceive sense of community and what community is to them.

Sense of Community

To understand perceptions of sense of community, sense of community as a concept itself must be examined. McMillan and Chavis (1986) defined Sense of Community (SOC) as when one feels a sense of belonging to a group, that each member of the group matters to each other, and that each member's needs will be met through the group's commitment to community. This definition's creation is rooted in the review of some of the foundational history of recreational community research along with psychological theories and concepts. SOC, defined this way, has been examined by researchers in an attempt to understand its connection with recreation in a post-secondary environment.

Phipps, Cooper, Shores, Williams, and Mize (2015) looked to investigate the relationship between intramural sports participation and sense of community among college students. The research team invited students through email to complete the Sense of Community Index-2 (SCI-2) (Chavis, Lee, & Acosta, 2008) which measured four factors that contributed to one's sense of community (SOC): membership, influence, integration and fulfillment of needs, and shared emotional connection (McMillan & Chavis, 1986). After data collection, 250 students completed the study. Results of the research indicated that first and second year students experience greater levels of overall SOC compared to third and fourth years. Students who participated longer in intramural sports experienced higher levels of SOC. The study presented suggestions based upon the results regarding intramural sports marketing, programming, and retention in hopes that recreational sports administrators could use the data to benefit other institutions.

Researchers have spent time trying to expand the knowledge of how and when SOC is created within a sport context. Warner and Dixon (2011) looked to support the idea that sport programs are often charged with creating a sense of community (SOC). They believed this research would benefit participants on and off the field of play since SOC is specific to the setting (Hill, 1996) and since most research at that point had been conducted outside of sport; the literature had not yet fully demonstrated how and when SOC is created within a sport context. The researchers looked to challenge this by utilizing a grounded theory and phenomenological approach and investigated the mechanisms for creating SOC within a sport setting. The researchers completed semi-structured interviews with 20 former NCAA athletes regarding their sport experience. The results revealed that Administrative Consideration, Leadership Opportunities, Equity in Administrative Decisions, Competition, and Social Spaces were the most salient factors that fostered SOC. The results contribute to community building theory and provide practical solutions for enhancing the participant experience.

Warner and Dixon (2013) revisited their findings from their 2011 study in an attempt to understand and uncover the necessary factors for creating a sense of community. In this study they examined and tested SOC within a post-secondary sports club setting (non-varsity competitive sport). Using the same semi-structured interview testing method, the researchers interviewed 21 club sport athletes. The results of the study revealed that Common Interest, Leadership Opportunities, Voluntary Activity, and Competition were the most critical components to creating a sense of community for sports club participants. These results were very similar to their 2011 study which led to the creation of their version of “Sense of Community in Sport Theory” and suggest ways for administrators to improve the student experience. These results confirmed that through the common experience of post-secondary

sports there were commonalities in responses of components that deserved to be investigated further and used to test for community in sport in the future.

Warner and Dixon (2011; 2013) Warner, Dixon, and Chalip (2012) used a grounded theory approach to extend the sport research on sense of community. The authors used interviews and focus groups to examine context specific features in sport that define sense of community in recreational and elite athletes in the collegiate context (i.e., club sport and NCAA college athletes). By completing three separate grounded theory studies, which employed three separate samples the results revealed a new theoretical model with seven factors most prevalent in their research in creating sense of community.

This has provided the necessary basis for 'community' manifestation in sport and has allowed for a new understanding of sense of community in sport using Warner et al's (2013) new theoretical framework.

Figure 1: Sense of community in sport factors (Warner et al. 2013)



Numerous studies have been completed using research tools that provided consistent and insightful results about sense of community, suggestions for the development of a new tool began to emerge (Warner, 2012; Dixon & Warner, 2012). The rationale for the creation of a new tool was, “the scales from the education and community psychology literature are clearly not based on the sport experience. Consequently, the development of such a sport-specific scale

should provide more practical insight for sport managers” (Warner, Kerwin, & Walker, 2013, p. 350). This new tool would be used to test sense of community in sport specific situations thereby expanding its validity. Rather than using borrowed theories and measures not grounded in sport that would alienate important features of sport that define community, this new tool encompassed the sports/ recreational ideology, so its true impact could be examined (Warner, Kerwin, & Walker, 2013). Based upon previous research, Warner et al., (2011;2013) worked to develop a tool to measure sense of community in sport specifically based on the “Sense of Community in Sport theory” (Warner & Dixon, 2011; 2013; Warner, Dixon, & Chalip, 2012).

Measuring Sense of Community in Sport

The tool that encompasses a sport/ recreation-specific ideology is the “Sense of Community in Sport Scale” or “SCS” by Warner, Kerwin, and Walker (2013). This scale is a 28-item tool comprised of seven sub-scales (Administrative Consideration, Common Interest, Competition, Equity in Administrative Decisions, Leadership, Social Spaces and Voluntary Action). Refer to Figure 2 for a brief explanation of each sub-scale.

Figure 2: Sense of community in sport factors with definition (Warner et al. 2013)

Factor	Definition
Administrative Consideration	The expression of care, concern, and intentionality of administrators.
Common Interest	Group dynamics, social networking, and friendships that result from individuals being brought together by common interest.
Competition	The challenge to excel against both internal and external rivalries.
Equity of Administrative Decisions	Decisions that demonstrate all community members are treated equal.
Leadership Opportunities	Informal and formal opportunities to guide and direct others in the community.
Social Spaces	A common area or facility in which athletes could interact with one another.
Voluntary Action	Self-fulfilling and self-determining activities resulting from little to no external pressure or incentive.

The SCS (Warner et al., 2013) uses a four-point Likert scale (Not at all True, Somewhat True, Mostly True, Completely True) to determine feelings of participants on the items (Warner et al.). This scale, through its testing, has been purposely built as an instrument to measure sense of

community and extremely important to the examination of sense of community in recreational sport specific situations.

The scale was developed using a three-phase process to test, develop, and assess the sense of community in sport (SCS) instrument. The creators followed the steps outlined by DeVellis (2003) as the basis for item generation and subsequent scale testing. In the first phase, potential items were identified, categorized, and labeled based on prior literature and theory. More specifically, the data used in theory development on sense of community in, and out of, sport provided the foundation for the initial item pool (Chavis, Lee, & Acosta, 2008; Chiessi, Cicognani, & Sonn, 2010; Warner, 2012a; Warner & Dixon, 2011, 2013a; Warner et al., 2012). In the second phase, the researchers completed a confirmatory factor analysis (CFA) to test and refine the factor structure and establish validity evidence and reliability of each dimension. In the third phase of the study, the relationship of each factor was concurrently validated with continued participation, an outcome theorized to have a strong relationship with sense of community (Kellett & Warner, 2011; McCole et al., 2012; Warner, 2012a). Testing items were created after an extensive review of literature searching for sense of community definitions and measures. This was conducted to capture the multidimensionality of the construct. Specifically, the definition of factors within Warner and Dixon's (2011) seven factor model, along with adapted-items outlined in previous research (that fit with the seven-factor model), provided the basis for item generation: (a) Administrative Consideration (Chavis, et al., 2008; Chiessi et al., 2010; Warner & Dixon, 2011), (b) Common Interest (Chavis et al., 2008; Chiessi et al., 2010; Warner & Dixon, 2013), (c) Competition (Kellett & Warner, 2011; Warner & Dixon, 2011, 2013), (d) Equity in Administrative Decisions (Warner & Dixon, 2011, 2013), (e) Leadership Opportunities (Chavis et al., 2008; Peterson et al., 2008; Warner & Dixon, 2011; 2013), (f)

Social Spaces (Chiessi et al., 2010; Warner & Dixon, 2011), and (g) Voluntary Action (Warner & Dixon, 2013). As a result, the initial item pool reflected each underlying factor relevant to sense of community research in the sport context.

When testing their new scale, Warner et al. (2013) recognized after completing a maximum likelihood estimation (MLE) that the goodness-of-fit indicated that the seven-factor (28-item) measurement model did not fit the data presented. The reliability measures of the prelude model including average variance extracted (AVE), construct reliability (GR), and Cronbach's alpha were above the suggested values. However, the overall model fit, and modification indices included in the AMOS output signified an overall lack of fit to the data, and a need for slight model re-specification. The researchers noted during the re-specification phase that the lack of model fit was attributed to one scale dimension (i.e., Voluntary Action). All loadings for this particular dimension were below the suggested cut-off and the reliability alpha was also below the suggested cut point of $\alpha = .70$. The researchers suggested that this poor performance was linked to the sample tested in the original study of youth archery club participants. Parental influence on youth to participate in sport may be such that a participant may not necessarily feel as though they are "voluntarily" involved in their community, but rather may have been coaxed or motivated by their parent or guardian. The authors removed this factor as it was not providing accurate and reliable testing. When analyzing the data, the authors also removed four additional specific items due to factor loadings being lower than a lambda value of .70. Consequently, a 21-item six-factor model was used to perform the analysis of the Archery club data. The authors noted that these changes and the testing of the SCS scale was limited due to testing in a youth sport setting. The research team suggested data from additional sports (i.e., particularly those more team-orientated, interactively dependent, and coach dependent), and age

categories is needed to further strengthen and validate the SCS tool. The examination of post-secondary sport using this tool in its original seven-factor 28-item form will allow for researchers to see the multidimensional nature of sense of community that is created for participants and determine what factors are most essential to the development of community in post-secondary students and if the dimension or items cut in the original study will have different results in a different demographic and sport setting. These items were used to specifically test for participants' perceived sense of community and this tool was used for the current study. The purpose of this pre-test post-test study was to use the Sense of Community in Sport Theory to examine changes in students' perceived sense of community using the SCS scale over the duration of an intramural season.

Conclusion

In conclusion, in the exploration of the impacts of intramural sports participation on post-secondary students' perceived sense of community, the following areas were explored: A brief history of campus recreation/ programs, benefits of campus recreation participation, social benefits of intramural sports, students' perceived sense of campus community, sense of community, and measuring sense of community in sport.

The history section provided a background description of university recreational programs and what factors have led these programs to become the essential part of the university experience they are today. There is much backing in the literature that supports the benefits of campus recreation participation including: health benefits, educational benefits, social benefits and recruitment and retention benefits. Social benefits of intramural sports have been researched greatly and have identified a strong correlation between intramural participation and social benefits. There has also been a strong correlation in the literature between recreational

participation and perceived sense of community that is in need of expanding. Sense of community has been explored historically and through its examination the need for a new testing tool has become evident. The Sense of Community in Sport Theory (Warner & Dixon, 2011; 2013; Warner, Dixon, & Chalip, 2012) provides the theoretical foundation for this study and there is great potential for the use of the “Sense of Community in Sport Scale” (SCS) (Warner et al., 2013) in an intramural setting. This literature guided the study as it has indicated that there is a need to examine the impacts of intramural sports participation on a post-secondary student’s perceived sense of community.

Chapter 3: Methods

Introduction

The purpose of this pre-test post-test study was to examine changes in students' perceived sense of community over the duration of an intramural season. This chapter outlines the methods of this study by describing the following: (i) design, (ii) participants, (iii) ethics, (iv) instrumentation, (v) reliability and validity, (vi) data collection, and (vii) data analysis.

Research Design

This pre-test post-test study examined changes in students' perceived sense of community over the duration of an intramural season. The institution's undergraduate students participating in intramural volleyball were studied using a survey questionnaire assessing demographic information, intramural participation and student's perception of sense of community using the Sense of Community in Sport Scale (SCS) (Warner et al. 2013). The original research plan was to use repeated measures multivariate analysis of covariance (MANCOVA) testing. This testing method allows to control for the effects of one or more covariates from the demographic information section. In this study, this analysis method allowed the researcher to control for sources of variation within multiple variables (Kraska, 2010). This was changed to due to lack of normality in the data. Testing was completed using pre-test/ post-test design with individuals completing the same questionnaire in the first week of an intramural session and during the last week. This testing design was used to explore participants' perceptions of sense of community over the course of their season.

A pre-test/ post-test research design has limited threats to internal validity. The threats most common to pretest–post-test designs include history, maturation, testing effect, instrumentation, and regression to the mean (RTM) (Frey, 2018). These threats mainly caused by

actions of specific participants were controlled as much as possible by researchers through the use of a peer reviewed testing scale in its entirety developed by Warner et al (2013). The pre-test/post-test research design methodology has been recommended by researchers when studying the impact of college experiences on students when identifying that “when at all possible, the most prudent approach would be to consider a pretest–post-test longitudinal design as the research design of choice in estimating the causal influence of any college experience” (Pascarella, Salisbury, Blaich 2013. p. 334). A pre-test post-test research design allows participants to be honest in sharing their feelings at two separate periods of time and allows them to focus on how they feel in that specific testing moment.

Sample Size

The study’s target population was university undergraduate students currently participating in intramural sports at the specific post-secondary institution. Purposive sampling was used in order to target students that are currently participating in intramural sports. One intramural sport was studied in the men’s, women’s and co-ed divisions. Convenience sampling was also used when sampling individuals in the specific sports tested regardless of intramural level of competition (competitive A, competitive B or recreational) as well as gender specificity of the sport (males only, female only or co-ed). When originally planning a sample size for a MANCOVA analysis a few rules should be followed. First, comparisons of fewer groups (i.e., cells) require more participants to maintain adequate power. Second, lower expected effect sizes require more participants to maintain adequate power (Aron & Aron,1999). Third, when using MANOVA/ MANCOVA it is important to have more cases than dependent variables (DVs) in every cell (Morgan, Carmen, Van Voorhis. 2007; Tabachnick & Fidell, 1996). Given a medium to large effect size, 30 participants per cell should lead to about 80% power (the minimum

suggested power for an ordinary study) (Cohen, 1988). Cohen conventions suggest an effect size of .20 is small, .50 is medium, and .80 is large. If, for some reason, minimizing the number of participants is critical, seven participants per cell, given at least three cells, will yield power of approximately 50% when the effect size is .50 (Kraemer & Thiemann, 1987). With the research tool used for this study there are 28 cells (7 factors with 4 questions each) so at minimum the study aimed for a minimum of 196 completed pre-test/ post-test responses. This allowed for a sample size to be gathered from a finite number of intramural participants. However, larger samples more accurately represent the characteristics of the populations from which they are derived (Cronbach, Gleser, Nanda, & Rajaratnam, 1972; Marcoulides, 1993). This encouraged the researcher to gather as many respondents as possible. Upon completion of the data collection phase 147 participants produced usable pre-test and post-test matched questionnaires to form the sample of intramural sport participants for the study. However, due to lack of normality in the data the MANCOVA analysis was abandoned in favour of a non-parametric Wilcoxon signed-rank test.

Intramural Sport Program

The intramural sports program at the specific institution being studied is hosted on campus. The institution states on its website that “Intramurals are ideal for recreational and competitive athletes. A variety of popular men’s, women’s and co-ed sports are offered throughout the Fall, Winter and Spring semesters” (Brock University, 2018). Intramurals are one of the most popular campus activities for students. The institution claims “They are a great way to meet new people and provide an exciting way to stay active and get some exercise” (Brock University, 2018). Individuals who participate in intramural sports program range in age, gender,

and association to the university, including both undergraduate, and graduate students at various stages of their academic studies.

Students examined in this research were participating in the winter session over a six-week period during February and March. Intramurals at this post-secondary institution run during four different sessions:

- Fall – Six-week period (October/ November)
- Fall/Winter - Six-week period (November/ December)
- Winter - Six-week period (February/ March)
- Spring - Six-week period (May/ June)

The winter session consists of 11 sports leagues including: hockey, indoor soccer, inner tube water polo, aquatic intramurals*, sixes volleyball, dodgeball, soccer baseball, doubles badminton, table tennis singles and two one-day tournaments: snow football and march madness basketball. (*consisted of different intramural sports played in the pool each week. Sports included innertube water polo, underwater hockey, water volleyball at the discretion of the league convenor). Many sports leagues are separated by gender (i.e., Men's indoor soccer/ Women's indoor soccer) while others also consist of co-ed sports where both genders play together (e.g. co-ed ice hockey). Several leagues are also split up into different levels of competition to differentiate skill levels of participants and to ensure even play: Comp A (advanced), Comp B (intermediate) and Rec (beginner). Due to registration numbers some leagues only offered one open level of competition. For the purpose of this study, a conversation occurred with the institution's intramural coordinator about the winter session intramurals. The coordinator indicated that one of the most popular sports during this term was sixes Volleyball. The intramural coordinator suggested that these sport leagues were a good representation

historically of the school's intramural population and offered a large number of individuals registered to sample. Sixes Volleyball in the winter term has three-time offerings of Co-Ed, and a time offering each of Men's and Women's only sixes Volleyball. This program had a mixed group of different competitive levels with different gender compositions in so the sample drawn would be reflective of all intramural team participants.

Ethics

This research adhered to the standards of ethical research identified by the Research Ethics Board (REB) at the post-secondary institution where this study took place. Participants received an informed consent form to fill out before completing the questionnaire both in the pre-test (during the first week of their intramural session) and for the post-test (during the last week). The informed consent form informed students of their rights as a research participant and assured them that the study has received ethical clearance from the university's REB and explained their right to withdraw from the study at any time. Upon completion of the questionnaire, participants were given a feedback letter, thanking them for their participation and reminding them that the information they provided is not anonymous but will be kept confidential. The letter also stated that the results of the study will be available to them upon request, by contacting the researcher after a certain date. All data collected was kept in a sealed container immediately upon completion to ensure confidentiality of information provided. Once all of the data was collected from all intramural participants in the pre-test and post-test, it was inputted into the Statistical Package for the Social Sciences (SPSS) 24.0 for analysis. The data was stored electronically, and password protected, as well as backed up on a password protected external computer drive (USB). The data recorded on the paper copies was kept and stored in a locked cabinet and will be for one year after the research has been completed at which point the

data will be deleted electronically, and the paper questionnaires will be shredded. The data collected was not anonymous as individuals were asked to provide their student email for the purpose of matching pre-test and post-test responses.

Instrumentation

The questionnaire used in this study includes questions regarding individuals' reactions and feelings about participation in their intramural sports teams as it relates to sense of community. Students were asked to consider each question carefully and indicate the response they feel reflects their feelings the best at the time of completion. The questionnaire has no "right or wrong" answers to the questions so it is intended that participants draw upon their real experiences they have had as a result of participation in their intramural sports league.

The questionnaire provided to study participants consists of eight sections. The first section includes demographic information from the participant. This information was gathered using a series of check boxes and small fill-in-the-blank questions. Participants were also asked to provide their student email, so their completed pre-test questionnaire could be matched up with their post-test questionnaire completed weeks later.

Sections two through eight of the questionnaires are based upon the Sense of Community in Sport Scale (SCS) by Warner et al. (2013). This scale was used in its entirety and only minorly edited to change the language of the questions to reflect participation in intramural sports from its sports club original form. The scale is a 28-item tool comprised of seven sub-scales: Administrative Consideration, Common Interest, Competition, Equity in Administrative Decisions, Leadership Opportunities, Social Spaces and Voluntary action. Each of the sub-scales are given its own section and consists of four questions using a four-point Likert scale (Not At All True, Somewhat True, Mostly True, Completely True) to determine feelings of participants

on the items. This scale was purposely built to measure sense of community in sport and is very applicable to the examination of sense of community in recreational sport specific situations.

Reliability and Validity

The study used a pre-established scale to measure students' sense of community in both the pre-test and post-test. The SCS (Warner et al., 2013) was used as the measure of perceived sense of community. This scale was purposely built for the task of identifying sense of community in sports after an extensive review of literature of other scales and testing tools. This tool was used in its original 28 question, seven factor form, was not edited in any way other than to change sports club language to reflect participation in intramural sports. When developed, the creators of the scale indicated that future research using the scale studying additional sports (instead of club swimming and club archery), particularly those that are more team-oriented and interactively dependent, would increase the validity of the scale as a whole (Warner et al., 2013).

Data Collection

In order to access this population, the researcher set up a recruitment table where the intramural sport was taking place to distribute the questionnaires and compensation (free sports drink) to the participants. The table was located directly outside the gymnasium where the intramural sport occurred. This method of recruitment was chosen to provide intramural participants a convenient method of participation and increase involvement within the study by going to the site directly. A large sign with the title of the study was hung on the table in order to attract participants to the first week pre-test and attract/prompt individuals to return for the post-test in the last week of the session. The questionnaire took approximately two to three minutes for completion in order to not burden the participant and a free refreshment (e.g., a sports drink) was offered upon completion of the questionnaire as an incentive to participate. The

questionnaires were completed at the table and handed in upon completion. Participants then received the free refreshment as compensation for their participation. Individuals were welcome to come up to the recruitment table before or after their game or at their convenience.

Participants were not be approached during their intramural activity in order to not disrupt the experience or engagement of the activity being played and to ensure the safety of participants by allowing them to focus. Due to the pre-test and post-test design, the same data collection procedures were completed once at the start of the intramural session in the first week and then at the end of the session in the last week. The only difference in collection methods were during the post-test collection, when individuals were asked if they had completed the pre-test and only if they had completed it, they were allowed to start completing the post-test.

Data Analysis

Collected questionnaires were coded and inputted into the Statistical Package for Social Sciences (SPSS) Version 24. The questionnaires were reviewed for appropriateness and accuracy for each question. Visual screening was used to check that all chosen answers corresponded correctly to the number assigned. Pre-test/post-test questionnaires were matched by each student's number to ensure that participants have completed it twice. Questionnaires from a single participant that did not have both a pre-test and a post-test were discarded. SPSS frequency and descriptive statistic checks were run on the data set for each variable to ensure that there were no answers missing in the distributed data. Missing data that exceeds the limit or was classified as an outlier and was replaced with a series mean to remain a randomly distributed data set. Appropriate descriptive statistics based on the level of measurement of the variables were used to report the results from the demographic and SCS scale questions. Cronbach's alphas were used to examine the reliability of the seven factors of the SCS and a repeated measures

MANCOVA testing was intended to be used to examine changes in sense of community between the pre-test and post-test.

Summary

A questionnaire was distributed to intramural sport participants in the first week and last week of their sports program. This questionnaire measured demographic information along with questions regarding individuals' reactions and feelings about participation in their intramural sports team as it relates to sense of community. The questionnaire was sent to the Research Ethics Board (REB) at Brock University, as part of the research ethics application as well as Recreation Services at the specific institution where it was administered to gain permission to be distributed to intramural participants. In order for this study to take place at a post-secondary educational institution, clearance from the REB was granted for administration to occur. When the study received ethics clearance, the questionnaires were distributed at a recruitment table set up at intramural sixes volleyball in the first and last week of the league's season which took place during the winter session (February to March) for participants to complete. All intramural participants in these leagues were welcomed and encouraged to participate in the study before or after their intramural activity. During the study if a student felt the need to discontinue their participation any time during the questionnaire they were allowed to do so, and their responses were discarded. Students were asked to fill out an informed consent form before completing the questionnaire. Once students had completed this they were advised that the questionnaire will take two to three minutes to complete. This process was completed in the pre-test in the first week of the intramural program as well as in the post-test during the last week. Once the data was collected to meet the previously established sample size and matched in pre-test/post-test by participant it was inputted and analyzed using SPSS software with the intention of using a

Multivariate analysis of covariance (MANCOVA) test to examine differences between pre-test and post-test of participants in relation to their perceived sense of community. This allowed the researchers to answer the research questions and draw conclusions about the impact of intramural sports participation on students' perceived sense of community.

Chapter 4: Findings

Data Analysis

This chapter provides the results generated from the data analysis to answer the research questions of this study. Multiple analyses were conducted using the data obtained from the questionnaires completed for this study. The main analysis was intended to be a repeated measures multivariate analysis of covariance (MANCOVA) procedure to determine the relationship between the dependent variables of the pre and post-test 28-question Sense of Community in Sport Scale (Warner et al., 2013) data with the independent variables of gender, year at institution, post- secondary (years), ethnicity, residence, intramural division and level of play. When the data was examined, and preliminary testing procedures were completed, the data violated assumptions of the repeated measures MANCOVA as well as basic paired sample T-tests as the data was not normally distributed. The combined pre-test post-test data was then analyzed using the non-parametric Wilcoxon signed-rank test.

Data Screening

A total of 326 pre-test questionnaires were collected. Of those questionnaires, fourteen were discarded due to incompleteness or answering all 28 questions as 4 “completely true”. There was one withdrawal from the study and two duplicate surveys completed by participants. When these surveys were removed from the data set the total number of questionnaires used for analysis was 309. To screen the data for accuracy, questionnaires were reviewed at random throughout the dataset to ensure that data was inputted into SPSS correctly. The data was visually screened as well as run through frequencies and descriptive statistics with SPSS, looking for incorrectly inputted data that would create obvious outliers within the data set. Where errors occurred within the data, proper corrections were made referring back to the hard copy of the

questionnaire itself. For the post-test, 175 questionnaires were collected and of these questionnaires 13 were discarded due to incompleteness or answering all 28 questions as “4” or “completely true” in an attempt to complete the survey rapidly. When these surveys were removed from the data set the total number of questionnaires used for analysis was 162 which were matched with their pre-test. From these 162 matched surveys, 15 participants were graduate students which were removed leaving the matched sample size at 147. From the inspection of data and screening process there were a number of missing responses randomly distributed throughout the sample collected. Where missing values were identified within the data set, a series mean was used to replace the missing data. For the nominal and ordinal level variables of the demographic characteristics of the participants, a series mean was not inputted for these variables as the number represented a category rather than an actual numerical value and a series mean would not be correctly representative for that specific variable. Therefore, the descriptive statistics reported for demographic characteristics do not contain a series mean, the number of missing cases is reported when necessary.

Background Demographics

The descriptive statistics of the demographic characteristics revealed that 67.6% (n=98) were males and 32.4% (n=47) were female. The average age of the participants was 20 years old (M=19.95, SD= 1.88). Of these students, 38.8% (n=57) reported to be in their first year at the institution, 15.0% (n=22) in their second year at the institution, 25.2% (n=37) in their third year at the institution, 14.3% (n=21) in their fourth year at the institution, and 5.4% (n=8) to be in their fifth year or higher of education at the institution, with 1.4% (n=2) missing. On average it was participants’ second year of post-secondary education (M=2.32, SD=1.37). In terms of ethnicity, the majority of participants were White (80.3%, n=118) while 1.4% were Metis (n=2),

2.7% (n=4) were Chinese, 2.7% (n=4) were South Asian, 2.7% (n=4) were Black, 0.7% (n=1) were Filipino, 0.7% (n=1) were Latin American, 0.7% (n=1) were Southeast Asian, 0.7% (n=1) were West Asian, 0.7% (n=1) were Japanese, 0.7% (n=1) were Korean and 0.7% (n=1) were missing. Students also identified other ethnicities/ combinations of ethnicities that were < 5.0% of the sample size. Please refer to Table 3 for a further breakdown.

Furthermore, 38.1% (n= 56) of participants live on-campus, 52.4% (n=77) live off-campus, and 8.2% (n=12) live at home, with 1.4% (n=2) missing. For Intramural division 81.6% of participants were Co-Ed (n=120), 12.2% were Men's (n=18) and 5.4% were Women's (n=8), with 0.7% missing (n=1). In terms of divisions and level of competition 25.2% of participants were in the Recreational division (n=37), 31.3% in the Competitive A division (n=46) and 42.2% were in the Competitive B division (n=62), with 1.4% missing (n=2)

Table 1: Frequencies for Gender and Age

Characteristics	N	%
<i>Gender</i>		
Male	98	66.7
Female	47	32.0
Missing	2	1.4
<i>Age (years)</i>		
18	39	26.5
19	27	18.4
20	32	21.8
21	24	16.3
22	13	8.8
23	6	4.1
24	2	1.4
25	1	.7
26	0	0
27	0	0
28	1	.7
29	1	.7
Missing	1	.7

Table 2: Frequencies for Year at Institution and Years at Brock

Characteristics	N	%
<i>Year at Institution</i>		
First Year	57	38.8
Second Year	22	15.0
Third Year	37	25.2
Fourth Year	21	14.3
Fifth Year/Higher	8	5.4
Missing	2	1.4
<i>Years at Brock</i>		
0	3	2.0
0.5	3	2.0
1.0	54	36.7
1.5	1	.7
2.0	21	14.3
2.5	2	1.4
3.0	30	20.4
3.5	1	.7
4.0	21	14.3
4.5	0	0
5.0	6	4.1
5.5	0	0
6.0	2	1.4
Missing	3	2.0

Table 3: Frequencies for Ethnicity and Place of Residence

Variables	N	%
<i>Ethnicity</i>		
White	188	80.3
Metis	2	1.4
Chinese	4	2.7
South Asian	4	2.7
Black	4	2.7
Filipino	1	1.7

Latin American	1	.7
Southeast Asian	1	.7
West Asian	1	.7
Japanese	1	.7
Korean	1	.7
White/ Black	2	1.4
Chinese/ Mauritian	1	.7
White/ NA Indian	1	.7
Black/ Southeast Asian	1	.7
Filipino/ Latin American	1	.7
Caribbean	1	.7
Chinese/ Black	1	.7
Missing	2	.7
<i>Residence</i>		
On-Campus Living	56	38.1
Off-Campus Living	77	52.4
Home	12	8.2
Missing	2	1.4

Table 4: Frequencies for Intramural Sports Division

Characteristics	N	%
<i>Intramural Division</i>		
Co-Ed	120	81.6
Men's	18	12.2
Women's	8	5.4
Missing	1	.7
<i>Level of play</i>		
Recreational	37	25.2
Competitive A	46	31.3
Competitive B	62	42.2
Missing	2	1.4

Pre-test SCS Factors

The SCS (Warner et al., 2013) uses a four-point Likert scale system for its questions (Not at all True 1, Somewhat True 2, Mostly True 3, Completely True 4) to determine participant responses to the items.. This scale is a 28-item tool comprised of seven sub-scales

(Administrative Consideration, Common Interest, Competition, Equity in Administrative Decisions, Leadership, Social Spaces and Voluntary Action). For the pre-test, on average participants for all 28 questions responded with “Mostly True” with mean scores all above three. The only exception was for question 15 with a mean of 2.8.

All skewness and kurtosis values reported for the pre-test SCS scale do not meet the assumptions of a normal distribution between -1 and 1 other than questions 10 and 15. Question ten indicates skewness value of (-0.807) making it negatively skewed and has a kurtosis value of (-0.447) making it platykurtic. Question twelve indicates a skewness value of (-0.735) making it negatively skewed and has a kurtosis value of (-0.819) making it platykurtic. Refer to Table 5 for further statistics on the pre-test SCS Scale.

Table 5: Pre-Test SCS Scale

Factors / Statements	<u>M</u>	<u>SD</u>	<u>Skewness</u>	<u>Kurtosis</u>
Administrative Consideration ($\alpha = .787$)				
1. Leaders of my Intramural Team care about other members	3.80	.47	-2.26	4.52
2. Leaders of my Intramural Team support other members	3.80	.45	-2.21	4.29
3. I feel comfortable talking openly with the Leaders of my Intramural Team	3.79	.49	-2.64	8.46
4. The leaders make me feel like a valued member of my Intramural Team	3.81	.41	-1.94	2.67
Factors / Statements	<u>M</u>	<u>SD</u>	<u>Skewness</u>	<u>Kurtosis</u>
Common Interest ($\alpha = .775$)				
5. I share similar values with other members in my Intramural Team	3.77	.44	-1.52	0.99
6. I feel like I belong in my Intramural Team	3.83	.38	-1.77	1.16

7. My Intramural Team provides me with friends who share a strong commitment to Intramurals	3.80	.48	-2.36	4.92
8. I trust the members of my Intramural Team	3.78	.45	-1.83	2.47
Factors / Statements	<u>M</u>	<u>SD</u>	<u>Skewness</u>	<u>Kurtosis</u>
Competition ($\alpha = .309$)				
9. I feel a bond with other members of my Intramural Team when we're competing against others	3.69	.56	-1.90	3.96
10. I like the level of competition with other Intramural Teams	3.45	.66	-0.81	-0.45
11. Competing with other teams with my Intramural Team is fun	3.77	.45	-1.79	2.30
12. There is too much competition between other teams and my Intramural Team	3.03	1.1	-0.73	-0.82
Factors / Statements	<u>M</u>	<u>SD</u>	<u>Skewness</u>	<u>Kurtosis</u>
Equity of Administrative Decisions ($\alpha = .347$)				
13. Leaders in my Intramural Team make decisions that benefit everyone	3.62	.57	-1.45	2.46
14. Leaders in my Intramural Team make decisions that are fair	3.70	.52	-1.78	4.18
15. The decisions made by leaders in my Intramural Team favor some members over others	2.81	1.26	-0.41	-1.53
16. Leaders in my Intramural Team consider everyone's needs when making decisions	3.60	.59	-1.40	1.98
Factors / Statements	<u>M</u>	<u>SD</u>	<u>Skewness</u>	<u>Kurtosis</u>
Leadership Opportunities ($\alpha = .789$)				
17. I have influence over what my Intramural Team is like	3.34	.77	-1.05	0.71
18. If there is a problem in my Intramural Team, I can help to solve it	3.63	.59	-1.56	2.46
19. I have a say about what goes on in my Intramural Team	3.58	.65	-1.45	1.51
20. Being a member of my Intramural Team gives me opportunities to lead	3.59	.62	-1.23	0.46

Factors / Statements	<u>M</u>	<u>SD</u>	<u>Skewness</u>	<u>Kurtosis</u>
Social Spaces ($\alpha = .796$)				
21. When going to an Intramural game or practice, there are places where I can interact with other teammates	3.71	.51	-1.57	1.59
22. When going to an Intramural game or practice, I know I'll have an area where I can interact with other teams	3.66	.59	-1.75	3.00
23. Intramural practices and competitions create a place for me to interact with other teams	3.67	.55	-1.47	1.25
24. My Intramural Team provides me a place to interact with other teams	3.74	.50	-1.77	2.33
Factors / Statements	<u>M</u>	<u>SD</u>	<u>Skewness</u>	<u>Kurtosis</u>
Voluntary Action ($\alpha = .066$)				
25. I am a part of my Intramural Team because I want to be	3.88	.34	-2.91	8.20
26. Participating in Intramurals never feels like a chore (or job)	3.37	1.07	-1.47	0.56
27. I participate in Intramurals because of pressure from my family or friends	3.33	1.15	-1.29	-0.11
28. I am not forced to be a member of my Intramural Team	3.54	.99	-2.00	2.41

Post-test SCS Scale

The post-test used the same SCS scale as the pre-test under the same conditions. When examining the distribution of scores for the post-test data, all skewness and kurtosis values reported for the post-test SCS scale do not meet the assumptions of a normal distribution between -1 and 1 other than question 12. There is too much competition between other teams and my Intramural Team with a skewness of $-.547$ and question 15. The decisions made by leaders in my Intramural Team favor some members over others with a skewness of $-.198$. When examining Kurtosis questions 26 and 27 both have values that are normally distributed with

values of 0.429 and -0.400 respectfully. Refer to Table 6 for further statistics on the post-test SCS Scale.

Table 6: Post-Test SCS Scale

Factors / Statements	<u>M</u>	<u>SD</u>	<u>Skewness</u>	<u>Kurtosis</u>
Administrative Consideration ($\alpha = .826$)				
1. Leaders of my Intramural Team care about other members	3.82	.42	-2.27	4.56
2. Leaders of my Intramural Team support other members	3.81	.44	-2.28	4.67
3. I feel comfortable talking openly with the Leaders of my Intramural Team	3.80	.50	-2.78	8.87
4. The leaders make me feel like a valued member of my Intramural Team	3.84	.39	-2.19	3.88
<hr/>				
Factors / Statements	<u>M</u>	<u>SD</u>	<u>Skewness</u>	<u>Kurtosis</u>
Common Interest ($\alpha = .766$)				
5. I share similar values with other members in my Intramural Team	3.78	.46	-1.94	3.01
6. I feel like I belong in my Intramural Team	3.80	.45	-2.13	3.93
7. My Intramural Team provides me with friends who share a strong commitment to Intramurals	3.76	.49	-1.92	2.97
8. I trust the members of my Intramural Team	3.75	.49	-1.82	2.54
<hr/>				
Factors / Statements	<u>M</u>	<u>SD</u>	<u>Skewness</u>	<u>Kurtosis</u>
Competition ($\alpha = .378$)				
9. I feel a bond with other members of my Intramural Team when we're competing against others	3.79	.44	-1.90	2.79
10. I like the level of competition with other Intramural Teams	3.57	.71	-1.57	1.72
11. Competing with other teams with my Intramural Team is fun	3.71	.52	-1.65	1.87

12. There is too much competition between other teams and my Intramural Team	2.87	1.2	-.55	-1.21
Factors / Statements	<u>M</u>	<u>SD</u>	<u>Skewness</u>	<u>Kurtosis</u>
Equity of Administrative Decisions ($\alpha = .541$)				
13. Leaders in my Intramural Team make decisions that benefit everyone	3.63	.59	-1.35	0.82
14. Leaders in my Intramural Team make decisions that are fair	3.63	.62	-1.83	3.67
15. The decisions made by leaders in my Intramural Team favor some members over others	2.65	1.32	-.20	-1.74
16. Leaders in my Intramural Team consider everyone's needs when making decisions	3.64	.58	-1.59	2.59
Factors / Statements	<u>M</u>	<u>SD</u>	<u>Skewness</u>	<u>Kurtosis</u>
Leadership Opportunities ($\alpha = .822$)				
17. I have influence over what my Intramural Team is like	3.47	.69	-1.18	1.14
18. If there is a problem in my Intramural Team, I can help to solve it	3.71	.53	-1.61	1.74
19. I have a say about what goes on in my Intramural Team	3.61	.70	-1.85	3.09
20. Being a member of my Intramural Team gives me opportunities to lead	3.67	.62	-2.08	4.45
Factors / Statements	<u>M</u>	<u>SD</u>	<u>Skewness</u>	<u>Kurtosis</u>
Social Spaces ($\alpha = .833$)				
21. When going to an Intramural game or practice, there are places where I can interact with other teammates	3.71	.51	-1.52	1.43
22. When going to an Intramural game or practice, I know I'll have an area where I can interact with other teams	3.69	.58	-1.97	3.84
23. Intramural practices and competitions create a place for me to interact with other teams	3.70	.57	-1.76	2.11
24. My Intramural Team provides me a place to interact with other teams	3.68	.57	-1.66	1.77
Factors / Statements	<u>M</u>	<u>SD</u>	<u>Skewness</u>	<u>Kurtosis</u>

Voluntary Action (α =.087)

25. I am a part of my Intramural Team because I want to be	3.88	.37	-3.11	9.72
26. Participating in Intramurals never feels like a chore (or job)	3.36	1.10	-1.44	0.43
27. I participate in Intramurals because of pressure from my family or friends	3.28	1.20	-1.20	-0.40
28. I am not forced to be a member of my Intramural Team	3.74	.72	-3.10	8.91

To evaluate the reliability of each scale and construct within the questionnaire, Cronbach's alpha was calculated for both the pre-test and post-test grouping factors. Each factor needs to obtain an alpha level of 0.7 or greater to meet the minimum standard criteria for acceptability (Tabachnick & Fidell, 2007). Field (2013) discusses Kline's (1999) theory that when dealing with psychological constructs such as sense of community, alpha values below 0.70 can be expected due to the diversity of the constructs being measured. The following factors measured have acceptable alpha scores Pre-test factors: Administrative Consideration (α =.783), Common Interest (α =.775), Leadership Opportunities (α =.789) and Social Spaces (α =.796) and Post Test factors: Administrative Consideration (α =.826), Common Interest (α =.766), Leadership Opportunities (α =.822) and Social Spaces (α =.833). making all these factors in the scale reliable. The other factors in both the pre-test set and post-test data set did not have alpha's of <0.7 making them unreliable.

Table 7: Pre-test / Post-test Results

Factors	Pre-test		Post-test		Change Post minus Pre
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	
Administrative Consideration	3.8194	.32582	3.8163	.35516	-0.0031
Common Interest	3.7931	.33894	3.7757	.35927	-0.0174
Competition	3.4839	.41899	3.4844	.45344	0.0005
Equity of Administrative Decisions	3.4312	.48778	3.3846	.54609	-0.0466
Leadership Opportunities	3.5370	.51394	3.6139	.51371	0.0769
Social Spaces	3.6973	.42426	3.6986	.45573	0.0013
Voluntary Action	3.5833	.45612	3.5694	.43997	-0.0139

Data Analysis

A Wilcoxon signed-rank test was completed using the seven SCS scale factors from the pre and post test data. This non-parametric test was used as it is useful during situations where there are two sets of scores to compare but from the same participants but in a situation where other test cannot be used due to the assumptions being broken (Field, 2013). The test revealed that there were no significant relationships between any of the pre-test factors and their matching post-test factors. For the variable of Administrative Consideration there was no statistical significance between levels of sense of community between the pre-test (Mdn = 4.0) and post-test (Mdn = 4.0, $t = 1073.50$, $p = .821$, $r = 0.013$). For the variable of Common Interest there was no statistical significance between levels of sense of community between the pre-test (Mdn = 4.0) and post-test (Mdn = 4.0, $t = 1281.50$, $p = .701$, $r = -0.022$). For the variable of Competition there was no statistical significance between levels of sense of community between the pre-test (Mdn = 3.5) and post-test (Mdn = 3.5, $t = 2267.0$, $p = .961$, $r = 0.003$). For the variable of Equity in Administrative Decisions there was no statistical significance between levels of sense of community between the pre-test (Mdn = 3.5) and post-test (Mdn = 3.25, $t = 1333.0$, $p = .291$, $r = -0.064$). For the variable of Leadership Opportunities there was no statistical significance between

levels of sense of community between the pre-test (Mdn = 3.75) and post-test (Mdn = 3.75, $t = 2203.00$, $p = .097$, $r = 0.122$). For the variable of Social Spaces there was no statistical significance between levels of sense of community between the pre-test (Mdn = 4.0) and post-test (Mdn = 4.0, $t = 1413.00$, $p = .890$, $r = 0.008$). For the variable of Voluntary Action there was no statistical significance between levels of sense of community between the pre-test (Mdn = 3.75) and post-test (Mdn = 3.75, $t = 607.50$, $p = .596$, $r = -0.031$). The indication of positive and negative differences by factor can be seen in table 8.

Table 8: Differences by factors

Factors	Positive Differences	Negative Differences	Ties
Administrative Consideration	37	27	80
Common Interest	35	38	71
Competition	48	47	42
Equity of Administrative Decisions	35	43	58
Leadership Opportunities	50	35	57
Social Spaces	41	33	72
Voluntary Action	24	27	93

Summary of Findings

The intention of the data analysis was to complete a repeated-measures multivariate analysis of covariance (MANCOVA). However, when the data was examined, and preliminary testing procedures completed, the data violated assumptions of basic paired sample T-tests as well as MANCOVA tests due to the data not being normally distributed. Both the pre-test and post-test data sets independently had very high levels of community as determined by the SCS tool. The combined pre-test/ post-test data was then analyzed using the non-parametric Wilcoxon

signed-rank test. The test revealed that there were no significant differences between any of the pre-test factors and their matching post-test factors.

Chapter 5: Conclusion

This pre-test post-test study examined changes in students' perceived sense of community in sport over the duration of an intramural season. Warner and Dixon's (2013) Sense of Community in Sport (SCS) Theory was used throughout this study as a conceptual framework guiding the research. Taking its survey design from the compilation of previous sport research scales, the SCS scale was intentionally developed for testing sport clubs and groups allowing researchers to gather data about participants' feelings of community within their sports groups

Since the data was not normally distributed and given there were only minimal changes in students' sense of community in sport from pre-test and post-test non-parametric tests were used in place of their parametric counterparts. This chapter examines the findings of this study and relates them to previous literature and research that shaped the direction and intention of this study.

Background demographics

The demographic characteristics of respondents were consistent with previous research studying intramural sports participation at similar sized post-secondary institutions. Similar to the study by Power and Forrester (2017), the sample population was predominantly first and second year students rather than third, and fourth, year students. The sample group consisted of 60% males and 40% female students with almost all in undergraduate studies. The average reported year of study was second year for students with the majority of students (80%) identifying their ethnicity as "White". The sample in this study, like that of Power and Forrester was comprised of almost two thirds of students living off-campus. Participants were almost evenly spread throughout the three intramural divisions with most participating in Co-Ed competition which is representative of the intramural volleyball registration demographics. Due

to registration numbers in the league the recreational division at times was not run and all teams were put into competition B to ensure an appropriate number of teams to allow the league to run.

Pre-test

The data returned from participants sense of community in sport (SCS) Scale (Warner, Kerwin, & Walker, 2013) indicated that participants had very high feelings of sense of community at the time of competition. Throughout the seven factors and twenty-eight questions from the SCS Scale the mean scores sat at the agree and strongly agree level for every question other than the negatively coded ones which mean scores were at the opposite disagree and strongly disagree responses. The data indicated that survey respondents had even higher levels of sense of community than participants in the original SCS study test (Warner, Kerwin & Walker). When originally tested, and examined focusing on sports clubs, the SCS scale was used at a single point of time with participants. The factors mean scores in this study in both in the pre-test and post-test were equal to or greater than their variable counterparts in the original study demonstrating significantly high levels of sense of community in sport for participants in this study.

Post-test

The post-test data from the second SCS scale completed was extremely similar to the pre-test. Similar to the pre-test, participants responded with very high answers for all of the questions which again indicates very high feeling of sense of community from participants of the study for a second point in time. When drawing comparisons to the original SCS scale tested by Warner, Kerwin and Walker (2013) on archery club participants there are some unique points that could be made. The data presented in the pre-test and post-test in this study was taken from intramural sport participants. These participants differ than the original study's archery club group in the

possibility that participants on the intramural sports teams in this study likely had relational histories with one another spanning from one semester to as many as four years or more for the upper year students. This differs from the original study's participants in how they were all potentially individuals with no relational history prior to joining the archery club. This difference may indicate why there were high perceptions of sense of community found in both the pre-test and post-test in this study.

Non-parametric design model Wilcoxon signed-rank test

When the pre-test and post-test SCS data was compared there were interesting points made. Firstly, the initial plan of analysis to complete a Repeated Measures Multiple Analysis of Co-Variance (MANCOVA) was stopped promptly due to high mean scores from participants. For each question and factor the data was so consistently skewed and high it was simply not normally distributed leading to assumptions to be broken immediately. The secondary plan to complete a non-parametric test revealed that the data set were almost identical despite being taken six weeks apart. This indicates that there was not a significant change testing factors mean score ranks between the pre and post-test. This finding demonstrates that there was not a significant difference in participants perception of sense of community but rather participants had high perceived feelings of sense of community both times they were tested.

This study's findings of high perceived feelings of sense of community is consistent with previous research on recreational/intramural sports and participants perceived sense of community. Elkins et al. (2011a) and Elkins et al. (2011b) in their examination of how involvement in out-of-class activities influenced students' perceived sense of campus community concluded that students with higher levels of participation in certain campus involvement areas such as campus recreation had significantly higher perceived sense of campus community within

the following testing factors of: teaching and learning, history and tradition, diversity and acceptance, residential experience, and loneliness and stress. The researchers also suggested that participation in campus recreational sports significantly predicted students' perceived sense of campus community within the studies questionnaire's diversity and acceptance factor. In addition, in their research those students who participated in campus recreational sports perceived a greater sense of campus community based on the residential experience factor when compared with those students who did not participate. This previous research compliments the current findings of this study as it indicates that involvement in campus recreational sport can be linked to higher perceptions of sense of campus community and provides reasons as to why participants would indicate high perceptions of community at two points of time.

Limitations

Various elements of this study may limit validity of the data collected and presented, as some limitations related to internal sources of the design of the study and questionnaire, where others were related to the external components involved relating to the generalizability of the data collected. The subsequent sections outline both the internal and external limitations of this study.

Internal: Research Design

As indicated in chapter one, a limitation of this study is simply the use of its survey design. The SCS scale used has pre-determined answers through its four-point Likert scale. This scale type forces participants to pick a response and does not allow for the participant to indicate exactly how they are feeling. Having no open-ended questions in the survey, the ability for students to expand on their answers/ feelings is greatly reduced which could allow the researcher to elaborate on the chosen answer. The design and delivery of the SCS survey was a limitation

faced by the study. The SCS scale by design is a 28 question, seven factor survey with four-point questions (Not at all true, Somewhat true, Mostly true and Completely true) used in a pre-test post-test system. Using a four-point scale limited participants to very broad categories making it very hard to detect changes from the pre-test to post-test. This limitation is compounded when the pre-test post-test design is considered. Response shift bias occurs when participants completing the pre-test have a lack of knowledge or idea of what the program is targeting and unintentionally overestimate their responses. Once completing the program may show participants that they actually knew less than they originally thought when they completed the pre-test. The pre-test, post-test comparisons can be misleading because participants have a different frame of reference after participating in the program that they did before (Marshall, Higginbotham, Harris, & Lee, 2007). This can limit the SCS scale as a particular factor or question could be answered by a participant high in the pre-test not knowing though the experience of the intramural season and how they truly felt about it. Then once the post-test was administered the frame of mind of the participant may have shifted resulting in numerically a similar response but not seeing the changes in the participants' feelings.

Additional limitations of this study were linked to data collection and distribution of surveys. Using purposive sampling, students were targeted by being participants in intramural volleyball in the winter term. Convenience sampling was also used when sampling individuals in the volleyball league regardless of intramural level of competition (competitive A, competitive B or recreational) as well as gender specificity of the sport (males only, female only or co-ed). Although two types of sampling were used, due to the registration and composition of the league there was the potential that a disproportionate number of males, females or even participants in a specific level of play could have completed the study resulting in a sample that was not

completely random creating the chance of type 1 error (Tabachnick & Fidell, 2007). All questionnaires were distributed on an institution's campus property to the intramural participants as dictated by ethics.

Another limitation of this study was the use of a non-parametric design model. Although necessary due to the non-normal distribution of the data, the non-parametric design model did not allow for other variables to be taken into account when testing. Comparisons could only be made from matching pre-test and post-test factors.

A final limitation that can be discussed is the testing intramural program itself. Participants in the winter intramural volleyball session were tested for this study which can cause a few limitations to occur. Being tested in the winter, rather than the fall session, participants would have been in school for at least four months. This time in school may have already affected participants sense of community especially if they played one or more fall intramural sports. The winter term of intramural volleyball was six weeks long. With one game a week and pre-testing on the first week and post-testing on the last week, teams may have only had six hours or so of time together. This is not a long time for changes in group dynamic to occur in some cases and experiences may have been limited especially if participants missed weeks of the season. In some cases, six weeks may have not been enough time to see an increase in feelings of sense of community for participants. The reverse of this also may be true. Individuals in upper years may have already benefitted from their campus experience and could have already established perceptions and feelings of community. The team itself may have also been a limitation to the study. Students may have had already elevated levels of community with the teams they signed up to play with. Being in the second term students may have signed up with a friend group for intramurals that they either knew from previous years or met in their first

semester before. This may have caused overly high levels of sense of community in the pre-test as participants considered their pre-existing relationships or a lack of change in the post-test as participants feel their group dynamic is exactly the same.

To control threats to internal validity the research team prompted individuals completing the study to answer the survey based on their current feelings about their intramural experience. In both the pre-test and post-test, the researchers followed the same procedure and script in an attempt to keep both points of testing under the same conditions.

External: Generalizability

The sample population for this study was collected at one university from one specific intramural volleyball term. This may reduce the generalizability of the results. The results may not be generalizable to other campuses due to differences in each school's student population and programs. Another threat to the generalizability of the study is related to the high majority of study participants indicating that their ethnicity is "white". While reflective of the broader student population at the institution where this study occurred, this high majority of Caucasian students in this institution's intramural programs may not be generalizable to larger schools with a more ethnically diverse student population in larger urban areas.

Implications for theory

This study supports the findings of previous research which has found that those students who are involved in recreational sports in a post-secondary environment receive both perceived feelings of sense of community but also relationship building opportunities and experiences (Henchy, 2011; Power & Forrester, 2017; Sturts & Ross, 2013). The results of this study are also congruent with other trends identified in previous research identifying the social benefits that can come from campus recreational programs and facilities offered to students (Artinger, Clapham,

Hunt, Meigs, Milord, Sampson & Forrester, 2006). If recreational programs and services are used the benefits are high and can directly affect a student's post-secondary experience.

Although the results of this study do not indicate that intramural sports participation leads to perceptions of sense of community to increase in students the results affirm the previously held literature and theoretical background that involvement in on-campus activities can provide benefits to the participant.

When examining the previous literature in comparison to the results of this study there are some comparisons to be made on how this study fits in the study of campus community.

The first point of comparison that can be made is between the original SCS tool creation study (Kerwin et al., 2013) and the current research. In the original study the SCS scale was used to test youth in archery and swim clubs at one period of time. When examined, the results of the original study yielded a valid and reliable instrument to measure sense of community in sport but also a correlation between participation in recreational sport in levels of sense of community. The research team suggested data from additional sports (i.e., particularly those more team-orientated, interactively dependent, and coach dependent), and age categories are needed to further strengthen and validate the SCS tool. When the SCS scale in this current study was administered at two points in time in this pre-test/post-test design the results indicated that although there was not significant change between the pre-test and post-test there was high levels of perceived sense of community by participants indicated at two periods of time. When compared to the original SCS study the current study results showed higher mean scores on all of the SCS factors other than Equity of Administrative Decisions on both the pre and post-test demonstrating that in this study those who participated in intramural sports had on average higher perceived levels of sense of community when participating in intramural sports at two

points in time in this study than those who participated in archery and swimming clubs sport in the original study.

The SCS scale was also tested in a military environment (Pollock, 2018). In this study, active duty Canadian Forces personnel were given the SCS scale to reflect on recreation participation and sense of community as it relates to military recreation programs and services. When comparing the current study and the military based study both the pre-test and post-test in this current study had higher mean scores on average for all of the seven SCS factors indicating that those who participate in campus intramural sport in this study on average have higher perceptions of sense of community than those who participate in recreation in the workplace in a military base environment.

These two studies comparisons are interesting as it contextualizes the results of this current study as they were all tested using the SCS scale (Kerwin et al, 2013). The similar testing methodology allows for greater comparisons and contrasts to be made between the studies. When examining the current study with its higher factorial mean scores it indicates that perceptions of sense of community tested in a post-secondary intramural sport situation are greater than perceptions of sense of community in club sport and on a military base. This is an intriguing result as it poses questions as to what in the post-secondary intramural environment may have caused these greater scores for future research.

The second point of comparison that can be made with the results of this current study and previous research completed focused on perceptions of campus community at post-secondary institutions. When examining the findings of high levels of perceptions of community in intramural sport in both the pre and post-test there are similarities that are consistent with previous research. Studies, such as Elkins et al. (2011a), examined how involvement in out-of-

class activities influenced students' perceived sense of campus community. The results of this study indicated students with higher levels of participation in certain campus involvement areas (i.e., Campus recreation, Community service, Clubs, Faith based activities, and Intercollegiate activities) had significantly higher perceived sense of campus community. These findings support the current study's results that a campus recreation activity such as intramural volleyball would be an ideal environment for perceptions of community to test high as intramural sports fall under campus recreational activities. There are also similarities between this study and findings of previous research when compared to campus recreational involvement and perception of campus community. Research, such as Elkins et al. (2011b), which examined the degree to which involvement in campus recreational sports programs is associated with students' perceived sense of campus community suggested that participation in campus recreational sports significantly predicted students' perceived sense of campus community and within the studies questionnaire's diversity and acceptance factor. In addition, those students who participated in campus recreational sports perceived a greater sense of campus community based on the residential experience factor when compared with those students who did not participate. Phipps et al (2015) also investigated the relationship between intramural sports participation and sense of community among college students and concluded that students who participated longer in intramural sports experienced higher levels of sense of community. Also, Power and Forrester (2017) who examined the relationship between participation in intramural sports and social integration into the campus community. The researchers found that the quality of intramural participation, consisting of the effort, time, and money a student invests, significantly predicted social integration into the campus community. These findings compliment the current research as

they support the findings of intramural sports participants having high perceptions of a sense of community and add validity to this occurrence.

Implications for practice

The conclusions drawn from this study should be taken into consideration by various campus recreational sport professionals including; intramural coordinators, community programmers, sport practitioners, etc. Although the results of this study did not indicate a positive change in participants' perceptions of community over the course of a six-week intramural season, it did indicate participants on average had high perceptions of sense of community at both the first and last week of the intramural season. When the literature is taken back into consideration it is well shown that having a perception of sense of community is an integral and beneficial part of a student's post-secondary experience. The finding of high perceptions of sense of community at two points of time in an intramural program in this study is a catalyst for change and encourages professionals both in athletics and student life to motivate students to participate and engage in these programs as it can be an aid to link students to their post-secondary environment and experience along with the additional numerous benefits campus recreation provides.

In addition to being taken into consideration by campus recreational sport professionals there are specific implications for practice for university recruitment officers. The results of this study indicated that students that participated in recreational sports had high perceptions of sense of community at two points of time. This is important for recruitment officers as it can be used as a selling feature and recruitment tool. In an ever-competitive post-secondary schooling market battling with a declining North American student population post-secondary institutions are looking to get as many students as possible to register with their school. By understanding that

students that participated in intramural sports had high perception levels of sense of community recruitment officers can use the results of this study as a selling feature of their recreational sports programs to prospective students. By sharing the results of this study recruitment departments can offer prospective students an incentive beyond just their physical participation in intramural sports and assist in making students feel like they know they will have the opportunity to feel community long before they arrive for their first day. This will assist in student's choice of their post-secondary institution making their decision far easier.

Along with recruitment the results of this study have implications on student retention for post-secondary institutions. Intramural programs have previously been linked to higher retention rates for students (Forrester, McAllister-Kenny, & Locker, 2018). By having data to indicate the high perceptions of sense of community from intramural participants this study will act as an aid to post-secondary officials as they look to develop strategies to keep students in their institutions. By understanding that participants have high feelings of sense of community and that sense of community has previously been linked to retention and overall happiness of students (Miller, 2011) administration should consider the removal of barriers of access to these programs and leagues such as cost and off peak programming time as they have an important and undeniable impact on the students who participate in them.

Future research recommendations

Further suggestions for future research would be to continue studying perceptions of sense of community and to explore other areas of a campus community, such as; clubs, varsity sports teams, events, etc. Through studying other areas of a campus community there would be the ability to indicate if there are differences or similarities between feelings of sense of community by specific programs. This would allow administrators to see which programs and

services should be marketed and pushed to students to benefit them as well which programs and services should be revised to enhance their potential to assist in the creation of community for participants.

Although this study did not indicate a change in participants perceptions of sense of community over the course of an intramural season it did indicate extremely almost identical high perceptions of sense of community at two points in time. This poses the question was six weeks really enough time to see change? Future research should focus upon longer term studies of participants in campus recreational activities to isolate and examine any potential effects specific programs and services have. Looking at a post-secondary campus as a full community and testing and comparing various years of study, genders and housing situations will allow for the true impact of recreational services to come to light and demonstrate the importance to policy and decision makers across post-secondary campus' the benefits of recreational programs. Recreational programs need to be compared to other programs and services post-secondary institutions provide to truly understand where they rank in value to student's well-being and impact on perceptions of sense of community. Future research will allow for university administrators to see the value in recreational programming beyond the activity.

Additional suggestions for future research would be to revise the SCS scale and testing procedure. Upon analysis, the SCS Scale although efficient at testing perceptions of sense of community at a single point of time struggled at detecting changes at two points of time. The change of the four-point likert scale to a seven-point for each question would increase the variability in the measure of sense of community. The seven-point scale would allow for the examination of more finite feelings as well as allow for a midpoint for participants. Along with the seven-point scale the addition of a post-test then retrospective pretest design for the research

would allow for participants to fully understand their experience before commenting how much they have benefitted over the course of it. This design would help combat response shift bias by having participants comment on their experiences then reflecting back to when they first started to discuss their feelings and perceptions. By taking the post-test and pre-test at the same time it is more likely that both ratings will be made from the same frame of reference and understanding (Marshall, Higginbotham, Harris, & Lee. 2007).

In this study significantly less individuals completed the post-test compared to those who completed the pre-test. Because of this the number of matched pre-test/ post-test studies from participants was lower than it could be as both pre and post were needed for this study. There are a variety of reasons why this may have occurred, but the main reason is that individuals on the day of post-test collection simply did not want to fill out the test because they thought they already completed the study before despite being told during pre-test collection that they would complete another survey 6 weeks later. To assist in maintaining sample size future researchers could utilize participants emails and contact any that did not complete the post-test with a follow up message including an online variant of the post-test in hopes to capture their response to give a matched set. Another option to future researchers to maintain sample size would be to utilize a post-test then pre-test design. Using this collection strategy future researchers would sample participants on the last day of intramurals having them fill out their post-test about their current feeling then have them fill out their pre-test having them reflect on how they felt on their first day of the season. This strategy allows researchers to gain both data sets but only collect from participants once.

Another suggestion around the use of the SCS scale would be in its wording of its questions. In this research study each question was changed from the original SCS scale wording

of “archery club” to “intramural team”. Where this causes issue is in the factor of Administrative consideration which asks questions about leaders. This was confusing to participants as they did not know if it was leaders within their team or league leaders. Future studies in recreational sport using the SCS scale could clarify these leaders by putting in “team leaders” or “captains” to ensure participant comprehension of the questions. Future research is needed to see if this factor correctly applies to intramural recreation sport.

Conclusion

This study was intended to examine changes in students’ perceived sense of community over the duration of an intramural season at this specific institution. Through the use of a pre-test, post-test questionnaire and a non-parametric design model, it was determined that there were no significant changes in participants’ perceived sense of community over the course of an intramural season. However, it was found that both the pre-test and post-test data sets had almost identical very high sense of community reported despite being taken six weeks apart. This indicates that there was not a significant change in participants perception of sense of community between the pre and post-test but rather participants had high perceived feelings of sense of community both times.

The conclusion and findings of this study will contribute to the current body of knowledge on the benefits of campus recreational sports as well as contributing factors to sense of community in a post-secondary setting due to its exploration and discovery of high rates of perception of sense of community in a campus recreational program. These results invite future researchers, recreational providers and student life professionals alike to promote and encourage the use of these campus sports as an aid for the development of sense of community on campus. The results from this study are also congruent with other trends identified in previous research

identifying the social benefits that can come from campus recreational programs and facilities offered to students.

Going forward conclusions drawn from this study should be taken into consideration by various campus recreational sport professionals including; intramural coordinators, community programmers, sport practitioners, university recruitment officers, etc. as a call to action to work to understand how sense of community is created as a result of their programs. Working to understand the deeper impact of what is offered on a post-secondary campus to students and not just providing programs for the sake of doing so, has the potential to connect students to one another in a way that has important implications for student satisfaction with their overall academic experience.

References

- Allen, R., & Ross, C. M. (2013). An Assessment of Proximity of Fitness Facilities and Equipment and Actual Perceived Usage by Undergraduate University Students: A Pilot Study. *Recreational Sports Journal*, 37(2), 123–135.
- American Libraries, (4). 45. Art and Science Group. (2000). Intercollegiate athletics have little influence on college choice—intramural and recreational opportunities matter more. *Student Voice*, 4(4), 1–12.
- Aron, A., & Aron, E. N. (1999). *Statistics for psychology* (2nd ed.). Upper Saddle River, NJ: Prentice Hall.
- Artinger, L., Clapham, L., Hunt, C., Meigs, M., Milord, N., Sampson, B., & Forrester, S. (2006). The social benefits of intramural sports. *Journal of Student Affairs Research and Practice*, 43(1), 69-86.
- Astin, A. W. (1984). Student involvement: A developmental theory for higher education. *Journal of College Student Personnel*, 25(4), 297-308.
- Astin, A. W. (1993). *What matters in college? Four critical years revisited*. San Francisco: Jossey-Bass.
- Belch, H., Gebel, M., & Mass, G. (2001). Relationship between student recreation complex use, academic performance, and persistence of first-time freshman. *NASPA Journal*, 39, 14-22.

- Benjamin, M. (1996). The design of performance indicator systems: Theory as a guide to relevance. *Journal of College Student Development*, 37(6), 623-630.
- Boyer, E. (1990). *Campus life: In search of community*. A Special Report of The Carnegie Foundation for the Advancement of Teaching. Princeton, NJ: Princeton University Press.
- Brock University. (2014). *Intramurals*. Retrieved from <https://brocku.ca/recreation/intramurals/>
- Bryant, J. A., Banta, T. A., Bradley, J. L., (1995). Assessment Provides Insight into the Impact and Effectiveness of Campus Recreation Programs. *NASPA Journal* 32(1), 153–60
- Chavis, D.M., Lee, K.S., & Acosta, J.D. (2008, June). *The Sense of Community (SCI) Revised: The Reliability and Validity of the SCI-2*. Paper presented at the 2nd International Community Psychology Conference, Lisbon, Portugal.
- Cheng, D.X. (2004). Students' sense of campus community: What it means, and what to do about it. *NASPA Journal*, 41(2), 216-234.
- Chiessi, M., Cicognani, E., & Sonn, C. (2010). Assessing sense of community on adolescents: Validating the brief scale of sense of community in adolescents (SOC-A). *Journal of Community Psychology*, 38, 276-292.
- Christie, N.G. & Dinham, S.M. (1991). Institutional and external influences on social integration in the freshman year. *Journal of Higher Education*, 62(4), 412-428.

- Clopton, A.W. (2007). Predicting a sense of community amongst students from the presence of intercollegiate athletics: What roles do gender and BCS-affiliation play in the relationship? *The SMART Journal*, 4(1), 95-110.
- Clopton, A.W. (2008). College sports on campus: Uncovering the link between fan identification and sense of community. *International Journal of Sports Management*, 9, 343- 362.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Cronbach, L. J. , Gleser, G. C., Nanda, H., & Rajaratnam, N., (1972). *The dependability of behavioral measurements: Theory of generalizability for scores and profiles*. New York: Wiley.
- Dalgarn, M. K. (2001). The role of the campus recreation center in creating a community. *NIRSA Journal*, 25(1), 66-72.
- Danbert, S. J., Pivarnik, J. M., McNeil, R. N., & Washington, I. J. (2014). Academic Success and Retention: The Role of Recreational Sports Fitness Facilities. *Recreational Sports Journal*, 38(1), 14-22.
- Davidson, W. B., Beck, H. P., & Milligan, M. (2009). The College Persistence Questionnaire: Development and validation of an instrument that predicts student attrition. *Journal of College Student Development*, 50, 373-390.
- DeVellis, R. F. (2003). *Scale development : theory and applications*. Thousand Oaks, Calif. : Sage Publications, Inc.

- Dixon, M.A., & Warner, S. (May, 2012). *Meet the parents: Examining the parental experience in community youth sport*. Presented at the North American Society for Sport Management Conference, Seattle, WA.
- Durkheim, E. (1933). *The division of labor in society translated by George Simpson*. New York: The Free Press.
- Elkins, D. J., Forrester, S. A., & Noel-Elkins, A. V. (2011a). Students' perceived sense of campus community: The influence of out-of-class experiences. *College Student Journal*, 45(1), 105.
- Elkins, D. J., Forrester, S. A., & Noël-Elkins, A. V. (2011b). The contribution of campus recreational sports participation to perceived sense of campus community. *Recreational Sports Journal*, 35(1), 24-34.
- Ellis, G. D., Compton, D. M., Tyson, B., & Bohlig, M. (2002). Campus recreation participation, health, and quality of life. *Recreational Sports Journal*, 26(2), 51-60.
- Field, A. P., & Miles, J. (2010). *Discovering statistics using IBM SPSS Statistics: (and sex and drugs and rock "n" roll)*. SAGE.
- Forrester, S. (2014). *The benefits of campus recreation*. Corvallis, OR: NIRSA.
- Forrester, S. A., McAllister-Kenny, K., & Locker, M. (2018). Association Between Collegiate Recreational Sports Involvement and Undergraduate Student Retention. *Recreational Sports Journal*, 42(1), 64–74

- Franklin, D. (2013). Evolution of campus recreational sports: Adapting to the age of accountability. In *Campus recreational sports : Managing employees, programs, facilities, and services* (Eds.). Champaign, IL: Human Kinetics.
- Frey, B. (2018). *The SAGE encyclopedia of educational research, measurement, and evaluation* (Vols. 1-4). Thousand Oaks, CA: SAGE Publications,
- Gibbison, G. A., Henry, T. L., & Perkins-Brown, J. (2011). The chicken soup effect: The role of recreation and intramural participation in boosting freshman grade point average. *Economics of Education Review, 30*(2), 247-257.
- Heller, K. (1989). The return to community. *American Journal of Community Psychology, 17*, 1-15.
- Henchy, A. (2011). The influence of campus recreation beyond the gym. *Recreational Sports Journal, 35*(2), 174-181.
- Henchy, A. (2013). The perceived benefits of participating in campus recreation programs and facilities: A comparison between undergraduate and graduate students. *Recreational Sports Journal, 37*(2), 97-105.
- Hill, J. (1996). Psychological sense of community: Suggestions for future research. *Journal of Community Psychology, 24*, 431-438.
- Huesman R., Brown, A. K., Lee, G., Kellogg, J. P., & Radcliffe, P. M. (2009). Gym bags and mortarboards: Is use of campus recreation facilities related to student success? *Journal of Student Affairs Research and Practice, 46*(1), 50-71.

- Hyatt, R. W. (1971). Evaluation in intramurals. *Journal of Health, Physical Education & Recreation*, 42, 39–40
- Hyatt, R. W. (1977). *Intramural Sports: Organization and Administration*. Saint Louis C.V. Mosby.
- Janosik, S. (1991). *The campus community scale*. Blacksburg, VA: Virginia Tech.
- Kellett, P., & Warner, S. (2011). Creating communities that lead to retention: The social worlds and communities of umpires. *European Sport Management Quarterly*, 11, 471-498.
- Kooman, B. (1976). Trends in the planning of rec-sports facilities. *Recreational Sports Journal*, 1, 56–57.
- Kraemer, H. C., & Thiemann, S. (1987). *How many subjects? Statistical power analysis in research*. Newbury Park, CA: Sage.
- Kraska, M. (2010). Multivariate analysis of variance (manova). In N. J. Salkind (Ed.), *Encyclopedia of research design* (pp. 858-862). Thousand Oaks, CA: SAGE Publications, Inc.
- Kuh, G. D. (2009). The National Survey of Student Engagement: Conceptual and Empirical Foundations. *New Directions for Institutional Research*, (141), 5–20.
- Lindsey, R., & Sessoms, E. (2006). Assessment of a campus recreation program on student recruitment, retention, and frequency of participation across certain demographic variables. *Recreational Sports Journal*, 30(1), 30-39.

- Lindsey, R., Sessoms, E., & Willis, G. (2009). Impact of campus recreational sports facilities and programs among on recruitment and retention among African American students: A pilot study. *Recreational Sports Journal*, 33(1), 25–34.
- Lloyd-Jones, E. (1989). Foreword. In M.J. Barr and M.L. Upcraft (Eds.), *Designing campus activities to foster a sense of community. (New Direction for Student Services, no. 48)*. San Francisco, CA: Jossey- Bass.
- Marcoulides, G. A. (1993). Maximizing power in generalizability studies under budget constraints. *Journal of Educational Statistics*, 18 (2), 197-206.
- Marshall, B., Higginbotham, B., Harris, V., Lee, T. (2007). Assessing Program Outcomes: Rationale and Benefits of Posttest-then-Retrospective-Pretest Designs. *Journal of Youth Development*, (1), 118.
- McCole, D., Jacobs, J., Lindley, L., & McAvoy, B. (2012). The Relationship Between Seasonal Employee Retention and Sense of Community: The Case of Summer Camp Employment. *Journal of Park and Recreation Administration*, 30, 85-101.
- McMillan, D., & Chavis, D. (1986). Sense of community: A definition and theory. *Journal of Community Psychology*, 14, 6-23.
- McPherson, M., Smith-Lovin, L., & Brashears, M.E. (2006). Social isolation in America: Changes in core discussion networks over two decades. *American Sociological Review*, 71, 353-375.

- Means, L. E. (1973). *Intramurals: their organization and administration*. Englewood Cliffs, N.J. : Prentice-Hall, [1972, c1973].
- Miller, J.J. (2011). Impact of a university recreation center on social belonging and student retention. *Recreational Sports Journal*, 35(2), 117–129.
- Moore, J., Lovell, C. D., McGann, T., & Wyrick, J. (1998). Why Involvement Matters: A Review of Research on Student Involvement in the Collegiate Setting. *College Student Affairs Journal*, 17(2), 4–17
- Mueller, P., & Mitchell, E. D. (1971). *Intramurals: programming and administration*. 4th ed. New York; Ronald Press.
- Noel-Elkins, A.V., Elkins, D., & Forrester, Scott. (2010). The importance of establishing “Micro-Communities” within campus activities. *Campus Activities Programming*, 43, 27-30.
- Olds, J., & Schwartz, R. S. (2010). The Lonely American: Drifting Apart in the Twenty-first Century. *The Hedgehog Review*, (1), 94.
- Pascarella, E. T., Salisbury, M. H., & Blaich, C. (2013). Design and analysis in college impact research: Which counts more? *Journal of College Student Development*, 54(3), 329–335.
- Peterson, N.A., Speer, P.W., Hughey, J., Armstead, T.L., Schneider, J.E., & Sheffer, M.A. (2008). Community organizations and sense of community: Further development in theory and measurement. *Journal of Community Psychology*, 36, 798-813

- Phipps, C., Cooper, N., Shores, K., Williams, R., & Mize, N. (2015). Examining the Relationship Between Intramural Sports Participation and Sense of Community Among College Students. *Recreational Sports Journal*, 39(2), 105–120.
- Pollock, H. (2019) Exploring Recreation and Sense of Community in the Canadian Military. *Brock University*.
- Power, S., & Forrester, S. (2017). Relationship between Collegiate Intramural Sport Participation and Social Integration into the Campus Community. *International Journal of Sport Management*, 18(3), 441–459.
- Putnam, R. D. (2001). *Bowling alone: the collapse and revival of American community*. New York : Simon & Schuster.
- Robertson, S. (2014). Declining enrolment in Ontario: What can history tell us and where do we go from here. *Canadian Journal of Educational Administration and Policy*, 164, 1–29.
- Rodrik, D. (1999b). *The new global economy and developing countries: Making openness work*. Baltimore, MD: Johns Hopkins University Press.
- Rodrik, D.(1999a).Where did all the growth go? External shocks, social conflicts, and growth collapses. *Journal of Economic Growth*, 4, 385-412.
- Russell, P. A. (1973). Relationships between Exploratory Behaviour and Fear: A Review. *British Journal of Psychology*, 64(3), 417.

- Salkind, N. J. (2010). *Encyclopedia of research design* Thousand Oaks, CA: SAGE Publications, Inc.
- Scanlan, T. K., Simons, J. P., Carpenter, P. J., & Schmidt, G. W. (1993). The Sport Commitment Model: Measurement development for the youth-sport domain. *Journal of Sport & Exercise Psychology, 15*(1), 16-38.
- Sibthorp, J., Paisley, K., Gookin, J., & Ward, P. (2007). Addressing Response-shift Bias: Retrospective Pretests in Recreation Research and Evaluation. *Journal of Leisure Research, 39*(2), 295.
- Stein, E. (1985). The first organized intramural event (1869) Princeton University's Cane Spree - a most special, special event. *NIRSA Journal: Journal of the National Intramural-Recreational Sports Association, 9*(2), 42-43.
- Sturts, J. R., & Ross, C. M. (2013). Collegiate intramural sports participation: Identified social outcomes. *International Journal of Sport Management, Recreation and Tourism, 11*, 25-41.
- Tabachnick, B. G., & Fidell, L. S. (1996). *Using multivariate statistics* (3rd ed.). New York: HarperCollins.
- Tinto, V. (1987). *Leaving college: Rethinking the causes and cures of student attrition*. Chicago, IL: University of Chicago Press.

- Warner, S. (2012a). Sport and Community. In G.B. Cunningham & J.N. Singer (Eds.), *Sociology of sport and physical activity* (2nd ed., pp. 237-254). College Station, TX: Center for Sport Management Research and Education.
- Warner, S. (May, 2012b). *The community impact of a short- term sport event for adolescents*. Presented at the North American Society for Sport Management Conference, Seattle, WA.
- Warner, S., & Dixon, M. A. (2011). Understanding Sense of Community From the Athlete's Perspective. *Journal of Sport Management*, 25(3), 257–271.
- Warner, S., & Dixon, M.A. (2013). Sport and community on campus: Constructing a sport experience that matters. *Journal of College Student Development*, 54, 283-298
- Warner, S., Dixon, M.A., & Chalip, L.C. (2012). Ae. *Journal of Community Psychology*, 40, 983-1003.
- Warner, S., Kerwin, S., & Walker, M. (2013). Examining sense of community in sport: Developing the multidimensional 'SCS' scale. *Journal of Sport Management*, 27(5), 349-362.
- Weare, K. (2000). *Promoting mental, emotional, and social health. [electronic resource]: a whole school approach*. London; New York: Routledge.
- Woosnam, K. M., Dixon, H. E. T., & Brookover, R. S. (2006). Influence of campus recreation facilities on decision to attend a Southeastern University: A Pilot Study. *Recreational Sports Journal*, 30(1), 70–76.

Zizzi, S., Ayers, S. F., Watson, J. C., & Keeler, L. (2004). Assessing the impact of new student campus recreation centers. *Journal of Student Affairs Research and Practice*, 41(4), 1156-1198.

Appendix

Name: _____

Brock Email: _____@brocku.ca

< ----- researcher to tear-off above and securely store once submitted ----- >

Impact of Intramural Sports Participation on Sense of Community**INSTRUCTIONS:**

Please invest a few moments of your time to provide information about your current intramural sports participation here at Brock University. This survey will only take 2-3 minutes of your time. Please return the completed survey to the researcher. Thank You!

SECTION I: General Information

Have you read the Informed Consent Letter, and do you freely consent to participate in this research project? Yes No

Participant ID#: _____

1. Gender: Male Female Transgendered Other
2. Age: _____ (years)
3. Year at Brock: 1st year 2nd year 3rd year 4th year 5th year or higher
4. Type of Education: Undergraduate Studies Graduate Studies/ Teacher's College
5. How many years have you attended Brock University? _____ (years)
6. Ethnicity: White North American Indian Metis Inuit Chinese South Asian Black Filipino Arab Latin American Southeast Asian West Asian Japanese Korean Other: _____
7. Residence: On-Campus Living Off-Campus Housing Home
8. Intramural Division: Co-Ed Men's Women's
9. Level of Play: Recreational Competitive A Competitive B

SECTION II – Sense of Community

Please indicate your level of agreement to the following questions...

Not at All True	Somewhat True	Mostly True	Completely True
-----------------	---------------	-------------	-----------------

1. Leaders of my Intramural Team care about other members

1	2	3	4
---	---	---	---

2. Leaders of my Intramural Team support other members

1	2	3	4
---	---	---	---

3. I feel comfortable talking openly with the Leaders of my Intramural Team

1	2	3	4
---	---	---	---

4. The leaders make me feel like a valued member of my Intramural Team

1	2	3	4
---	---	---	---

5. I share similar values with other members in my Intramural Team

1	2	3	4
---	---	---	---

6. I feel like I belong in my Intramural Team	1	2	3	4
7. My Intramural Team provides me with friends who share a strong commitment to Intramurals	1	2	3	4
8. I trust the members of my Intramural Team	1	2	3	4
Please indicate your level of agreement to the following questions...	Not at All True	Somewhat True	Mostly True	Completely True
9. I feel a bond with other members of my Intramural Team when we're competing against others	1	2	3	4
10. I like the level of competition with other Intramural Teams	1	2	3	4
11. Competing with other teams with my Intramural Team is fun	1	2	3	4
12. There is too much competition between other teams and my Intramural Team	1	2	3	4
13. Leaders in my Intramural Team make decisions that benefit everyone	1	2	3	4
14. Leaders in my Intramural Team make decisions that are fair	1	2	3	4
15. The decisions made by leaders in my Intramural Team favor some members over others	1	2	3	4
16. Leaders in my Intramural Team consider everyone's needs when making decisions	1	2	3	4
17. I have influence over what my Intramural Team is like	1	2	3	4
18. If there is a problem in my Intramural Team, I can help to solve it	1	2	3	4
19. I have a say about what goes on in my Intramural Team	1	2	3	4
20. Being a member of my Intramural Team gives me opportunities to lead	1	2	3	4
21. When going to an Intramural game or practice, there are places where I can interact with other teammates	1	2	3	4
22. When going to an Intramural game or practice, I know I'll have an area where I can interact with other teams	1	2	3	4
23. Intramural practices and competitions create a place for me to interact with other teams	1	2	3	4
24. My Intramural Team provides me a place to interact with other teams	1	2	3	4
25. I am a part of my Intramural Team because I want to be	1	2	3	4
26. Participating in Intramurals never feels like a chore (or job)	1	2	3	4

27. I participate in Intramurals because of pressure from my family or friends	1	2	3	4
28. I am not forced to be a member of my Intramural Team	1	2	3	4

Please return this completed survey to the researcher.

Thank you for your time and participation in this study