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Collegiate Recreation Participation and Student Retention, Progression, and Graduation

Gabriela McCollum

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COLLEGIATE RECREATION PARTICIPATION AND STUDENT RETENTION,
PROGRESSION, AND GRADUATION

by

Gabriela McCollum

(Under the Direction of Teri Denlea Melton)

ABSTRACT

The purpose of this study was to examine the relationship between collegiate recreation participation and students' retention, progression, and graduation (RPG) rates. This study employed a quantitative, ex post facto research design along with descriptive analyses of two research questions. Archival data were gathered for an incoming first-year cohort of 3,516 students at a research-intensive university in the Southeast United States. The present study found that participants within the cohort who were classified as *high participation* in collegiate recreation were more likely to be retained from the first to the second year. Evidence of this finding was presented with statistical significance and higher odds ratios. Furthermore, *high participation* in collegiate recreation was a better predictor of progression in four out of five academic years. Only one academic year, 2014-2015, was found to favor *low participation* in progression of the cohort. Finally, graduation rates of the cohort were examined. Those within the *high participation* category presented statistical significance in graduation rates for four-years, five-years, and six-years. The findings of this research uncovered statistically significant evidence, as well as positive practical effects, linking collegiate recreation participation and RPG rates. The present study affirms the importance of collegiate recreation in a student's life; therefore, recreational facilities should be met with financial support from the university.

INDEX WORDS: Collegiate recreation, Retention, Progression, Graduation, Ex post facto, Student involvement, First-year students.

COLLEGIATE RECREATION PARTICIPATION AND STUDENT RETENTION,
PROGRESSION, AND GRADUATION

by

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DOCTOR OF EDUCATION

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DEDICATION

This dissertation is dedicated to my husband Ryan McCollum who has been an unwavering support system in my journey to a terminal degree for the last 5 years. Undoubtedly, without his support and encouragement, I would have succumbed to the stress and pressures of working a full-time job and being in college. Regardless of the difficult times, he was there every step of the way to help me, guide me, and cheer me on. We have laughed and cried, but above all we have loved one another unconditionally. Along this journey there was another major companion and source of inspiration. I would be remiss if I do not add my faithful “study buddy” Jasmine to this dedication. As the best pup in the world, she sat for hours on-end under the desk, keeping me company during late nights and early mornings and making sure my toes kept warm during cold nights.

I would also like to dedicate this dissertation to my mom, Esperanza Manjarres. She, like many moms of the world, has sacrificed herself to provide me and my siblings with opportunities beyond our wildest dreams. There are not enough words in the world to express my gratitude and love for all that she has done and continues to do for our family. She is full of life and I admire how courageous and kind she is to all who she encounters.

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CHAPTER I

INTRODUCTION

Collegiate recreation programs seek to extend the learning environment for college students beyond the walls of a classroom, however these programs seem to be underutilized in the efforts of improving recruitment, retention, progression, and graduation (RPG) rates. While higher education administrators have employed abundant techniques to improve RPG rates, no one has identified a *magic formula* to diminish dropout rates in the American higher education system. College administrators have recognized the need for increases in student satisfaction, as the institutional priorities shift to the improvement of RPG rates.

Higher education is grounded in the fundamental aims of opportunity, creative understanding, and contributions to society (Brighouse & McPherson, 2015). However, the benefits of higher education have not overcome major deficits in RPG rates. The majority of colleges in the U.S. reported decreases in fall enrollment (5%), in full-time students (4%), and in males (6%) between 2010 and 2015 (U.S. Department of Education, 2017). Furthermore, these decreases have proven to be problematic in the finances of the institutions, as tuition is a major source of funding and governmental funding is tied with RPG rates.

Identifying ways to improve student satisfaction is an important factor in the improvement of RGP rates. Students who become more involved in campus activities, organizations, and with other students develop affinity for the institution and create relationships that encourage retention (Astin, 1984). Collegiate recreation has been positively correlated with student development, academic success, and improvements of RPG rates (Brock, Carr, & Todd, 2015; Danbert, McNeil, Pivarnik, & Washington, 2014; Gayles & Baker, 2015; McElveen & Rossow, 2014; Roddy, Pohle-Krauza, & Geltz, 2017; Weaver, Forte, & McFadden, 2017).

Intercollegiate athletics have been around college campuses since the mid-1800s and it was not until the turn of the century that intramural sports would be conceived. First thought of as a non-contributor in the lives of students in higher education, collegiate recreation has championed student development in both physical and mental health. Students who engage in regular physical activities have demonstrated academic success with higher GPA, as well as better functions in the brain (Hayes et al., 2015; Roddy, Pohle-Krauza, & Geltz, 2017). Mental illness symptoms are often relieved with physical activities; therefore, students who are more physically active are less likely to suffer from mental disorders such as anxiety or depression. Furthermore, collegiate recreation has played a role in the improvement of RPG rates among students, as students who participate in collegiate recreation are more academically successful. The theory of student involvement (Astin, 1984) is grounded on the foundation that students who are more involved in university activities, like collegiate recreation, are more likely to persist to graduation at the institution. This chapter will be organized in six sections: statement of the problem, purpose of the study, significance of the study, procedures, and definition of key terms.

Statement of the Problem

Improvement of RPG rates among college students has become a top priority for higher education administrators, as the United States continues to decline in global competitiveness. At the root of the decline is insufficient progress in education. Collegiate recreation has been found to have positive effects in the improvement of RPG rates, however collegiate recreational departments are not perceived as key contributors of solving the problem by higher education administrators. The relationship between collegiate recreation and RPG rates is not well-established in the literature; therefore, there is a need to bridge the literature gap. Currently, there is no *magic formula* to improve RPG rates, however higher education administrators are

searching for a solution to decrease dropout rates and improve graduation rates. The present study investigated the relationship between participation in collegiate recreation and RPG rates.

Purpose of the Study

The purpose of this study was to investigate if a relationship existed between student participation in collegiate recreation and student RPG rates at a research-intensive university in the Southeast United States. Using a quantitative method approach, data were collected from an Institutional Research (IR) office at a university on academic enrollment, retention and graduation rates, as well as collegiate recreation participation. The aim of this study was to determine a positive statistical and practical effect between participation in collegiate recreation and RPG rates. Participation in collegiate recreation was measured by the number of times a student swiped their identification card at the Recreational Activity Center (RAC). Collegiate recreation programs have been associated with physical and mental health, academic success, and student development. Additionally, collegiate recreation participation has been associated with reduced stress and increased sense of belonging. In the present literature, however, there was a gap between collegiate recreation participation and the improvement of RPG rates. A positive correlation between collegiate recreation participation and RPG rates could mitigate the declining trends persisting in the American higher education system.

The present study examined the participation in collegiate recreation, specifically with the department of Campus Recreation and Intramurals (CRI) and RPG rates. The study will answer the following questions:

1. Does participation in collegiate recreation predict retention?
2. What is the relationship between participation in collegiate recreation and students' progression and graduation?

Significance of the Study

Collegiate recreation has been linked with many possible attributes that enrich the lives of college students. However, there is a gap in the literature between collegiate recreation participation and the improvement on RPG rates. The findings from the present study investigated collegiate recreation participation as a viable resource in the efforts of RPG improvement. This research is vital to collegiate recreational departments to justify their existence and to add validity to the field.

Through the present study, the collegiate recreation field was advanced, as this research provided important data to help bridge the literature gap in the benefits of collegiate recreation as it pertains to improvements of RPG rates. While some studies have been conducted in the field of collegiate recreation to correlate participation and RPG rates, the present study is unique in that it addresses RPG rates in a holistic approach. Most of the current literature in the field of collegiate recreation presents positive correlations in a focused area like retention or academic success. It is the hope that the present study will be used to emphasize the relationship between collegiate recreation and the overall improvement of RPG rates.

Procedures

The purpose of this study was to investigate if a relationship existed between student participation in collegiate recreation and student RPG rates at a research-intensive university in the Southeast United States. This quantitative study gathered data from IR on academic enrollment, retention and graduation rates, as well as collegiate recreation participation on the incoming first-year class from the fall of 2011. Data were gathered through the following six years—until 2017. To ensure that the Family Educational Rights and Privacy Act of 1974 (FERPA) and Health Insurance Portability and Accountability Act of 1996 (HIPAA) laws were

followed, IR removed the student's original identification numbers and replaced them with fabricated identification numbers. Additionally, Internal Review Board (IRB) approval was obtained (see Appendix B).

The present study used binary logistic regressions to measure the statistical and the practical effects of collegiate recreation participation on RPG rates in the chosen cohort. To investigate retention and progression, the threshold for collegiate recreation participation was established with the median number of RAC swipes in a given academic year. The median was thought to be the best indicator for participation, as it was influenced by a high and low distribution (Salkind, 2010). Participants with one visit less than the median for that given academic year were classified as *low participation* and participants with visits equal to or greater than the median were classified as *high participation*. The mean participation for four years, five years, and six years were identified to establish a threshold for participation when observing graduation rates. Participants who graduated were classified as *low participation* if they averaged one visit less than the mean for the time frame in which they graduated and *high participation* if they averaged the mean number of visits or more. Participants with no data in RAC participation were excluded from the present study.

Definition of Terms

The following terms are defined for the purpose of this study:

Attrition: Attrition is a term that, "refers to a student who fails to re-enroll at the institution in consecutive semesters" (Nora et al., 2012, p. 12).

Collegiate Recreation (synonyms: campus recreation, recreational sports, intramural sports, and recsports): Collegiate recreation is a department within higher education in the United States where sporting activities are housed. Often associated with a fitness center where

students can exercise. For the purpose of this study, only the term collegiate recreation will be used.

Exercise: Exercise is a term where, “planned, structured, repetitive and purposive in the sense that improvement or maintenance of one or more components of physical fitness is an objective” (Hayes et al., 2015, pp. 780-781).

Graduation: Graduation is the conferring of an academic degree.

Persistence: Persistence is the term that, “refers to the desire and action of a student to stay within the system of higher education from beginning year through degree completion” (Nora et al., 2012, p. 12).

Physical Activity: Physical activity is, “any bodily movement produced by skeletal muscle that results in energy expenditure” (Hayes et al., 2015, p. 781).

Progression: Progression in higher education is the measure of advancement in academic years without stopout.

Recruitment: Recruitment refers to the strategies and actions of soliciting new students into an institution by higher education administrators.

Retention: Retention is “a measure of the rate at which students persist in their educational program at an institution, expressed as a percentage. For four-year institutions, this is the percentage of first-time bachelor's (or equivalent) degree-seeking undergraduates from the previous fall who are again enrolled in the current fall. For all other institutions, this is the percentage of first-time degree/certificate-seeking students from the previous fall who either re-enrolled or successfully completed their program by the current fall.” (NCES, 2018, “Glossary-R,” para. 3).

Stopout: The term stop out, “refers to a student who temporally withdraws from a college or university campus” (Nora et al., 2012, p. 12).

Student involvement: Student involvement is, “the amount of physical and psychological energy that the student devotes to the academic experience” (Astin, 1984, p. 518).

Chapter Summary

Since its inception in the mid-1800s, intercollegiate athletics has played a vital role in the American higher education system. In the mid-1950s, the field of collegiate recreation was established and began to be seen as a contributor in lives of students on campus. Through collegiate recreation programs, services, and facilities, college students can engage in physical activities, potentially evade mental illnesses, and hopefully become academically successful. Students who engage in regular physical activity have demonstrated academic success with higher GPA, as well as better functions in the brain and the body. Mental illnesses are often relieved with physical activities, indicating that students who are more physically active are less likely to suffer from disorders like anxiety and depression. Furthermore, collegiate recreation has played a role in the improvement of RPG rates among students.

Improvement of RPG rates among college students has become top priority for administrators, as the United States continues to decline in global competitiveness. At the root of the decline is insufficient progress in education. Collegiate recreation has positive effects in the improvement of RPG rates; however, collegiate recreational departments are not seen as key contributors of solving the problem. Using binary logistic regressions, the present study investigated the relationship between participation in collegiate recreation and student RPG rates. Through the present study, the field of collegiate recreation will be strengthened and validated as a resource in the endeavors of improving RPG rates among college students

CHAPTER II

REVIEW OF LITERATURE

While the research is replete with strategies for successful recruitment and retention, the growing field of collegiate recreation is an underexplored tool for retention, progression, and graduation (RPG) of college students. To recruit college-bound students, higher education administrators are having to find new and innovative ways to present their institution as the best choice. With the mission of recruiting, retaining, and graduating students, colleges and universities are locked in an arms race to attain students. However, to date, higher education institutions do not have a *magic formula* to ensure retention, progression, or graduation. Despite the significant societal benefits and annual earnings that a college degree provides, insufficient progress in education is at the root of the United States declining in global competitiveness (Brighthouse & McPherson, 2015). Moreover, those who only possess a high school diploma can expect to earn just 62% of the median annual earnings of their peers who lead careers with college degrees (Brown, 2016).

In this chapter, relevant literature identifies collegiate recreation as a resource for improving RPG rates in college students. This literature review is divided into four sections: collegiate recreation history, effects of collegiate recreation in student development, RPG efforts in collegiate recreation, and the theoretical framework that guided this study. The initial review section highlights the history of sports in higher education. Consequent sections identify physical, mental, and academic benefits in students who participate in collegiate recreation. The following sections describes participation in collegiate recreation and the effects on recruitment, retention, progression, and graduation. Finally, the last section identifies the theory of student involvement as a theoretical framework to guide the present study. This literature review

primarily contains studies in published peer review journals identified through the main database of the university at which the research was conducted and the main database at the university at which the researcher is employed.

Collegiate Recreation History

In the post-civil war era of higher education history, recreational activities were seen as a means to build morality and good character among students; however, these activities were implemented by students, as college officials did not see student learning contributions. Since the mid-1800s, *intercollegiate athletics* have been present on college campuses. However, these sporting activities were viewed as “detractors” from the educational mission of the institution (Weight & Huml, 2016). In 1852, Lake Winnepesaukee in New Hampshire would serve as the host site for the first ever collegiate athletics match recorded in history; a boat race between Harvard and Yale (Harper & Donnor, 2017). Hundreds of spectators gathered around to lake to see the two most popular colleges in the country compete. From this point forth, collegiate sports would have a place in higher education and take a more serious turn as popularity and development of sports infiltrated institutions. However, despite the popularity among students, college administrators would still have a negative outlook on collegiate sports. They did not see the importance or the impact and took the stance of neither tolerated nor restricted (McClenlan, King, & Rockey, 2012).

At the turn of the century, college administrators began to look at sports in higher education differently and they recognized that students were more interested in the fun and enjoyment of participation in sports instead of competition. In 1904, the president at Cornell University saw the value in sport activities and created a sport program for students who were not intercollegiate athletes. This was a revolutionary idea, as only intercollegiate athletes had the

opportunity to engage in sports. Following the lead from Cornell University, the University of Michigan and the Ohio State University created the first intramural sports departments in 1913. The creation of these departments would mark the separation between intercollegiate athletics and collegiate recreation. Collegiate recreation would become an open program for the entire student body, whereas intercollegiate athletics would become a program for a small number of elite students in their sport.

Once the separation was made evident, intramural sports programs were used as farm systems to recruit varsity talent, a common practice until the 1920s. In 1946, William Wasson discovered the values of intramurals while studying physical education at the University of Michigan (NIRSA, n.d.). Years later, Wasson would champion the field of collegiate recreation by creating an intramurals department in 1948 at Dillard University in Louisiana. Wasson founded the National Intramural Association (NIA) and held the first summit of the NIA in 1950. Wasson and 20 other intramural directors representing their colleges, gathered with the mission of exchanging ideas about intramurals and creating basic guidelines for the field (NIRSA, n.d.). Through the years, the NIA sustained changes and in 1975 the name of the organization changed to the National Intramural-Recreation Sports Association (NIRSA) to include other recreational activities, such as aquatics, fitness, and club sports. Known now as NIRSA: Leaders in Collegiate Recreation, “NIRSA is a leader in higher education and the advocate for the advancement of recreation, sport, and wellness by providing educational and developmental opportunities, generating and sharing knowledge, and promoting networking and growth for our members” (NIRSA, n.d., “Our Mission”). NIRSA serves as the governing body for the collegiate recreation field in the U.S. and Canada.

Collegiate recreation professionals, “maintain a shared vision that wellness both enhances the college experience and advance the holistic development of college students” (McFadden & Molina, 2016, pp. 431-432). To achieve this vision, collegiate recreation professionals utilize the *CAS Professional Standards for Higher Education*, the *NIRSA: Leaders in Collegiate Recreation Core Competencies*, and continuing education opportunities as guiding principles. The *CAS Professional Standards for Higher Education* identifies 44 functional areas in the Recreational Sports Programs section. These areas provide a baseline for collegiate recreation programs to enhance, grow, and assess the needs of the program. The *NIRSA: Leaders in Collegiate Recreation Core Competencies*, specifically identifies the expectations of its professional members. To establish legitimacy for professional collegiate recreation practitioners, a credential called Certified Recreational Sports Specialist (CRSS) was created. Finally, NIRSA: Leaders in Collegiate Recreation provides opportunities for continuing education through state, regional, and national conferences. Through conferences, practitioners and students can participate in pre-conference activities, workshops, and presentations (McFadden & Molina, 2016).

Effects of Collegiate Recreation on Student Development

The higher education system, through its complex yet rewarding path, provides a unique opportunity for students to engage in self-development and acquisition of moral values. Along the pathway, educators and administrators contribute to students’ lives with guidance and advice. Within academics and extracurricular activities, college officials are charged with, “offering experiential education-based opportunities to build skills” (Jordan, Gagnon, Anderson, & Pilcher, 2018, p. 91) to enhance and create student development opportunities. Such experiential educational opportunities can be found in many ways within higher education. Collegiate recreation programs are an opportunity for involvement and integration into the fabric of the

institution community. Physical activities allow students to gain positive benefits in the areas of physical and mental health, as well as in academic performance.

Physical Health

It is well-known that physical activity is a good promoter of overall well-being. Seminal work on well-being by Dunn (1959) defined *wellness* as, “an integrated method of functioning which is oriented toward maximizing the potential of which the individual is capable, within the environment where he is functioning” (p. 447). Dunn (1959) described good health as a, “passive state of freedom from illness” (p. 447) and implied that well-being is the directional progress toward optimal potential of functioning. Throughout the course of history, there have been many definitions on well-being; however, the premise is centered on health, happiness, and prosperous welfare. Furthermore, wellness is not limited to the physical body, as personality and environmental factors play a role. The integration of the whole—mind, body, and spirit—are fundamental for well-being (Dunn, 1959).

For wellness to be developed, lifelong healthy behaviors, such as regular physical activity, can have many implications in a student's life. However, a steady decrease in physical activity among 18 to 24-year-olds, especially within females, has been observed (Kim & Han, 2016). This sharp decline in physical activity has led to the onset of various adult diseases in younger adults (Kim & Han, 2016). Critical body functions like memory cognition, sleep patterns, and the cardiorespiratory system can be positively impacted by physical activity.

Episodic memory, *the memory for events* (Hayes et al., 2015), is an important source of cognitive performance. Located in the hippocampus of the brain, episodic memory is responsible for emotions, times, places, and contextual knowledge. While there are many factors that can impact episodic memory, “physical activity is one individual difference factor that may

positively impact executive function and episodic memory” (Hayes et al., 2015, p. 780). In a study of younger and older adults, Hayes et al. (2015) examined the relationship between physical activity and neurocognitive functions. The study revealed that sedentary time had a negative association with visual episodic memory among adults. Conversely, physical activity was positively associated with visual episodic memory and performance on neuropsychological tests; “[Fifty percent] of Americans do not meet the current recommended guidelines for regular aerobic physical activity” (Hayes et al., 2015, p. 781), which can lead to more adults having cognition-related illnesses later in life. Moreover, physical activity has been linked to profound changes in brain, for example gray matter density, specifically with neural gray and white matter volume and white matter microstructure (Hayes et al., 2015). By increasing physical activity, college students can see notable changes in their cognition. Through collegiate recreation programs, college students can participate in many different types of sports and fitness activities that elicit physical activity, thereby preventing neurological deficits in the future. *Physical activity* refers to, “any bodily movement produced by skeletal muscle that results in energy expenditure” whereas *exercise* is a, “planned, structured, repetitive and purposive in the sense that improvement or maintenance of one or more components of physical fitness is an objective” (Hayes et al., 2015, pp. 780-781). It is important to note the differences between physical activity and exercise, as subtle changes like taking the stairs instead of the elevator or biking to class instead of driving, can promote well-being and have positive effects in the brain.

The brain can be considered as the central organ of the human body, as it regulates physiological and behavioral responses (Parrino & Vaudano, 2018). A vital process to preserve a healthy brain is sleep. Through sleep, the brain can, “regulate the complex organization of brain dynamics by keeping excitatory and inhibitory processes balanced” (Parrino & Vaudano, 2018,

p. 99). Due to self-imposed stress from increasing educational and social demands, as well as social maturity level (Valerio, Kim, & Sexton-Radek, 2016), college-age students are more vulnerable to sleep deprivation and/or inadequate sleep patterns. Inadequate sleep, which is less than seven hours of sleep, is also associated with negative eating attitudes and even binge-eating behaviors, which lead to obesity (Quick et al., 2015). Students who report poor sleep quality and describe unhealthy eating behaviors (low eating competence) were associated with overweight or obesity issues. Among other contributors to sleep problems within college students is the use of cigarettes and alcohol (Valerio, et al., 2016). Engaging in healthy practices, like physical activity, can have a positive effect on sleep. As a major restorative process of the brain with implications in emotional, cognitive, and psychomotor functions, sleep is important and vital for academic success.

Despite the ample research on the importance of physical activity for healthy bodily functions, more than one third of Americans are obese (Ickes, McMullen, Pflug, & Westgate, 2016). College students fail to meet the recommendation for daily fruit and vegetable intake (Brock, Carr, & Todd, 2015), as well as physical activity, which continues to perpetuate the obesity epidemic in the U.S. To better conceptualize the obesity epidemic, medical practitioners describe the *5D*'s of obesity as: disfigurement, discomfort, disability, disease, and death (Kim & Han, 2016). Physiological well-being can be achieved by properly managing body weight and body composition. Even with copious amount of research on healthy practices, irregularities in body composition have been found among women due to the pursuit of the “perfect” body shape and body weight from societal pressures in the U.S.

The effects of complex training on body composition and the cardiorespiratory system among college females has been shown to have positive impacts (Kim & Han, 2016). In fact, a

complex exercise program indicated improvements in, “the respiratory circulation function and strengthen the overall skeletal muscle, which in turn burns body fat” (Kim & Han, 2016, p. 2378). Furthermore, after a 12-week program the results of this study suggested that physical activity does more than burn body fat, as it has been linked to benefits at the molecular level in the body. The human body possess many protective mechanisms, such as telomeres, which are repetitive sequences that are located at the end of linear chromosomes. Telomere act as a shield to protect the chromosomes from damages. The longer the telomere is, the more protection it can provide to the chromosome. Unhealthy habits, like smoking cigarettes, have been linked to shorter telomeres, whereas vigorous physical activity has been linked to longer telomeres (Latifovic, Peacock, Massey, & King, 2016). Through physical activity and exercise, students can achieve the right balance for body composition for healthy living.

Physical activity is necessary for healthy bodily functions. The brain, among other major organs in the body, can be positively affected by engaging in regular physical activity. Essential body functions that are compromised through inactivity or through unhealthy behaviors can have major implications in a student’s well-being. Cognition, as well as systems in the body, function less efficiently through a sedentary lifestyle. College students are more susceptible to obesity due to a decrease of physical activity and high levels of stress. However, students who engage in healthy practices like avoiding alcohol and cigarettes, eating fruits and vegetables, and regularly engaging in collegiate recreation programs for physical activities, can prompt cognitive functions throughout their college career and minimize health risks in the future.

Mental Health and Physical Activity

A topic of major concern for higher education administrators is mental health among college students. Higher education institutions have seen major increases in the need for mental

health professionals, psychologists, and therapists. In fact, a university study found a 231% increase in yearly visits to a counseling center, as well a 173% increase in yearly clients was seen in a counseling center (Beiter et al., 2015). This disproportionate growth has created a challenging environment for higher education administrators, as there seems to be no end in sight for the need and the demand of mental health professionals on college campuses. Onset of mental illness typically occurs before the age of 24 (Fortney, 2016) and with stress becoming more prevalent among college students, higher education administrators seek to find solutions to the mental health crisis. Academic pressures, test taking, large quantities of material to be learned, and time management have been associated as stressors for psychological disorders in college students (Beiter et al., 2015). Among the most prevalent mental health illnesses, anxiety, depression, and eating disorders rise to the top of the list.

Anxiety is a complex and elusive mental health disorder; this mental illness is generally characterized as having, “negative feelings, worried and/or dreadful thoughts, and physical changes like increased blood pressure, sweating, trembling, dizziness, tension, and rapid heartbeat” (Pisarik, Rowell, & Thompson, 2017, p. 340). Among college students, anxiety is the most reported mental health issue (Pisarik et al., 2017). Physical activity has been correlated with the ability to cope with anxiety-related symptoms. The effects of exercise classes, like yoga and resistance training, been shown to have positive effects on body satisfaction and social physique anxiety in women (Gammage, Drouin, & Lamarche, 2016). For example, a yoga class and a resistance training class that were 30-minutes long were associated with, “increases in body satisfaction and decreases in social physique anxiety, whereas the resistance class led to decreases in social physique anxiety” (Gammage et al., 2016, p. 1205). Of most importance, Gammage et al. (2016) found that women who suffer from body satisfaction issues or physique

anxiety can draw positive correlations from a single session of either type of exercise training class. Yoga and resistance training vary drastically in their methods of physical activity; therefore, these results suggest that any type of physical activity can help students cope with anxiety symptoms.

Among the aforementioned symptoms of anxiety, people who suffer from generalized anxiety disorder (GAD) also report suffering from prevalent and debilitating disturbed sleep (Herring, Kline, & O'Connor, 2015). GAD is a predominantly seen in young women; however, little is known about the effects of acute exercise in the relief of GAD symptoms. GAD affects 6.8 million adults in the U.S. (Anxiety and Depression Association of America, n.d.), and more than half of college students have reported symptoms of “overwhelming anxiety” at one point while they are in college (Pisarik et al., 2017) making anxiety a resounding problem in higher education. Exercise training programs, like resistance or aerobic exercise training programs, have been correlated with improved sleep initiation and sleep continuity after six-weeks among patients with GAD ages 18 to 37 (Herring et al., 2015), reaffirming that any type of physical activity is beneficial to patients with anxiety disorders. By relying, promoting, and supporting collegiate recreation programs, higher education administrators could see improvements in students’ lives who suffer from mental health issues like anxiety (Gammage et al., 2016).

Other forms of mental health illnesses, such as depression, affect college-age students at an alarming rate. Depression is characterized as a mood disorder that can impact daily life. Symptoms of depression include decreased energy, appetite and/or weight changes, feelings of hopelessness, and thoughts of death or suicide (National Institute of Mental Health [NIH], n.d.). Suicide is the third leading cause of death among young adults ages 15 to 24 (Smith et al., 2015) and the primary reason for suicide ideation is related to depression (Anastasiades, Kapoor,

Wootten, & Lamis, 2017). Other factors like stress and emotional pain are also contributors of suicide ideation among undergraduate students. Specific to higher education, suicide is the second leading cause of death in college students (Smith et al., 2015). Weight-related issues and stress have been shown to have an impact on depressive symptoms among undergraduate students. In turn, suicidality has been predicted for students who suffer from depression. By grasping control on weight-related issues, such as obesity, the progression from depression to suicide could subside. Higher education administrators who encourage and support physical activities, exercises, and leisure recreation could begin to see an impact in mental health issues across the U.S. on college campuses.

Eating disorders are yet another common form of mental illness among college-age students. College students are at higher risk for eating disorders and body image related issues than any other age group (Shepard, Jewell, Kage, & Lynch, 2017). Furthermore, there has been a steady increase in eating disorders among college females in the last decade. In fact, in a 13-year period Shepard et al. (2017) found that eating disorders increased from 23% to 32% among college females and from 7.9% to 25% in males. The increases found by Shepard et al. (2017) indicated that there is a severe problem especially among males. Eating disorders, like anorexia nervosa, can be associated with “negative physical, psychological and psychosocial effects as well as functional impairment and reduced quality of life” (Young et al., 2018, p. 2). With a functional impairment and reduced quality of life, eating disorders have serious implications on a student’s life as well as in their academic performance. Over-exercising has been linked to eating disorders (Shepard et al., 2017), therefore collegiate recreation staff could potentially play a critical role in noticing the signs and symptoms of over-exercising in recreation centers. Exercise serves as a means to control the body; therefore, the majority of individuals with eating disorders

will engage in over-exercising more than any other eating disorder behavior. Best practices for managing overtraining (over exercise) and eating disorders in collegiate recreation are currently lacking. There is a scarcity of research between “high-risk behaviors such as eating disorders and over exercising in campus recreation” (Shepard et al., 2017, p. 3) and collegiate recreation practitioners have indicated to be knowledgeable about physical symptoms but lacked resources to manage cases (Shepard et al., 2017). Eating disorders present serious implications of bodily harm in bone density loss, loss of menstrual cycle, chronic joint pain, and increased frequencies of illness, among other consequences, and sometimes the damage could be irreversible (National Eating Disorders, n.d.). By understanding eating disorders and allocating resources for students, college administrators and educators can help students in need.

Body image disorder, a relevant factor in eating disorders, stems from a distorted perspective of one’s body shape (National Eating Disorders, n.d.). A concerning factor among college students is that as many as 80% of female students report some sort of dissatisfaction with their bodies (Murray, Maras, & Goldfield, 2016). Manifestations of emotional eating, which can be overeating or bingeing as a result of a negative emotion, are difficult to investigate as hunger and emotional arousal are not easily identified. While body image concerns are often associated with women, men also exhibit body dissatisfaction. Among women, body dissatisfaction is triggered from societal pressures of being thin, whereas for men, it is about being muscular in Western cultures (Murray et al., 2016). Social networking sites (SNS), such as Facebook and Twitter, have become a major form of communication among college students. Activity on SNS has real world implications, for better or for worse. While its original construct was centered on positive intentions, excessive use and misuse of SNS can lead to negative consequences in mental health. A relationship between SNS use and disordered eating behaviors

has been recognized among college students (Murray et al., 2016). Excessive time on SNS was positively correlated with emotional eating and decreased appearance esteem among college females. By engaging more in collegiate recreation, a form of physical activity stimulant, and less on SNS, college students are less likely to suffer from body dissatisfaction disorders (Murray et al., 2016).

Mental health illnesses can affect anyone; however, college-aged students are more susceptible due to academic and social pressures. Of the utmost attention is that counseling centers are not able to meet the growing demands of college students. Counseling center directors have reported that 88% of students may not receive timely treatment and that 35% of counseling centers have waitlists (Cornish et al., 2017). With the growing demands in mental health and rising costs in higher education, college administrators are looking for creative ways to provide resources at a reasonable cost. With physical activity being at the center of most practical impact in mental health, collegiate recreation departments are championing relief efforts in the mental health crisis of the U.S. higher education system. Through partnerships with counseling centers, collegiate recreation departments provide a practical and immediate solution to alleviate the symptoms of many mental illnesses. An example of a counseling center joining forces with a collegiate recreation program is the Healthy Eating and Assessment and Referral Team (HEART) at Virginia Polytechnic Institute and State University (Virginia Tech). By creating a team of medical providers, counselors, registered nurses, a dietitian, a fitness specialist, and a case manager, Virginia Tech is able to “prescribe” physical activity for students who have issues pertaining to eating, body image, or similar concerns (Virginia Tech, n.d.). Through the HEART program, students can find relief for symptoms of mental illnesses without the use of drug prescriptions. The HEART program advocates for physical activities to enhance

the lives of students who suffer from mental illnesses. Symptoms of mental illnesses can have a profound impact on quality of life, which can lead to decreases in academic performance.

Academic Performance and Physical Activity

In the United States, the essence of academic performance is measured with grade point average (GPA). Homework, tests, projects, and other academic assignments contribute to a student's GPA in high school and in college. Colleges and universities use GPA in the admission process, along with standardized tests scores and other factors, to predict the caliber of a student. Upon a student being admitted into a university, GPA can continue to have a substantial impact on other contributors of education. For example, the GPA of a student can have serious implications with financial scholarships and academic standing within the institution. Often, GPA can be the conclusive factor of academic success. For these reasons, GPA is a standard of measure that is important through high school and college.

While GPA is a measure of academic success, there are external factors that can impact academic performance. An example of an external factor would be obesity or overweight issues. A positive correlation between obesity or overweight issues and academic performance has been identified in students from elementary school to high school (Anderson & Good, 2017). With GPA having major implications on the status of a student at the institution, successful integration into good academic practices is key for student success. The body mass index (BMI) is the measure of body fat based on weight in relation to height and, "a high BMI can be an indicator of high body fatness" (CDC, 2018, "Body Mass Index"). Deterrent external factors, like high BMI, have also been correlated with poor academic performance among college students (Anderson & Good, 2017). By maintaining regular physical activity or an exercise routine, students can impact their overall BMI to have better academic performance. For example, the total number of visits

to the recreation center has been correlated with higher GPA. Students who utilized the recreation center often were more likely to have a higher GPA than those who used it less often regardless of their gender or academic rank (Roddy, Pohle-Krauza, & Geltz, 2017). By lowering BMI through physical activity and exercise, college students may achieve more in the classroom.

In addition to physical activity and exercise, other positive healthy behaviors can have significant impact on academic achievement. Favorable health indices, like favorable BMI and better dietary choices, have been correlated with collegiate recreation facility use and GPA. Students who are reported as moderate to high-users of campus recreation facilities were well supported to have a higher GPA and eat healthier diets (Brock, Carr, & Todd, 2015). Sustaining healthy levels of dietary measures, such as eating appropriate daily servings of fruits and vegetables, could have an academic impact on a student as well as lowering their BMI. Moreover, increased participation in collegiate recreation can also incite other favorable academic achievements, like the completion of more credits. Students who had a recreational sports membership had a 0.13 cumulative GPA increase, as well as had completed more credits, than those who did not have a recreational sports membership (Danbert, McNeil, Pivarnik, & Washington, 2014).

Although academic success is measured with GPA, factors outside the classroom can have an impact on students. By engaging in physical activities, like the ones hosted in collegiate recreation facilities, students can achieve more academically than students who do not engage in collegiate recreation. Correlations to high BMI and poor academic performance have been established; therefore, students who maintain lower BMI are more academically successful. Furthermore, students who participate in collegiate recreation have been correlated to completing more academic credits. Students who are engaged in collegiate recreation have healthier habits in

diets than students who are not engaged. In the context of collegiate recreation, participation can have numerous advantages beyond physical health for students.

RPG Efforts in Collegiate Recreation

The concept that, “a college education—or at least the credential to which it leads—has become an increasingly important tool for upward mobility in the American economy of the twenty-first century” (Brown, 2016, p. 5) has led to the development of more colleges and universities in the United States than ever before. Those who obtain a college education earn significantly more money (Brown, 2016), as college degrees have become more valuable in the workforce. Higher levels of educational attainment go beyond increases in personal earnings. Societal benefits include, “improved productivity, greater civic engagement, better long-term health, and reductions in ‘social costs’ such as crime, delinquency and incarceration rates” (Percy & Svenson, 2016, p. 147). Furthermore, positive effects of higher education attainment have been measured in health, democratic governance, political participation, technological abilities, and entrepreneurial capacities. Overall, higher education is a construct that leads to benefits at the individual and societal level, as it builds on the capacities of people and promotes growth in economic, social, and political activities.

Recruitment

During the recruitment process, higher education administrators highlight services and facilities that are of interest to the student. With nearly eight million high school students participating in school athletics, sports and extravagant sporting facilities are often at the center of recruitment practices. However, a mere 480,000 of incoming students (about 6%) will compete at the varsity level when they attend college (National Collegiate Athletic Association [NCAA], 2016). In many cases, collegiate recreation can be an optimal alternative for students

who are not going to participate at the varsity level but wish to stay active in their respected sport. Disengaging in a sport can result in a significant loss for the student athlete as, “a negative change in the ability or opportunity to participate in sports and fitness activities can be particularly devastating to those with high levels of athletic identity” (Helms, 2010, p. 8). In fact, interscholastic sports are thought to be the most important activity in high schools (Gayles & Baker, 2015); therefore, transitioning from high school to college can be difficult for students who have high athletic identity but are not able to compete at the varsity level. With most incoming students not participating at the varsity level in sports during their time in college, collegiate recreation can serve as a recruitment tool by providing facilities for the student to continue to engage in their high school sport. Furthermore, collegiate recreation can provide an outlet for students coping with sport loss.

Transitioning from high school to college is filled with uncertainty, anxiety, and excitement for all students. High school students who play sports have demonstrated the ability to perform better academically, dropout less frequently, are more interested in college, and overall report positive educational experiences (Gayles & Baker, 2015). While all incoming college students face major challenges, such as balancing academics and social roles, students who transition from high school to college without fulfilling their athletic identity can also experience loneliness and stress. Schlossberg’s theory of transitioning identified the 4S’s to cope through the difficult transition by examining the self, situations, strategies, and supports (Patton, Renn, Guido-DiBrito, & Quaye, 2016). Participation in collegiate recreation presents an opportunity for students to fulfil their athletic identity. Furthermore, participation in sports has been linked to developments in other domains, such as identity, multicultural, moral and

cognitive, and leadership development (Gayles & Baker, 2015). With proper balance of participation in sports, students can ease the transition process from high school to college.

While there are more students attending college today, there is a “declining trend of men attending college” (Weaver, Forte, & McFadden, 2017, p. 42). This downward spiral of college attendance by men requires attention and specific recruitment strategies to attract male students. With many college-bound athletes being displaced from their high school sport, collegiate recreation presents an opportunity to continue play through club sports. A club sport is, “a group of students that are voluntarily organized to further their common interests in an activity through participation and competition” (Lifschutz, 2012, p. 106). Club sports provides a competitive sporting opportunity at the local and national level for college students to fulfill their athletic potential. At the recruiting level, club sports have been found to have a recruiting niche that could foster, “a great connection for those men who know they are not going to participate in intercollegiate athletics after high school but want to continue to play competitive sports” (Weaver et al., 2017, p. 47). For these student athletes, collegiate recreation departments can play a crucial role in recruitment, as the ability to continue to play their sports has a big impact in their education attainment.

Retention, Progression, and Graduation

RPG rates are among many indicators of institutional and student success; however, to date, institutions of higher education are still without a *magic formula* for ensuring success for all students. By understanding the needs and wants of the student, higher education administrators can implement better practices to improve RPG rates. Collegiate recreation participation can be a source of influence in a student’s persistence in college. While dropout rates can be linked to lack of involvement in campus activities (Astin, 1984), participation in collegiate recreation can

be a tool in the dismantling of attrition rates as it creates a sense of belonging and exploratory opportunities for students to become more engaged. In fact, 66% of collegiate recreation sports (CRS) program participants and 73.9% of CRS facility users placed a significant level of importance in their decision to continue at their institution (Forrester, 2015). Furthermore, a 5.9% higher retention rate has been shown among first-time in college students who participate in intramural programs (McElveen & Rossow, 2014). The positive correlation to retention is linked to, “the role collegiate recreation programs play in improving students’ sense of belonging and positive interactions with other students” (McElveen & Rossow, 2014, p. 53).

The sense of “school belonging” has been found to be an important contributing factor in psychological adjustment for college students (Gummadam, Pittman, & Ioffe, 2016). Sense of community (SOC) among college students is the “feelings of connectedness that a person may feel as a result of being a part of a larger group” (Phipps, Cooper, Shores, Williams, & Mize, 2015, p. 105). Additionally, all members of the group share an emotional connection to common beliefs, values, and experiences. SOC can be conceived as a social connectedness framework that contributes to student development and growth. Participation within intramurals sports has been shown to have significant increases of overall SOC in college students (Phipps et al., 2015). Retention is closely related with SOC development within the first year. Experiences and opportunities in the first year have a deep impact in subsequence persistence, as the, “largest proportion of institutional leaving occurs with that year and prior to the beginning of the second year” (Tinto, 1993, p. 14). For this reason, the first year becomes objectively important for college administrators.

Collegiate recreation has bountiful and ever-changing programs that allow for further SOC development. Outdoor recreation is a component of collegiate recreation that is centered

around the exploration of nature and team building. Outdoor orientation programs (OOP) have been linked in the development of SOC among first year students (Howard, O’Connell, & Lathrop, 2016). Furthermore, students who participate in OOP have better community development, transitional value, and institutional affiliation. OOP has also been linked with participants developing a deep relationship with OOP trip-leaders, a “family feeling” with a tight knit community, and a “profound and transformative” experience in their lives (Howard et al., 2016, p. 50). Outdoor recreational programs help students form bonds of community and feel more integrated to the university. As a critical factor in retention, SOC is interwoven into the fabric of collegiate recreation participation.

The transition period between leaving the family home and going to college can be difficult for students. As they explore their new-found independence, healthy practices may not be intuitive for students, as these may have been managed by parents while living at home. Formally learning healthy practices in the classroom can help students in navigating the transition between high school and college. Additionally, learning about healthy living in the classroom plays a significant role in retention of students. In fact, for-credit courses centered around healthy lifestyles have improved retention rates among college freshmen. With only 4.8% of college students eating five or more servings of fruits and vegetables and 19.4% reporting 30-minutes of daily physical activity (Melnyk, Kelly, Jacobson, Arcoleo, & Shaibi, 2014), proper education in healthy practices is fundamental in the health of college students. Moreover, students who enroll in healthy lifestyle academic courses have been shown to have a 94.1% retention rate (freshman year to sophomore year), whereas those who do not enroll in such academic classes display only an 83.8% retention rate in the same time period (Melnyk et al., 2014). Formally learning about healthy practices, such as physical activity and a balanced diet,

are inextricably connected to retention and academic success. By the time students are in their last year of college, physical activity patterns sustained in college can be a strong predictor of physical activity after graduation (Melnyk et al., 2014).

The American higher education system has become acceptant of a graduation measure that is creating a major problem. Over the past two decades, four-year colleges have accepted a six-year time frame as an adequate measure for graduating “on time” (Complete College America, 2014). Moreover, in the last 10 years four-year completion rates have declined to less than one-third in full-time degree-seeking students (Davidson, 2014). A major contributor of the four-year completion decline rate is low credit enrollment. Most bachelor’s degrees require 120 credits for graduation, which indicates 15 credits for two semesters—or 30 credits per year—in order to graduate in four years. However, students often enroll in as little as 12 credits per semester and that is where the discrepancy is found in “on-time graduation rates.” Students who regularly participate in collegiate recreation are more likely to complete more credits (Brock et al., 2015; Danbert et al., 2014) than their peers who do not participate in collegiate recreation. Graduating within a four-year time frame can have significant financial implications for students and their families, therefore collegiate recreation participation may have implications on graduation rates.

The time that a student takes to graduate, time to degree, can be defined in two ways. The first way is called *elapsed time* or calendar years that it may take a student to complete the degree without distinguishing stop-out time. Elapsed time is defined, “as time to degree, progress to graduation is viewed in an open system, in which a university functions as one of the interacting components that shape a student’s life” (Yue & Fu, 2017, pp. 185-186). The second way to define time to degree is by only counting enrollment in terms of school semesters or

quarters. More specifically, the focus is on the, “enrolled time to determine what contributed to the term-by-term progress to degree completion” (Yue & Fu, 2017, p. 186). With the high rises in cost for college, the more time that a student spends seeking a degree, the more money he or she will spend. The debt in student loans has now surpassed the trillion-dollar mark (Complete College America, 2014), which continues to add to the national debt. These financial constraints have the potential to stifle families and can lead to increase dropout rates.

Student retention has many factors, some which are external to the university environment, like family needs or health issues. However, in general, if a student is satisfied, he or she is more likely to be invested in the institution thereby progressing and concluding their college journey at graduation. Students who use collegiate recreation are more likely to see benefits of health and create SOC within their institution. Creating and sustaining SOC is a major factor in retention and progression, as the student feels supported and guided throughout their college career.

The benefits of collegiate recreation participation are multi-layered; therefore, it is no surprise that students who participate in collegiate recreation feel more connected to the university and, therefore, are more likely to have higher RPG rates. Through collegiate recreation participation, students can play and create relationships among each other. Collegiate recreation fosters an environment for students to create SOC, therefore attrition rates are seen less within students who participate and engage in these activities (Phipps et al., 2015). Through collegiate recreation participation, students can become engaged with other peers and elevate their SOC to persist in their higher education endeavors. Students with high SOC create affinity for the university, as they are invested in a community that provides support and care. Students with

high levels of SOC form relationships with caring mentors and devote more time and energy at the institution (Astin, 1984; Phipps et al., 2015).

Theoretical Framework: Theory of Student Involvement

To properly frame the present study, Astin's (1984) theory of involvement will be utilized as the construct to conceptualize and guide the research. This theoretical approach is the most appropriate, as it has a specific relationship with the variables being studied. A theory, "helps to explain (or predict) phenomena that occur in the world" (Creswell, 2009, p. 51), as well as provide a lens to view the study. The theory of involvement indicates that a major factor of persistence is student involvement in various capacities on campus (Astin, 1984).

The theory of student involvement emphasizes active participation and engagement in the student learning process to arrive at the *how* of student development rather than the *what* of student development. "The theory of student involvement argues that a particular curriculum, to achieve the effects intended, must elicit sufficient student effort and investment of energy to bring about the desired learning and development" (Astin, 1984, p. 301). Rather than *motivation*, which implies a psychological state without behavioral manifestations, the theory of involvement specifically identifies *involvement* as, "the amount of physical and psychological energy that the student devotes to the academic experience" (Astin, 1984, p. 297). Moreover, the involvement as a construct is more useful in practice for administrators as the question, "*how do you motivate students?*" is far more difficult to answer with concrete evidence than "*how do you get students involved?*"

The Five Postulates

Astin's (1984) theory of involvement is developed around five basic postulates (*see Figure 1*). The theory of involvement identifies the five postulates as: involvement as an

investment of physical and psychological energy; involvement occurring along a continuum; involvement as qualitative and quantitative; learning while involved is related to quality and quantity of involvement; and, academic performance being correlated to involvement. Through the five postulates, behavioral components and educational learning outcomes are conveyed suggesting that involvement is foundational to student success. Furthermore, the theory of involvement presents traditional pedagogical theories, resources for practical attainment of involvement, and specific areas within higher education for involvement.

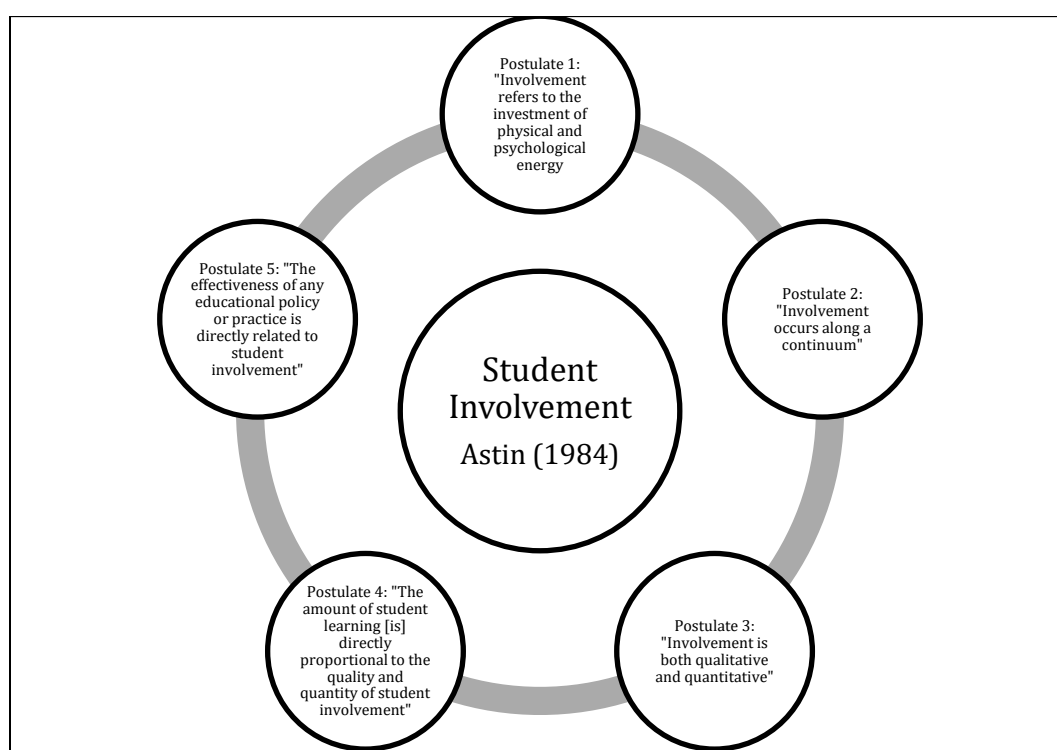


Figure 1. Astin's (1984) theory of involvement postulates.

Traditional Pedagogical Theories

Most traditional pedagogical theories identify students as a *black box*, suggesting that students are mechanisms of input (university policies and regulations) on one end, and output (achievement measures such as GPA or scores on standardized tests) on the other end. The theory of student involvement describes a unifying construct of environmental factors for

practical implementation and serves as the missing link between traditional pedagogical approaches and desired learning outcomes. Furthermore, involvement is identified in various capacities through quality and depth. For example, academic involvement through undergraduate research, collaborative assignment and projects, and learning communities can provide deep learning and personal gains for the student. Through this involvement, students can have an impact on the campus communities with greater knowledge.

The unifying construct in the theory of student involvement is found in the role of the educator and the student. By focusing less on what the educator does and more on what the student can do, learning and development will emerge. Educators do not have to be professors; instead, they can be a variety of administrators, including collegiate recreation practitioners. By understanding the intrinsic nature of the theory of student involvement, administrators and faculty members alike can work together to facilitate the learning process of a student.

Time as a Resource

Fiscal resources and other material possessions can be difficult to allocate at institutions; however, the theory of involvement suggests that the most precious resource on a college campus is the student's time. Students who invest time and are involved in athletic activities, such as collegiate recreation, can be impacted in four areas: academic reputation; intellectual environment; student friendships; and, institutional administration (Astin, 1984). Time, however, is a resource that both administrators and students must understand has limitations. Therefore, time devoted by students should be invested in opportunities that will help the student grow.

Time devoted, both physically and intellectually, is limited for students. In order to prioritize academic pursuits, college administrators must recognize institutional practices that can have significant effects on students' time and energy. By aligning practices with university

administrators, collegiate recreation practitioners can advocate for ways to minimize barriers to physical activity. For example, within the decision to build a new recreation center, the physical location should be considered to minimize barriers of transportation or accessibility. A recreation center that is built away from the student population can imply a significant amount of time that the student must travel. With the understanding that time is a limited resource, university leaders must work together to fulfil the needs of students and to make the best decisions to minimize time constraints which can pose as barriers for involvement.

Areas of Involvement

Involvement, as described by Astin (1984), lies on a continuum where dropping out is on the low-end (uninvolved) and persistence is on the high-end (involved) of the continuum. Astin (1984) described specific forms of involvement that are associated with greater than average changes. For example, place of residence, honors programs, academic involvement, student-faculty interactions, athletic involvement, and involvement in student government have significant effects on students and their affinity to the university.

Of all environmental factors, the place of residence for students is listed as the most important and pervasive environmental factor (Astin, 1984). Those who live on-campus have higher retention rates and more opportunities to get involved. Unlike commuters, students who live on campus achieve more leadership in extracurricular activities and participate in athletic-like events, such as collegiate recreation. Collegiate recreation participation has been associated with impacting four areas: academic reputation, intellectual environment, student friendships, and institutional administration (Astin, 1984).

While there are other areas that impact student involvement, such as honors programs and student government, “student involvement refers to the quantity and quality of the physical and

psychological energy that students invest in the college experience (Astin, 1984, p. 307). The theory of involvement deviates the attention from technical implementations and focuses on the time and energy that will create opportunities for the student learning process. By using the theory of involvement as frame of reference, college administrators at all levels of the institution can achieve one common objective without becoming overly complicated in the mechanical aspects of implementation.

Chapter Summary

In this chapter, evidence was presented on the impacts of participation in collegiate recreation on college students. Collegiate recreation has a rich history that dates back to the mid-1800s. Today, NIRSA: Leaders in Collegiate Recreation serves as the governing body for collegiate recreation in the U.S. and Canada. The effects of collegiate recreation can be seen in student development and in practices to improve RPG rates among college students. Grounded on Astin's (1984) theory of student involvement, collegiate recreation can be an impactful program for physical and mental health and academic performance.

Physical activity is presented as a necessary implementation for healthy bodily functions. Cognition and systems in the body are found to be less efficient in those who lead inactive lives; therefore, increases in physical activity can minimize health risks in the future. Like body functions, mental health illnesses such as anxiety, depression, and eating disorders are positively affected by physical activities. Students who participated in collegiate recreation, exhibited increases in GPA (Roddy, Pohle-Krauza, & Geltz, 2017), felt more connected to the university, and demonstrated higher RPG rates. Affinity for sports and physical activity presents a unique opportunity for students to create SOC and belonging.

CHAPTER III

METHODOLOGY

The purpose of this study was to investigate if a relationship existed between student participation in collegiate recreation and student retention, progression, and graduation (RPG) rates at a research-intensive university in the Southeast United States. This chapter describes the methodology designed to answer the overarching question on the relationship between RPG rates and participation in collegiate recreation. Specifically, the present study focused on the following research questions:

1. Does participation in collegiate recreation predict retention?
2. What is the relationship between participation in collegiate recreation and students' progression and graduation?

A positive correlation between collegiate recreation participation and RPG rates would strengthen the field of collegiate recreation, as well as serve as an indicator that recreational departments are a meaningful resource in the endeavors for improvements of RPG rates among college students. The literature is robust with theories, philosophies, and approaches about RPG rates, yet collegiate recreation has not been highlighted as a major resource. Currently, there is momentum in the advances of health and well-being in higher education as it pertains to academic achievement (American College Health Association, n.d.; Bradley & Green, 2013; Larson, Orr, & Warne, 2016). This momentum should be met with support and the present study can help bridge the gap in the literature and the conversations surrounding collegiate recreation participation and its relationship with RPG rates.

To date, higher education administrators do not have a *magic formula* for the improvement of RPG rates in college students. With the high costs associated with higher education, research is needed to understand factors that may affect RPG rates within higher

education. This chapter is organized into seven sections: research design, which includes: population, sample and sampling, instrumentation, data collection and data analysis. Consequent sections include: reporting the findings, and limitations, delimitations, and assumptions.

Research Design

To determine the influence of collegiate recreation participation on students, an ex post facto research design was utilized. Ex post facto, meaning *after the fact*, is the most relevant approach to answer the research questions of the present study due to the narrow-angle lens (Gay & Airasian, 2003) that it provides within the population being studied. While other approaches could have been considered for this study, the nature of ex post facto design will provide tightly controlled conditions to understand the relationship between participation in collegiate recreation and RPG rates (Charles, 1998). Determining a relationship between collegiate recreation participation and RPG rates could be useful in making predictions for future students in academic success and degree attainment.

For this study, ex post facto research design was the most appropriate design due to the inability to manipulate the independent variables and the constraints of time. While ex post facto research design does not establish cause-effect relationships between variables (Charles, 1998), it does provide important educational research. For the field of collegiate recreation, educational research can prove to be a valuable tool as the field continues to expand.

Population, Sample, and Sampling

This study did not have a true sampling procedure due to the nature of the data collection. Archival data were collected from Institutional Research (IR) after Institutional Review Board (IRB) approval was granted. Data for the incoming first year students in 2011 were analyzed through 2017. IR defined an incoming freshman as, “fall term, first-time, full-time, degree-

seeking undergraduates. The cohort includes students enrolled in the fall term who attended first time in the prior summer term, and students who entered with advanced standing (college credits earned before graduation from high school). Students who graduated from high school within the same calendar year of the fall term are included even if they previously attended college” (Institutional Research, 2018).

The study focused on the population of the incoming freshman class from the fall of 2011 at a research-intensive university in the southeast of the United States. IR provided data for 3,516 students who were classified as first year incoming freshmen in the fall of 2011. Data of the 2011 cohort were analyzed until 2017 due to the proximity of their anticipated graduation semester—spring of 2017. A six-year and a four-year graduation time frame were analyzed to determine if the independent variable of collegiate recreation participation was a factor on graduation. Academic years 2011 through 2017 were analyzed for retention, progression, and graduation rates for the same cohort of students.

The sample for the present study was students within the 2011 cohort who swiped into the Recreation Activity Center (RAC) at least one time. Students who did not swipe into the RAC at least once were omitted from the study, as it was impossible to identify collegiate recreation participation for those students. In the “Limitation, Delimitations, and Assumptions” section of this chapter, participation outside the RAC is addressed.

Instrumentation

The present study analyzed archival data that were collected as part of student documentation at a university in the Southeast United States. Due to the nature of the data, there was no instrument implements, nor was there any interaction with participants for this study. The

de-identified data of the first-year incoming cohort was gathered from the IR and then analyzed using Statistical Package for the Social Sciences (SPSS).

In the present study, collegiate recreation participation served as the independent variable. Participation was determined as *low participation* and *high participation* for students who engaged in collegiate recreation based on the median visits in a given academic year. Retention and progression served as the dependent variables that were correlated with participation in collegiate recreation and they were tracked by academic years—fall semester enrollment to the following fall semester enrollment. The average participation within a four-year, 5-year, and 6-year time determined *low participation* and *high participation* for students who engaged in collegiate recreation to analyze graduation rates.

Data Collection

To ensure the success of this study, it was important to establish a connection with IR in the early stages of this study. Contact was established with department Director at the time (personal communication, November 4, 2016) to discuss the feasibility and logistics of the present study. A letter of cooperation was drafted and ratified by Campus Recreation and Intramurals (CRI), IR, and the researcher to ensure that personnel changes did not affect the collection of data.

While IR persisted with personnel changes, it also encountered other organizational changes. A university consolidation and departmental re-organization took place throughout the study. These changes did not affect the timing of the collection of the data; however, other aspects of the study were affected, which are discussed in the “Limitations, Delimitations, and Assumptions” section of this chapter. Data were collected as scheduled in the fall of 2018 from IR by the researcher.

The data set provided by IR contained entry swipes in to the RAC electronically recorded by CRI, enrollment and class standing status from year-to-year, and graduation rates. Other demographic data, such as overall GPA and gender were also provided in the data set (see Appendix A). Throughout the present study, the researcher did not have any contact with the participants, as only de-identified student data were analyzed to ensure that Family Educational Rights and Privacy Act of 1974 (FERPA) and Health Insurance Portability and Accountability Act of 1996 (HIPPA) laws were met and IR created new identification numbers to keep students unidentifiable for security purposes.

Data Analysis

The present study used binary logistic regressions to analyze the data. The dependent variables—retention, progression, and graduation—were provided by IR as dichotomous variables (yes no). Collegiate recreation participation was provided as a continuous variable, as it represented the number of times a student entered the RAC. The median RAC entries were established for each academic year. The median was thought to be the best indicator for participation, as it was influenced by a high and low distribution (Salkind, 2010). Once the median for each academic year was established, the cohort was assigned into *low participation* or *high participation* category depending on how many visits they had in the academic year being examined.

Retention was analyzed from the fall of 2011 until the following fall in 2012, as retention only is characterized as enrollment from the entering fall semester to the following fall semester. To analyze participation in collegiate recreation, the median participation in the 2011-2012 academic year was 28 RAC visits. Therefore, the threshold for *low participation* was set at a

maximum of 27 RAC visits and the threshold for *high participation* was set at a minimum of 28 RAC visits. Students who did not have RAC visit data were omitted from the present study.

Progression was analyzed from the fall of 2012 through the fall of 2017. The median for collegiate recreation participation was established for each academic year. Like retention, the threshold for *low participation* was set as one visit less than the median as maximum and the median number of visits was set as the minimum threshold for *high participation*. Table 1 describes the thresholds for *low participation* and *high participation* for each academic year.

Table 1. Progression and RAC Participation

Academic Year	Median Participation	<i>Low participation</i> <i>n</i>	<i>High participation</i> <i>n</i>
2012-2013	23	1,279	1,227
2013-2014	24	995	1,017
2014-2015	23	859	860
2015-2016	14	451	464
2016-2017	10	158	159

Graduation rates were analyzed for the cohort within four-years, five-years, and six-years for the cohort chosen. The average collegiate recreation participation was measured for each time frame (see Table 2). The threshold for *low participation* was set as one visit less than the average as maximum and the average number of visits was set as the minimum threshold for *high participation*.

Table 2. Graduation and RAC Participation

Academic Year	Median Participation	<i>Low participation</i> <i>n</i>	<i>High participation</i> <i>n</i>
4 Year Graduation	25	382	521
5 Year Graduation	22	643	906
6 Year Graduation	20	636	1,081

Reporting of Findings

The findings of the present study will be discussed in the following chapter. The overarching question and the specific research questions will be addressed. Each research question will be answered separately using a narrative summary with supporting evidence in a tabular format for better understanding. Furthermore, the findings will be presented with statistical and practical effect sizes, as it relates to the dependent variables, for each of the analysis conducted in the present study. The selected alpha level for all statistical analysis was .05. The following chapter will address the research design in the context of the findings, the respondent's demographic and descriptive information, and a factual report of the data gathered.

Limitations, Delimitations, and Assumptions

This study had two major limitations. The first limitation of this study was the research design. The only research design suited for this study was ex post facto. While the tightly controlled variables could not be manipulated by the researcher, this research method design has some shortcomings. Although the data were provided from a prestigious department with impeccable records, there is no way of knowing for sure if the data is absolutely correct, as the researcher only obtained de-identified data and participants were not contacted. While an ex post facto research design is not free from limitations; however, many advantages can be drawn from this type of research design. Ex post facto can explain the consequences of an antecedent

condition and determine the influence of a variable on another variable. According to Salkind (2010), “contrary to true experimental research, ex post facto research design looks first to the effects (dependent variable) and tries afterward to determine the causes (independent variable)” (p. 124). The lack of control over the independent variables and the nonrandom selection of the participants are the key components of ex post facto research design (Salkind, 2010). These key components of ex post facto research design can be suitable and appropriate, or they can be seen as a weakness or a shortcoming in the research design (Charles, 1998). A limitation to ex post facto research design is that internal validity can be threatened, and confounding errors cannot be detected by the researcher and, “as a consequence, the researcher may not be sure that all independent variables that caused the facts observed were included in the analysis” (Salkind, 2010, p. 124).

The second limitation was the reconfiguration of the data. While IR was able to provide the data to conduct the study, it was not presented as originally requested. The original request consisted of semesterly enrollment to analyze enrollment rates. Semesterly enrollment was thought to be more precise when observing retention and progression. These rates were going to be compared with collegiate recreation participation to understand the effects of participation on enrollment on a semester basis, as there could have been differences indicated by the timing of the semester. Semesterly enrollment could have provided a greater insight to the retention and progression rates; however, an academic year was used instead. Due to the organizational changes endured at IR during the course of the present study, systems and processes did not align with the original request.

The present study was delimited in two ways. The first delimitation of this study was the classification of collegiate recreation participation within the students who accessed the

RAC. The present study was delimited in that it did not account for those who engaged in physical activities outside the RAC. Only those who physically swiped their identification card at the RAC were accounted as participants of collegiate recreation for the present study. This does not include participants who utilize the outdoor facilities as a means of recreation. For example, the use of the running trail at University Park is an entity of the RAC, however it is accessible without credentials by anyone at any time. Other official sites of CRI include the Golf Course and intramural sports, which is not included in the present study. Additionally, participants of the present study who attended off-campus fitness centers or gyms were not included in the analysis of this research. Due to logistics, it was not possible to include participants who did not enter the RAC but did engage in physical activity through other means. Lastly, it is important to note that many off-campus housing facilities are designed specifically for students and they include recreation or fitness facilities. There could have been many more participants that were not captured in this study. The second delimitation of this study was the population. Only those within the cohort chosen, incoming first-year student in 2011, were analyzed for collegiate participation and their RPG rates.

An assumption made in the present study is that students who swiped into the RAC participated in collegiate recreation activities. While that assumption can be true, there is no way to know if the student who entered the RAC was there to engage in physical activity for any other reason that does not include physical activity. An example of entering the RAC without the intent to engage in physical activity could be to attend a meeting. The present study aimed at establishing a relationship between physical activity and its positive contributions to the improvement of RPG rates. While there were limitations, delimitations, and assumptions in the

present study, valuable and educational data were gathered that can be generalized for other populations of students at different institutions.

Chapter Summary

The aim of this study was to understand the relationship between collegiate recreation participation and RPG rates. Using an ex post facto research design approach, data were collected on identified incoming freshmen students in the fall of 2011. A six-year time frame was chosen to observe graduation rates. Archival data were collected from IR in the fall of 2018.

In the present study, the dependent variables of retention, progression, and graduation were analyzed using binary logistic regressions. The independent variable of collegiate recreation participation was determined by the median RAC visits for each academic year. A median was used as it was determined to be a better indicator by a high/low distribution.

This study is not free from limitations. Two major limitations impacted the study. The first limitation was the research design. No research design is free from limitation, however ex post facto presented unique limitations to the study. The second limitation was found within the organizational changes endured by IR during the time of the study. While the impact was minimal, the study was not conducted as originally planned.

The study also had two delimitations. The first delimitation was found in the classification of collegiate recreation participants. The study did not include participants from other fitness centers or gyms due to logistical implications. The second delimitation was found in the population of the study. The study only analyzed incoming first-year students of a cohort in 2011 at a research-intensive university in the Southeast United States.

CHAPTER IV

REPORT OF THE DATA AND DATA ANALYSIS

The purpose of this study was to investigate if a relationship existed between student participation in collegiate recreation and student retention, progression, and graduation (RPG) rates at a research-intensive university in the Southeast United States. Through the present study, collegiate recreation is presented as a viable resource in the efforts of improving RPG rates in the higher education system of America. RPG rates have become a top priority in the higher education system, as declines have been recognized (U.S. Department of Education, 2017). Many practices and efforts have been created and implemented to increase RPG rates among college students; however, collegiate recreation has not been featured as a major resource in the improvement of RPG rates. Aiming to explore the influence of collegiate recreation participation in the improvement of RPG rates, the present study sought to gather data on an incoming first-year cohort to analyze their RPG rates and participation in collegiate recreation.

Data on retention, progression, graduation, and collegiate recreation participation, as well demographic data on gender and overall GPA, were gathered on an incoming first-year cohort of the fall of 2011. Using binary logistic regressions as a statistical form of analysis, collegiate recreation participation was measured to understand its impact and effect on RPG rates. The present study had a population size of 3,516 students, however only students with at least one entry into the Recreational Activity Center (RAC) were included in the analysis of this study. The present study answered the following research questions:

1. Does participation in collegiate recreation predict retention?
2. What is the relationship between participation in collegiate recreation and students' progression and graduation?

Research Design

An ex post facto, or *after the fact*, research design was chosen for the present study. This quasi-experimental design was chosen to examine the independent variable, in the case of the present study, collegiate recreation participation, and its effects on the dependent variables (retention, progression, and graduation rates). In this research design, “the researcher takes the dependent variable (the fact or effect) and examines it retrospectively in order to identify possible causes and relationships between the dependent variable and one or more independent variables” (Salkind, 2010, para. 2). This research design was chosen as it was not practical or ethical to manipulate the independent variable.

In an ex post facto research design, the effects of the dependent variable are first seen and afterwards the independent variable is analyzed to examine the predictors. With this type of research design a pilot study was not suited; therefore, it was not conducted. Furthermore, the data were archived by Institutional Research (IR), therefore sampling of the population was not needed. While the ex post facto research design does not establish cause-effect relationships, its educational research value is supported in the higher education field.

Respondents

The intended population for this study was the incoming first-year class in the fall of 2011 at a research-intensive institution in the Southeast United States. The archival data from IR contained data from 3,516 students. The sample of this study were students within the cohort chosen with at least one entry into the RAC in a given academic year. Students within the cohort who did not have at least one entry into the RAC in the academic years that were analyzed were excluded from the present study. Within the cohort, there were 1,682 females and 1,834 were males.

Findings

The present study analyzed data from the incoming first-year cohort in the fall of 2011 with a population of 3,516 students. Retention, progression, and graduation rates served as the dependent variables and participation in collegiate recreation served as the independent variable in the present study. Binary logistic regressions were conducted for all analyses. The findings are reported in the following sections followed by a discussion. Tables are also included.

Retention

Retention was measured in the incoming first-year cohort from the fall of 2011 through the following fall in 2012. Within the academic year, collegiate recreation participation ($n=3,394$) was analyzed for retention rates. In this analysis, cohort members were classified as *low participation* ($n=1,670$) and *high participation* ($n=1,724$). Using a binary logistic regression and a 95% confidence interval, collegiate recreation had statistical significance ($p<.0001$) in retention rates (see Table 3). Furthermore, the analysis revealed a practical effect size with an odds ratio with a coefficient of 1.69 and within a 95% confidence interval [1.43, 1.99].

Table 3. Retention and RAC Participation 2011-2012

	<i>n</i>	Wald	<i>df</i>	<i>p</i>	<i>OR</i>	95% <i>CI</i>	
						Lower	Upper
RAC Participation	1,724	39.14	1	<.0001*	1.69	1.43	1.99

Note. *OR* = odds ratio, *CI* = confidence interval, * $p<.0001$

Discussion. The findings suggest that collegiate recreation statistical and practical effects on the cohort. The results of the binary logistic regression found that those who were classified as *high participation* had a statistical significance at the .0001 level or 99% confidence. Statistical

significance does not indicate practical significance; therefore, the practical effect sizes were also reported as odds ratios. Practical effect sizes established that participants with *high participation* were 1.69 more likely to continue into the second year than those who were classified as *low participation*.

Progression

Progression was measured in the cohort from the fall of 2012 through the fall of 2017. Collegiate recreation participation was established for each academic year and a binary logistic regression was conducted for each academic year. The confidence interval was set at 95% and each academic year was reported (see Table 4). Academic years 2012-2013 and 2016-2017 indicated a statistical significance ($p < .0001$) with an odds ratio of 1.79 [1.47, 2.17] and 1.60 [1.37, 1.87] respectively. In the 2012-2013 academic year, *low participation* ($n=1,279$) and *high participation* ($n=1,227$) were established for the cohort members. *low participation* ($n=158$) and *high participation* ($n=159$) were also established for the academic year 2016-2017.

During academic years 2013-2014 and 2015-2016 indicated a statistical significance ($p < .05$) with effect sizes of 1.38 [1.06, 1.79] and 1.51 [1.08, 2.10] respectively. In the 2013-2014 academic year, *low participation* ($n=995$) and *high participation* ($n=1,017$) were established for the cohort members. *low participation* ($n=451$) and *high participation* ($n=464$) were also established for the academic year 2015-2016.

The academic year of 2014-2015 was found to be statistically significant ($p < .05$) in favor of *low participation*. In this academic year, *low participation* ($n=859$) and *high participation* ($n=860$) were also established.

Table 4. Progression and RAC Participation 2012-2017

	<i>n</i>	Wald	<i>df</i>	<i>p</i>	<i>OR</i>	95% <i>CI</i>	
						Lower	Upper
2012-2013	1,227	33.95	1	<.0001**	1.79	1.47	2.17
2013-2014	1,017	6.08	1	.014*	1.38	1.06	1.79
2014-2015	860	7.98	1	<.005*	.760	.629	.920
2015-2016	464	5.95	1	.015*	1.51	1.08	2.10
2016-2017	159	36.01	1	<.0001**	1.60	1.37	1.87

Note. *OR* = odds ratio, *CI* = confidence interval, * $p < .0001$, ** $p < .05$

Discussion. While the confidence interval was set at 95%, the analysis revealed that two academic years, 2012-2013 and 2016-2017, were statistically significant at the .0001 level or with 99% confidence. With a 99% confidence level it can be concluded that collegiate recreation has a significant impact on students in the sample during their second and sixth year of college. In these academic years, practical effect sizes were also reported as odds ratios. In 2012-2013, cohort members were 1.79 more likely to progress if they were classified a *high participation* than those who were classified as *low participation*. Similarly, in the academic year of 2016-2017, cohort members who were classified as *high participation* were 1.60 more likely to progress, then cohort members who were classified as *low participation*.

In the academic years of 2013-2014 and 2015-2016, statistical significance was found at the .05 level or 95% confidence. Since statistical significance does not indicate practical significance, practical effect sizes were also reported as odds ratios. In the 2013-2014 academic year, participants in the category of *high participation* were found to be 1.38 more likely to

progress than those with *low participation*. Likewise, academic year 2015-2016 participants classified at *high participation* category were 1.51 more likely to progress than those categorized as *low participation*.

Finally, academic year 2014-2015 was found to be an anomaly, as the results were contradictory in comparison to the other academic years. *low participation* was found to be a better predictor of progression, as the odds ration [.760] indicated that *high participation* was not statistically significant.

Graduation

An average participation in collegiate recreation was gathered for the cohort and graduation time frames were set as: four-years from 2011-2015 ($n=521$), five-years from 2011-2016 ($n=906$), and six-years from 2011-2017 ($n=1,081$). The statistical significance and odds ratios were reported (see Table 5). Binary logistic regressions and a confidence interval of 95% revealed a statistical significance ($p<.0001$) and practical effect sizes of 1.60 (four-years), 1.45 (five-years), and 1.55 (six-years).

Table 5. Graduation and RAC Participation in Four Years, Five Years, and Six Years.

	<i>n</i>	Wald	<i>df</i>	<i>p</i>	<i>OR</i>	95% <i>CI</i>	
						Lower	Upper
4 Years	521	36.01	1	<.0001**	1.60	1.37	1.86
5 Years	906	28.60	1	<.0001**	1.45	1.27	1.67
6 Years	1,081	39.78	1	<.0001**	1.55	1.35	1.78

Note. *OR* = odds ratio, *CI* = confidence interval, ** $p<.0001$

Discussion. While a 95% confidence interval was set, the results of graduation in respect to collegiate recreation participation demonstrated a statistical significance at the .0001 level or 99% confidence. Each graduation time frame analyzed also indicated practical effect sizes. Cohort members classified at *high participation* were 1.60 times more likely to graduate with a four-year time frame than those in the *low participation* category. Regarding graduation in a five-year time frame, *high participation* cohort members were 1.45 times more likely to graduate in five years, than those in the *low participation* category. Finally, *high participation* cohort members, were 1.55 more likely to graduate within a six-year time frame, than those with *low participation*.

Response to Research Questions

Each research question was addressed with separate statistical analysis. The overarching question investigated if collegiate recreation participation predicted RPG rates in an incoming first-year cohort. The results of logistic regression demonstrated statistical significance and practical effect sizes. To further establish and denote the relationship between collegiate recreation participation and RPG rates, each research question is answered and discussed in the following sections.

Research Question 1. Does participation in collegiate recreation predict retention?

There was a statistical significance for participants of the present study who were categorized as *high participation* in retention. In addition, students who participated in collegiate recreation were found to be 1.69 times more likely to be retained within the cohort examined. The literature indicates that participants of collegiate recreation are more likely to be retained (McElveen & Rossow, 2014) and the present study reaffirms this concept.

Research Question 2. What is the relationship between participation in collegiate recreation and students' progression and graduation?

The present study found statistical significance in favor of progression for participants who were classified as *high participation* in four out of five academic years. In one academic year, 2014-2015, the cohort was found to have statistical significance in favor of *low participation*. For graduation, statistical significance was found in participants who were classified as *high participation*. These findings concluded that *high participation* indicate a higher likelihood of graduation within a four-year, five-year, and six-year time frame within the cohort. Furthermore, higher odds ratios were found for all time frames for graduation. With four-year degrees being achieved in a six-year time frame (Myers & Myers, 2017), collegiate recreation participation in the present study was found to have a positive effect on graduation within the cohort of students analyzed.

Chapter Summary

The focus of this study was to identify a relationship between collegiate recreation and RPG rates. In the present study, data were examined from a first-year incoming cohort in the fall of 2011 with 3,516 students. Results from multiple logistic regressions indicate collegiate recreation participation was a predictor of retention, progression, and graduation.

The present study found that participants within the cohort who were classified as *high participation* were more likely to be retained from the first to the second year. Evidence of this finding was presented with statistical significance and higher odds ratios. Furthermore, *high participation* in collegiate recreation was a better predictor of progression in four out of five academic years. Only one academic year, 2014-2015, was found to favor *low participation* in progression of the cohort. Finally, graduation rates of the cohort were examined. Those within

the *high participation* category presented statistical significance in graduation rates for four-years, five-years, and six-years.

In the present study, the research questions were address. The first research question “does participation in collegiate recreation predict retention?” was found to have a positive relationship. Cohort members that participated (*high participation*) in collegiate recreation were 1.69 time more likely to be retained than those were classified as *low participation*.

The second research question, “what is the relationship between participation in collegiate recreation and students’ progression and graduation?” was found to have a positive effect in the cohort. Progression was found to have a positive effect for those who were in the *high participation* category than for those who were in the *low participation category* in most years that were examined. The only contradictory year, 2014-2015, *low participation* was found to have a better prediction in retention than those who were classified as *high participation*.

Lastly, cohort members were more likely to graduate if they were in the *high participation* category instead than in the *low participation category*. Within the time frames examined—four-years, five years, and six-years—cohort members who were classified in the *high participation* were more likely to graduate than those who were in the *low participation* category.

The findings of the present study indicate that collegiate recreation participation has a positive and statistically significant relationship to RPG rates. While there was an academic year that presented contradictory results, 2014-2015, the findings support similar research studies that have been conducted in the field of collegiate recreation.

CHAPTER V

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

The purpose of this study was to investigate if a relationship existed between student participation in collegiate recreation and student RPG rates at a research-intensive university in the Southeast United States. Centered on the theory of involvement (Astin, 1984), this study sought to highlight collegiate recreation as a resource in the endeavors of improving RPG rates in higher education. Using binary logistic regressions, the present study found that collegiate recreation participation did have statistical significance and practical significant effects on RPG rates on the incoming first-year cohort from fall of 2011. Using an ex post facto research design, archival data were gathered from the first year of enrollment of the cohort (2011) through the following six years (2017). An ex post facto design does not establish cause-effect relationships; however, it can provide valuable educational research and contribute considerably to the field of collegiate recreation. This chapter will discuss the research findings, conclusions, implications for the field of collegiate recreation, plan for dissemination, and concluding thoughts.

Analysis of Research Findings

The present study revealed three major findings in relation to collegiate recreation participation and RPG rates. The first finding was in relation to the retention criterion. Regarding retention, the present study found a relationship between collegiate recreation participation and retention. Participants of the study who were classified in the *high participation* in collegiate recreation category were found to have statistical significance in retention. Progression was measured over five academic years individually. Participants of the study who were in the *high participation* category were found to have statistical significance in four out of the five academic

years analyzed. Lastly, graduation rates were found to have statistical significance for those in the *high participation* category for all time frames analyzed: four-years, five years, and six-years.

Discussion of Research Findings

Collegiate recreation is a multifaceted program within a college campus that offers opportunities for students to engage in physical activity that can enhance their performance in their academic endeavors and in their personal lives. With a rich history dating back to the mid-1800s, sports in higher education have served as a key contributor in the development of students and in their learning process. Collegiate recreation departments create opportunities for students to develop personally and it fosters an environment where students can form social networks.

In recent history, higher education administrators have observed a decline in RPG rates among college students. While a college education is still considered an important tool for mobility in the workforce (Brown, 2016), steady declines have been observed among men, full-time students, and fall enrollment across the United States (U.S. Department of Education, 2017). Bridging the gap between the decline in RPG rates and collegiate recreation presents an opportunity for college administrators to solve the problem. Many RPG improvement techniques have been launched by higher education administrators; however, collegiate recreation has not been highlighted as a viable resource in the efforts to improve of RPG rates. The present study linked collegiate recreation and RPG rates with positive effects.

While academic performance is often measured with GPA, the present study measured academic success in the forms of retention, progression, and graduation. Students cannot move along the continuum of higher education without being academically successful and moving

forward in their college trajectory with the goal of graduation. The present study was able to establish a positive relationship with collegiate recreation participation and RPG rates.

Collegiate Recreation Participation and Retention

Retaining students at the institution from freshman to sophomore years and providing opportunities for successful progression is a major priority for college administrators. McElveen and Rossow (2014) found that participants of intramural sports had a higher retention rate among first-time in college students. Similarly, the results of the present study align with these findings, as a statistical significance and practical effect sizes were found in the cohort studied.

Participants of the present study who were categorized as *high participation* in collegiate recreation were found to be retained in higher levels.

Furthermore, in a study by Melnyk et al. (2014), freshmen students who practiced healthy habits, like a balanced diet and physical activity, were more likely to retain from freshman to sophomore years than students who did not. Likewise, the findings of the present study indicated that participants with *high participation* in collegiate recreation were 1.79 times more likely to progress to the second year. The findings of the present study parallel the current literature.

The present study adds to the literature in the field of collegiate recreation by furthering the relationship between collegiate recreation participation and retention. Research has shown the inextricable tie between student involvement, in areas like participation in collegiate recreation and retention at the institution (Astin, 1984). In a study, Forrester (2015) identified that collegiate recreation sports participants placed a significant level of importance in staying at the institution. This finding suggests that students value the benefits that come from participation in collegiate recreation. Valuable findings like Forrester's (2015) and the present study can determine connections to achieve more desirable RPG rates.

Collegiate Recreation Participation and Progression

In addition to institutional retention, students must progress from one academic year to the next academic year to achieve the goal of higher education: graduation. In this study, progression was examined over the course of five years in an incoming first-year cohort. The present study found that progression was predicted in those who participated in collegiate recreation (*high participation*) in most years.

There are many contributors that affect progression in a student's life. According to Astin's (1984) theory of involvement, "the act of dropping out can be viewed as the ultimate form of noninvolvement" (p. 303). Therefore, the findings of the present study suggest that collegiate recreation participation is a viable means for student involvement. Students who are more involved at the institution are also more likely to demonstrate progression from one academic year to the next. By establishing a relationship between collegiate recreation participation and student progression, higher education administrators can employ techniques and partnerships to dismantle the declining RPG rates observed in the last decade at institutions across America.

Low participation during the academic year of 2014-2015 was found to be a better predictor of progression than those with *high participation* in the present study. It is plausible that the reasoning for this contradictory finding lies in the estimation to graduation for the cohort studied. While the researcher cannot be certain for the specific cause of this finding, it can be postulated that students were engaged in other activities in this academic year. The cohort studied entered the university in the fall of 2011, indicating that the academic year of 2014-2015 would be the first academic time frame in which the students could be eligible for graduation.

The approximation to graduation could indicate that students of the cohort were engaged in other activities that impacted their ability to engage with collegiate recreation participation.

Collegiate Recreation Participation and Graduation

On-time graduation has shifted from a four-year time frame to a six-year time frame in recent history (Complete College America, 2014). Brock et al. (2015) and Danbert et al. (2014) found that participants of collegiate recreation were more likely to complete more credits than their peers who did not participate in collegiate recreation, suggesting that students who participate in collegiate recreation are more likely to graduate in four years as a result of more credits being completed. In the present study, participants with *high participation* in collegiate recreation were found to have positive statistically significant and practical effects in graduation. Statistical significance and practical effects were found in the four-year, five-year, and six-year time frames.

Moreover, Davidson (2014) found that a major contributor for a later graduation was centered around students enrolling in less credits. With the high rises in costs seen in higher education within the last 10 years, the longer a student is in college, the more money they will spend. According to Complete College America (2014), the student loan debt has now surpassed the trillion-dollar mark. These financial constraints can often be the barriers to graduation for a student, as often families of college students cannot support the on-going costs of the institution. Furthermore, these debts continue to add to national deficit.

The present study found that participants with *high participation*, indicating that they participated in collegiate recreation, were more likely to graduate. These findings indicate that collegiate recreation participation has a positive relationship in graduation rates for college students. The present study, along with the current literature, support collegiate recreation

participation as a resource in the in the endeavors and pursuit of graduation rate improvement in higher education.

Conclusions

The aim of this study was to present collegiate recreation as a viable resource in the efforts of improving RPG rates. RPG rates have been observed to be declining in recent history in higher education across the country; therefore, higher education administrators must find a solution improve RPG rates. Overall, the present study found statistical significance and practical positive effects on RPG rates on the incoming first-year class of 2011 at a research-intensive university in the Southeast United States. Statistical significance was found throughout the time frame of the study.

In the present study, statistical significance and positive practical effects were correlated with *high participation* in collegiate recreation and retention. Retention is only measured in the first-year of degree-seeking undergraduates from the fall in which they commence to the following fall. In the case of the present study, the retention year was analyzed from the fall of 2011 until the fall of 2012. This finding is a major contributor for the field of collegiate recreation, as most of the institutional leaving takes place prior to the beginning of the second year (Tinto, 1993).

Regarding progression, the present study found that participants classified as *high participation* presented statistical significance and positive practical effect sizes in most academic years of the cohort studied. Progression was set to be measured throughout the following five academic years of the cohort (2012-2017). While only one academic year was found to have statistical significance in favor of *low participation*, this study presents key aspects of progression and collegiate recreation participation.

Lastly, graduation was analyzed in three academic time frames. Four-year, five-year, and six-year graduation rates were analyzed in relation to collegiate recreation participation. Statistical significance, as well as positive practical effect sizes, were found in those who were classified as *high participation* in all time frames. This finding indicates that there is a strong relationship between collegiate recreation participation and graduation in college students.

Implications

Implications that directly impact higher education can be drawn from the present study's findings. The long-term effects of these implications equip college administrators with another resource in the improvements of RPG. While there may never be a *magic formula* for the improvements of RPG rates, collegiate recreation was found to have statistical and positive practical effects on RPG rates and that can change the landscape of college. Direct implications for collegiate recreation practitioners, policy makers in higher education, and the theory of involvement are deducted from the present study.

Implications for Collegiate Recreation Practitioners

Through this study, collegiate recreation practitioners can present the field of collegiate recreation is an influential factor in the in the lives of college students. Through the present study, collegiate recreation participation was found to have a relationship with the improvement of RPG rates on an incoming first-year cohort.

The present study advocates for the validity of the field of collegiate recreation and provides justification for funding, as statistical significance and positive effects sizes were found on RPG rates among those who participated in collegiate recreation. Considering the relationship between collegiate recreation and RPG rates, practitioners should develop meaningful and

practical programming that will foster an environment where students can develop, grow, and create relationships.

Lastly, collegiate recreation practitioners should use the findings of the present study to convene support for funding. Collegiate recreation has been correlated with many positive attributes in both physical and mental health. With mental illnesses on the rise (Beiter et al., 2015), counseling center administrators are in need of partnerships across campus to get students the help they need. Students' well-being is critical for college success and with many mental illnesses being alleviated through physical activity (Gammage et al., 2016; Herring et al., 2015) collegiate recreation should be sought out as a resource to keep students on track to earning a degree.

Policy Implications

The present study found that collegiate recreation had a statistically significant and practical effect sizes on RPG rates, suggesting that collegiate recreation has more to offer than just a place for students to play. These findings should be factored in policy making at the institution. University policies like recreational fees, departmental budget allocation, and healthy lifestyle academic offerings should be considered.

Collegiate recreation departments often depend on the recreational fees paid by students to supplement the incurred costs associated with facilities, staff, and programs. Of importance, higher education policy makers should ensure that the recreational fee is not a burden on the finances of a student. To ensure that the recreational fee does not present financial complications, collegiate recreation departments can supplement cost of living adjustments through offerings for the community when the facilities are most vacant. For example, during the summer semester, there are significantly less students on campus, therefore the recreational facilities are not used as

heavily. The summer can be time to host youth summer camps and activities without incurring more costs, as the amenities are already at the institution.

Furthermore, policy makers should value collegiate recreation departments just as other units are valued on campus when it comes to budget allocations. Often, collegiate recreation departmental budgets are diminished simply because they are perceived as *nonimportant* or as *perk* at the university. The present study affirms the importance of collegiate recreation in a student's life; therefore, recreational facilities should be met with financial support from the university.

In relation to academic offerings, policy makers should implement a healthy lifestyle academic requirement during the first year of enrollment for all students. Melnyk et al. (2014) found that students who participated in a course based on healthy lifestyles yielded higher retention rates from freshman year to sophomore year. Likewise, the present study affirms the notion that physical activity early in college can be a key contributor of progression. Such academic classes can provide formal training on healthy practices for students. Collegiate recreation departments can be considered to be partners in the endeavors for healthy lifestyle academic classes.

Theoretical Implications

As described in Astin's (1984) theory of involvement, the five postulates are: (a) involvement as an investment of physical and psychological energy; (b) involvement occurring along a continuum; (c) involvement as qualitative and quantitative; (d) learning while involved is related to quality and quantity of involvement; and, (e) academic performance being correlated to involvement. The present study focused on student involvement as it pertained to collegiate recreation participation. In Astin's (1984) theory of involvement, student involvement is

theorized as a major factor in persistence at the institution. The results of the present study are aligned with the theory of involvement.

The theory of involvement serves as a link between traditional pedagogical approaches and desired outcomes. The link was reaffirmed in the present study, as students who were involved in collegiate recreation were more likely to be retained at the institution, progressed through academic years, and graduated with a college diploma. Furthermore, the theory of involvement argues that time invested in activities such as collegiate recreation, can have an impact in four areas: academic reputation, intellectual environment, student friendships, and institutional administration (Astin, 1984). The present study aligns with this notion, as RPG rates among students who participated in collegiate recreation were found to have a positive effect.

Recommendations

The present study builds upon Astin's (1984) theory of involvement. While the theory of involvement is not specific to collegiate recreation, it does present student involvement as a major factor in persistence at the institution. Through this theoretical approach, the present study reaffirmed that student involvement in terms of collegiate recreation was a contributor in RPG rates at the institution.

Recommendations for Collegiate Recreation Departments

In addition to the implications listed for collegiate recreation practitioners, collegiate recreation department leaders should seek to create partnership across campus. Partnership with academic units, counseling centers, and other student affairs departments can provide justification for budget allocation and validity to the field of collegiate recreation. Through partnerships, collegiate recreation departments can advocate for students' well-being and serve as a resource for physical activity. As previously exemplified in Chapter II, Virginia Polytechnic

Institute and State University (Virginia Tech) Recreational Sports has created a partnership with the health center and created a program called HEART. This program refers patients from the health center to the recreation department for physical activity for acute mental illnesses.

Partnerships like the one at Virginia Tech should be implemented across the country to help students.

Additionally, it is recommended that Campus Recreation and Intramurals (CRI) promote its facilities, services, and programs in residential halls. Astin (1984) indicated that place of residence was a key contributor for student involvement, as those who live on campus were found to be more involved in the university. For this reason, CRI should heavily invest in marketing tools specific to students who live on campus. With the ease of access, students who live on-campus are susceptible to more involvement. This partnership could yield positive effects on RPG rates at the institution.

Recommendations for Future Study

The field of collegiate recreation is replete with a variety of programs that help students outside of the classroom. Studies in specific areas of collegiate recreation should be conducted frequently to continue to build upon previous studies. For example, studies should be specific to aquatics, fitness, outdoor programs, intramurals, sport clubs, informal recreation, and student employment to further understand the impacts of collegiate recreation in the improvement of RPG rates.

Furthermore, studies in the relationship between collegiate recreation and RPG rates can continue to inform policymakers at the institution. Data-based evidence can present findings that shape colleges and universities. The field of collegiate recreation needs more evidence in its relationship with RPG rates. For example, more studies correlating collegiate recreation and

RPG rates can allow higher education administrators to see the impact collegiate recreation has on students. Through these studies, recreational programs can be utilized for recruitment strategies, student orientations, and academic support among many other endeavors at the university. The relationship between collegiate recreation and RPG rates should continue to be explored for the benefit of future students.

In addition to more studies connecting collegiate recreation participation to RPG rates, the development of a collegiate recreation participation theory should emerge. While the theory of involvement (Astin, 1984) exemplifies holistic student involvement on campus, the breadth and depth of collegiate recreation and student involvement is missing. The creation of a collegiate recreation participation theory can create a direct path between recreational activities and student success. Further, a theory specifically for collegiate recreation can be used in future studies to connect data directly to the field of collegiate recreation. A collegiate recreation participation theory can emerge from more studies and future research.

Impact Statement

The findings from this study can have an impact on several areas. The specific department used in this study, CRI, is directly impacted with the findings of the present study as it conveys information about their users. The university leaders of the institution whose data were analyzed are also directly impacted with this study, as they can be informed of the benefits in collegiate recreation participation and RPG rates.

Campus Recreation and Intramurals (CRI)

The collegiate recreation department that was used in this study has a vested interest in the findings of the present study, as the students who participated in their facility were the focus of this research. Through the present study, CRI can justify its departmental existence, advocate

for more funding, and support student well-being across campus. Furthermore, the present study can be utilized by CRI for future endeavors in facility expansions, innovative programming, and validation for staffing. Through this research, CRI can promote their services, facilities, and programs to students with concrete data. The present study will be shared in writing with CRI during the spring semester of 2019.

University Leaders

The university that provided the data also has a vested interest on the findings of the present study, as these findings can contribute to the improvements of RPG rates on their campus. With declining RPG rates across the country, university leaders should use the present study to construct a firmer relationship with collegiate recreation to improve RPG rates at the institution. While collegiate recreation participation was not affirmed as a *magic formula* in the improvement of RPG rates, collegiate recreation participation was found to have statistical significance, as well as to have positive practical effects sizes, on the cohort examined. The present study should guide university leaders to recognize the direct impact CRI has on students at the university. This direct impact should advise university leaders to support the endeavors of CRI through appropriate budget allocations and as a partner in the quest for improvement of RPG rates. The present study will be shared in writing with the Vice President for Student Affairs during the spring semester of 2019.

Dissemination of the Study

Emanating from the findings and conclusions of the present study, two groups are identified for dissemination purposes. These groups have a vested interest in the findings of the present study, as they are directly impacted by this research. Consideration for dissemination was determined on the micro and macro effects the present study has on the field of collegiate

recreation. The present study will be disseminated to the national association for collegiate recreation (NIRSA) and the national journal that focuses on collegiate recreation publications.

NIRSA: Leaders in Collegiate Recreation

The national association for collegiate recreation, NIRSA: Leaders in Collegiate Recreation, has a vested interest in the present study, as it builds upon other studies and provides more evidence to support the field of collegiate recreation. As a national organization, NIRSA: Leaders in Collegiate Recreation advocates for research to justify the field of collegiate recreation as a champion in student well-being. Through research, collegiate recreation practitioners can share information at events supported by the association. NIRSA: Leaders in Collegiate Recreation partners with hundreds of colleges and universities across the United States and Canada. Research and the vast connection to other collegiate recreation practitioners through association events continues to propel the field of recreation further. The researcher will submit a proposal to share the findings of the present study at the national conference in Phoenix, Arizona in April of 2020.

The Recreation Sports Journal (RSJ)

The Recreation Sports Journal (RSJ) is a scholarly, peer-reviewed publication that seeks to publish journals that add validity and justification to the field of collegiate recreation. The NIRSA Foundation, as a nonprofit organization, established the RSJ to support the field of collegiate recreation. Through the RSJ, collegiate recreation practitioners can find scholarly and peer-reviewed publications that they can utilize at their institutions. Evidence-based findings are crucial to furthering the field of collegiate recreation. Through research, like the present study, the field of collegiate recreation can continue to grow and evolve. The findings of the present study affirm the validity of collegiate recreation; therefore, the researcher anticipates that two or

three articles can be generated to be published in the RSJ. The researcher will submit a manuscript to the RSJ in the fall of 2019.

Concluding Thoughts

As a collegiate recreation practitioner, my passion lies in the discovery of recreation as a tool for students to go through college successfully. This passion stems from my own personal journey as a lost student in my undergraduate years and collegiate recreation being my personal tool for success. Furthermore, collegiate recreation launched my passion for learning and I was able to pursue endeavors I never imagined I could be capable of like a terminal degree. I am forever grateful to the field of collegiate recreation for aligning my passion with my career.

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APPENDIX A



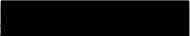
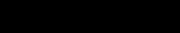

Table 6. Cohort GPA

	GPA
	<i>M (SD)</i>
First Year	2.87 (.765)
Second Year	2.94 (.632)
Third Year	2.95 (.600)
Fourth Year	2.76 (.535)
Fifth Year	2.40 (.470)

Table 7. Cohort Gender

	Frequency	Percent
Male	1,834	52.2
Female	1,682	47.8
Total	3,516	100.0

APPENDIX B

 Office of Research Services & Sponsored Programs Institutional Review Board (IRB)	
Phone:	
Fax:	
IRB@  .edu	
	

To: Marquez, Gabriela; Melton, Teri

From: Office of Research Services and Sponsored Programs
Administrative Support Office for Research Oversight Committees (IACUC/IBC/IRB)

Approval Date: 7/12/2018

Subject: Status of Application for Approval to Utilize Human Subjects in Research

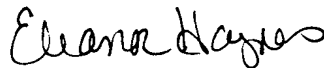
After a review of your proposed research project numbered **H19001**, titled "**Collegiate Recreation and Student Retention, Progression, and Graduation**," it appears that your research involves activities that do not require full approval by the Institutional Review Board (IRB) according to federal guidelines. In this research project research data will be collected anonymously.

According to the Code of Federal Regulations Title 45 Part 46, your research protocol is determined to be exempt from full review under the following exemption category(s):

- B4 Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

Any alteration in the terms or conditions of your involvement may alter this approval. *Therefore, as authorized in the Federal Policy for the Protection of Human Subjects, I am pleased to notify you that your research, as submitted, is exempt from IRB approval. You will be asked to notify the IRB upon project completion. If you alter the project, it is your responsibility to notify the IRB and acquire a new determination of exemption.*

Sincerely,



Eleanor Haynes
Research Integrity Officer