

STUDENT ACCESS TO ACADEMIC SUPPORT SERVICES AS A MEDIATING  
VARIABLE FOR INCREASED ACADEMIC PERFORMANCE AND GRADUATION  
RATES AMONG TRADITIONAL UNDERGRADUATE STUDENTS: A SURVIVAL  
ANALYSIS

by

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A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree of  
Doctor of Philosophy in Health and Human Performance

Middle Tennessee State University  
August 2015

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This dissertation is dedicated to my family. To my Mom and Dad who have always been there for me during a time of need, or even when things were going well. You have always impressed upon me the virtues of hard work, honesty, integrity, love, and forgiveness. I will remember these things always and promise to do for my child and grandchildren as you have done for me. To my brothers, Keith and Kevin, we may miss each other for months or maybe years on end, but we are always able to find each other. Your “tough love” mentoring as I was growing up, shaped my tenacious nature and taught me how to fight for what was right. To my beautiful and talented son, Logan, you make me more and more proud with each passing day. My sincere hope is that this accomplishment will teach you that anything can be accomplished through hard work and perseverance. I look forward to watching you hurdle your own obstacles, run through your own barriers, and take the world by storm. I am forever blessed to have you in my life. I LOVE YOU BUD.

## ACKNOWLEDGEMENTS

I would like to thank my dissertation committee for their wisdom, mentorship, instruction, friendship, and encouragement. To Colby Jubenville, my Chair, I owe my eternal gratitude for his role in encouraging me to start the Sports Management Doctoral Program and supporting my admission, as well as being the ultimate cheerleader and motivator for my completion. To Steve Estes, for his mentorship, for guiding me through the maze of academic administration, and for teaching me to think outside of the box. To Terry Goodin (the Guru of PBL), for teaching me how to be a truly effective teacher, and how the world of higher education is in a constant state of transition. Finally, to Norman Weatherby, most likely my favorite professor during my doctoral coursework. Anyone who can make statistics and data analysis fun and interesting must have some serious talent! I would also like to credit him with the inspiration behind the design and data analyses performed in this study.

Also, I would like to thank Dr. Terry and Dr. Sharon Whiteside for their longtime friendship and support for entering my doctoral studies. To Dr. Mike Boyle for providing the impetus for me to start this journey and impressing upon me the need to get my “Union Card”. To Dr. Lana Seivers, for her wonderful leadership and for always supporting me and my family. And finally to Middle Tennessee State University: through all of my travels, it is definitely the best campus on earth. I will forever be True Blue!

## ABSTRACT

Although the trend in higher education is moving towards an emphasis on institutional mission-based funding and retention plans, little research has been done to evaluate the effectiveness of integrated academic support programs for increasing student academic performance and graduation rates. The purpose of this study was to investigate if academic support based retention measures have an effect on student graduation and to examine if current academic support models positively influence academic performance in those populations that have access to them. A total of 27,176 students ( $N = 25,729$  general population, 741 student athletes, 722 Greek students) from five cohort years (2001-06) were identified for analysis. Chi-square and rate ratio analyses were conducted to determine if graduation rates differed between the three groups and their likelihood of graduation. Survival analyses and Cox regression analyses were performed on each group to determine their efficiency of graduation events compared to the other groups.

Results of the Chi-Square and Rate Ratio analyses indicated that students with access to three academic support services (Greeks) and five academic support services (student athletes) were more likely to have a graduation event than students with access to one academic support service (general student population). Results of the Cox Regression analyses indicated that when controlling for all other variables, students with access to five academic support services are more likely to have a decrease in graduation events than students with access to one and three academic support services as the number of attempted credit hours increase. In addition, students with access to one academic support

service are more likely to have an increase in graduation events than students with access to three and five academic support services as the number of attempted hours increase.

As this trend in graduation rates were found to be consistent across all Tennessee Board of Regent (TBR) institutions, the primary recommendation is for all academic support services found among the two subpopulations be made available to the entire student population. Future research recommendations include examination of academic support service utilization survival analysis.

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## CHAPTER I.

### INTRODUCTION

#### **Problem Statement**

In recent years the emphasis and importance of earning a college degree has grown significantly. As the United States has moved into the technological age of the 21<sup>st</sup> Century, a college education has become imperative to an individual's long term economic success (Adams, 2011). Concomitantly, public funding for institutions of higher education has also evolved from traditional enrollment based funding to an outcome based model (Deaton, 2012). Although the trend in higher education is moving towards an emphasis on institutional mission-based funding and retention plans, little has been done to examine the benefits of a plan to provide comprehensive and integrated academic support for its students in order to retain them. This study will examine the relationships and efficacy of college-based academic support services.

According to the report provided by the Southern Regional Education Board (SREB) (Bradley & Blanco, 2010):

Clearly, the nation's success in attracting more students to college has not been matched by success in graduating them. In fact, research shows that students from disadvantaged backgrounds or with low SAT/ACT scores are even less likely to complete bachelor's degrees than their classmates (p. 1).

Moreover, SREB recommends inclusive, campus-wide institutional initiatives as additional strategies that campus leaders can utilize that will increase student retention and completion (Bradley & Blanco, 2010). As the primary funding for public and private

institutions resides in the tuition and fees generated by student enrollment, colleges and universities will continue to recruit and admit students to ensure their economic solvency. In addition, the added emphasis for a post-secondary education increases the demand for students to enroll in colleges and universities. As the stakes become higher for students and institutions to persist in higher education, retention measures founded on academic support models will be imperative for both parties' long term success.

### **Legislative Measures to Improve Graduation Rates**

As additional public funding for colleges and universities moves toward an outcomes based formula, government officials and legislators have re-stated their expectations of colleges and universities to follow their institutional mission: to educate and graduate their students above all else. As the report by Bradley and Blanco (2010) suggests: "most institutions of public higher education exist to educate students. Students, their families, and policy-makers expect that the state's public colleges and universities will do everything possible to help students complete their degree, and college completion should be the institution's *top priority*" (p. 2).

There are several problems that may arise if a student does not persist and eventually graduate from a college or university. When a student is not retained or does not graduate, not only does the institution lose fiscally, but the student defaults on tuition money and time spent pursuing a degree, and too often student loan debt can inhibit their financial solvency for years after the student leaves the university (Adams, 2011). In short, there are financial issues for both the university and the student if they fail to persist and obtain their degree.

In 2009, the State of Tennessee began examining an alternative funding formula to the long standing enrollment based formula. This examination began due to poor national graduation rates as depicted in a state-profile-report generated by the Chronicle of Higher Education (2012). This report indicated that in 2010 the state of Tennessee ranked 40th out of 50 states in the nation, with only 32 percent of Tennesseans having a college degree. Moreover, Middle Tennessee State University, the state's largest undergraduate institution, reported that only 46 percent of their cohort graduated in six years by 2010-11.

As a result of this negative publicity, policy-makers in the state of Tennessee collaborated with college and university officials to put stronger legislation and funding initiatives in place to hold Tennessee public institutions of higher education more accountable to following their mission of educating and graduating their students (Deaton, 2012). In 2009, the Tennessee Higher Education Commission (THEC) presented the Governor a new incentive structure based on an outcomes based model that would replace the enrollment based model. The Governor approved the proposal and after consulting with the state legislature, passed the *Complete College of Tennessee Act* in 2010. This legislation was developed:

After consultation with the Board of Regents and the University of Tennessee Board of Trustees, policies and formulae or guidelines for fair and equitable distribution and use of public funds that are consistent with and further the goals of the statewide master plan. The policies and formulae or guidelines shall result in an outcomes-based model (Deaton, 2012, p. 8).

Under this new funding policy, the state of Tennessee completely replaced the previous enrollment based funding model which provided incentives for enrollment growth

rather than for degree completion. It was also implemented in a unique fashion for all state public institutions and tailored to their individual missions. After a three year phase-in period, all Tennessee state institutions of higher education were to receive state funds on their outcome formula beginning in 2014 (Deaton, 2012). However, as of this writing, the formula has yet to be funded, although the Governor maintained that 25 million dollars will be appropriated to fund the program for the 2015-16 academic year (Associated Press, 2015).

The approach by the policy-makers in the state of Tennessee is consistent with much of the research in higher education which calls for the assessment of institutional effectiveness as a necessary and important component to higher education (Kempner & Taylor 1998). As a result of the new legislation, the college and university presidents began to implement strategic plans in order to focus on retaining and graduating their students. According to the academic master plan at Middle Tennessee State University, the number one goal is to enhance academic quality, and the primary objectives to attain that goal were to increase retention and graduation rates, develop targeted programs for non-traditional students, open night student services offices, establish a comprehensive tutoring center, and develop more on-line services (Middle Tennessee State University, 2007).

This approach is also consistent with the recommendations made by the SREB (Bradley & Blanco, 2010) which indicate that effective academic departments and administrative units provide leadership for student success and a collaboration of efforts between these constituents lead to higher retention and student academic success. Moreover, it is imperative that institutions explore the literature and research studies that

examine traditional and recent retention models in order to implement streamlined student retention programs and allocate resources effectively.

### **Academic Reform Measures for Student Athletes and Greek Life**

Although the legislative measures taken by the state of Tennessee appear to be an innovative, or even radical, solution to increasing student retention and graduation, this approach is not new to institutions of higher education. As a result of years of negative publicity related to poor student athlete academic performance as reported in the mandatory publishing of student athlete graduation rates in the 1990's (Ferris, 2004), the NCAA approved the implementation of the Academic Performance Rate (APR) in 2004. The NCAA began collection of student athlete retention and graduation data retroactively beginning with the 2003-04 academic year (National Collegiate Athletic Association (NCAA), 2005). These data continue to be collected as of the present 2014-15 academic year, where student retention and graduation frequencies are calculated through a complex formula to establish a benchmark for student athlete academic success by a 50 percent graduation rate (Satterfield, Croft, Godfrey, & Flint, 2010). In addition, athletic teams and member institutions who do not meet this benchmark are held to a punitive disincentive structure which may include: loss of practice time, loss of scholarship, loss of post-season competition eligibility, and eventual loss of association membership if the established benchmarks are not met initially and grow more punitive for repeated failure (NCAA, 2014).

As the literature suggests, the rationale, benchmarks, and disincentive structure of the Complete College of Tennessee Act implemented by the state of Tennessee in 2010, have many similarities to the APR legislation implemented by the NCAA in 2004.

Moreover, the research found in the review of literature in this study strongly indicate that the academic support measures taken by NCAA member institutions and their athletic departments, have had a profound impact on increasing student athlete academic performance, persistence, and graduation as indicated by a significant and steady increase in Federal Graduation Rates and APR scores nationally (NCAA, 2011). Therefore, the premise of this study is that as the accountability structure of the Complete College of Tennessee Act so closely mirrors the NCAA APR accountability structure, that the strategy for improving student academic performance, persistence, and graduation to meet the state of Tennessee academic benchmarks, should also mirror the strategies employed by the institution and athletic department to continuously meet the NCAA APR benchmarks established ten years prior.

The literature also indicates that campus groups such as Greek life have also increased academic support services for their members as a means to improve recruiting new members and standing at the institution (Soria, 2012). As a result of increased academic and social integration, Greek societies also report higher persistence and graduation rates than their non-affiliated peers nationally. Although Greek affiliated student academic support appears to have fewer components and has not been as publicized, research indicates that there is a significant relationship between access to academic support services and improved academic performance that is similar to the progress made by student athletes since the NCAA academic reform in 2004.

## Statement of Purpose

Based on the increased emphasis on academic performance as measured by retention and graduation rates, and the implementation of student support services as the primary strategy employed by athletic departments and Greek life to meet these benchmarks, the purpose of this study is to investigate if academic support based retention measures have an effect on student graduation and to examine if current academic support models positively influence academic performance in those populations that have access to them.

## Research Questions

1. What effect does the amount of access to academic support services have on the likelihood of student graduation?
2. What effect does the amount of access to academic support services have on the efficiency of student graduation as determined by credit hours attempted for degree completion.

## Research Hypotheses

**H<sub>1</sub>:** Students with access to more academic support services are more likely to have a graduation event than students with access to fewer academic support services.

**H<sub>2</sub>:** When controlling for ACT scores, High School GPA, race, and gender, students with access to more academic support services are more likely to have a graduation event with fewer attempted credit hours than students with access to fewer academic support services.



## **Assumptions**

1. Subjects selected for analysis are included once
2. Subjects selected for analysis will remain constant over the study period
3. Subjects who are censored (do not have a graduation event within the time constraints of the study) have the same survival prospects as the non-censored participants
4. All subjects have equal access to non-academic support services including: major choice, access to professors, remediation, library facilities, student affairs programs and facilities, and financial aid packages (e.g., Pell Grants)

## **Definition of Terms**

1. Engagement- The literature identifies both social engagement and academic engagement in retention studies. Social engagement describes student integration and patterns of interaction between the student and other members of the institution especially during the first year of matriculation (Tinto, 2007). Academic engagement is defined as student participation and integration into mentoring and formal and informal academic integration programs (e.g., tutoring) (Pope, 2002).
2. Cohort – Is defined as the initial matriculation period in which a group of students enter their home institution for full time study towards an undergraduate degree (Williams, 2013).
3. Graduation Event –Is defined as the moment a student is officially awarded their undergraduate degree by the institution per the MTSU graduation requirements (see term 4). It is also used as a unit of measurement for the data analyses performed in

this study to determine the moment in time where student graduation occurs during a given time interval

4. Graduation –For the purpose of this study, undergraduate graduation is defined by The General Requirements for Baccalaureate Degrees as outlined in the Middle Tennessee State University undergraduate catalog. The requirements contain, but are not limited to:

- Students must complete 120 credit hours with a 2.00 grade point average
- A minimum of 25 percent of credit for each degree awarded by MTSU must be earned through the offering by the University
- At least 42 semester hours of junior and senior courses must be completed with an average grade of C or better.
- A minimum of 60 hours of senior college credit will be required of all students who transfer from colleges of less than four year designation.
- A minimum 2.00 GPA will be required in a major pursued as a graduation requirement
- All candidates must meet the General Education requirements as outlined

The aforementioned are the basic requirements for graduation at MTSU, but may not include specialty programs (Middle Tennessee State University, 2013b).

5. Academic Support –Defined as various academic services provided by an institution to increase academic performance (Gansmer-Topf and Schuh, 2006). For the purpose of this study, academic support will be operationally defined as

intrusive advising, academic mentoring, guided study hall, tutoring, and required participation in services.

6. Prescriptive Academic Advising –The literature defines prescriptive advising as the format where the advisor outlines tasks for the student to complete (Yarborough, 2010), and where sessions are based around the expertise of the advisor (Conklin, 2009)
7. Intrusive Academic Advising – Intrusive advising is defined by three principles: academic and social integration, assisting students in becoming academically and socially integrated, and positively influencing student motivation (Conklin, 2009).
8. Academic Mentoring -- Academic mentoring is defined as an individual who is more experienced and successful academically, providing wise counsel, strategies, and advice to a student who possesses little experience or has a history of academic difficulty (Campbell & Campbell, 2007).
9. Guided Study Hall –Is defined as a dedicated and specific location where students have the opportunity their class work in a structured and supportive environment where students also have access to specific support services such as: supplemental instruction, tutoring, peer mentoring, and time-management (Dicken, Foreman, Jensen, & Sherwood, 2008).
10. Tutorial Services – Tutoring is defined as a supplemental learning experience in which one person (tutor) supports and promotes the learning of another individual (the tutee) or group of individuals (Kersaint, Dogbey, Barber & Kephart, 2011).

11. Required Participation in Academic Support Services –Is defined as immediate consequences for students that do not utilize campus academic support services as illustrated by the student athlete academic support model (NCAA, 2009).
12. Student-Athlete –For the purpose of this study, student athletes are defined as active members of an intercollegiate athletic team at MTSU as coded by the institution’s Registrar.
13. Fraternity Member –For the purpose of this study, Fraternity members are defined as formally inducted members in an active chapter of a fraternal order as coded by the institution’s Registrar.
14. Sorority Member – For the purpose of this study, Sorority members are defined as formally inducted members in an active chapter of a sorority as coded by the institution’s Registrar.
15. General Student Body –For the purpose of this study, students in the general student body are defined as students that are not members of a particular group or organization relative to the other subpopulations being analyzed in this study.

### **Limitations**

This study is limited by the examination and data collection from one institution out of a possible 120 in this subdivision of intercollegiate athletics, and therefore, the results may not be representative of all institutions participating in this subdivision of intercollegiate athletics. Moreover, access to academic support services, not utilization, was investigated which may have an effect on the variability of any significant findings. Further, a truncated age category (18-24), was used in the analysis for all students, which may not reflect a complete representation of all college students (e.g. non-traditional adult

learners & graduate students) and how they perform academically with regards to access to academic support services.

Lastly, this study is only examining student graduation outcomes from an academic support and performance perspective. There may be several other contributing factors such as: financial constraints, family issues, psychological issues, and personal issues (i.e., “Life Events”) that contribute to a student’s academic success or failure that will not be investigated.

### **Delimitations**

The investigator attempted to control for homogeneity in the sample and lack of generalizability, by sampling from several different cohorts across time. It was assumed that by creating a larger sample size across time-points, it would provide more variability between subjects. Moreover, by multiple cohort sampling, the investigator attempted to derive a sample that was most representative of other peer institutions (i.e., public, state, FBS) which may increase generalizability. Furthermore, the investigator used a truncated age category as most Greek and student athletes typically participate as traditional freshmen or transfer students (Tinto, 1993). Therefore, the age category was set as the most representative population of the subgroup population and a peer group of traditional college students.

Although these groups may not be representative of all college students; by truncating the age category, the investigator was able to create three demographically similar comparison groups. Finally, although there may be other significant contributing factors to student graduation outcomes, the investigator has determined that access to academic support is the primary differentiating *academic* factor between the groups being

investigated, and therefore, is the most salient method for examining how academic interventions affect student persistence, success, and graduation.

## CHAPTER II.

### REVIEW OF LITERATURE

#### **Institutional and Social Integration Retention Model**

As much of the research in student persistence and retention indicates, engagement of the student to the university and the institution's ability to provide engagement opportunities correlate strongly with the student's success and persistence. Vincent Tinto is most often cited and associated with student persistence and retention research (Yarborough, 2010). Tinto's (1975) model of attrition and persistence includes the following components: (a) pre-entry attributes (prior education and socio-economic background), (b) goals and commitments (student and institutional goals), (c) institutional experiences (academics, faculty, peer-group interaction), (d) integration (academic and social), intentions and external commitments, and (f) outcome (departure-graduated, transferred, dropped-out). Central to this model are the concepts of integration and the patterns of interaction between the student and other members of the institution especially during the critical first year of college and the stages of transition that marked that year (Tinto, 2007).

A key concept addressed by Tinto (1993) is that students who are academically and socially integrated into the college culture are more likely to be retained. Moreover, research has indicated that traditional college age students who are academically and socially engaged with the college are less likely to leave college prematurely. For the purpose of this study, academic engagement is operationally defined as academic support from faculty, advisors, tutorial centers, and institutional academic interventions. However,

certain subpopulations such as fraternity and sorority (Greek) affiliates may also benefit from social engagement as well as academic support.

Elkins, Braxton, and James (2003), used Tinto's (1993) model of student retention and found that academically and socially engaged students are more likely remain in college as well. Further, from a non-academic perspective Tinto (1993) found that traditional students, as defined by attending college for the first time, and entering college directly from high school, social integration is primarily influenced by what occurs on the college campus including: clubs, intramural and intercollegiate athletics, student government, sororities and fraternities, concerts, lectures, and other activities.

### **Academic Integration Retention Model**

While these non-academic engagement opportunities may have a positive effect on student persistence and retention, academic engagement factors are identified as stronger correlates and predictors of success and persistence among college students. Pope (2002) in examining minority students, reported that students who participated in mentoring and informal academic integration programs enhanced their academic and social integration. Furthermore, Pascarella and Terenzini (1991) concluded that it was of primary importance that students engage in academic integration and that campus environmental influence contributed highly to a student's decision to remain or depart from college. Troiano, Liefeld, and Trachtenberg (2010) found that "students who consistently attended academic center support appointments had higher rates of success than those who did not attend or who did not attend consistently. Additionally, these students tended to have higher grade point averages and persist in graduation" (p. 40). DeBard (1987) proposed that institutions must provide academic support programs that directly meet the academic needs of their



students and the worst mistake that could be made is to *fractionalize* these services, which is dividing these services among different units, with little or no coordination between delivery of services. Moreover, Penn-Edwards and Donnison (2011) reported that:

Students do not operate on a semester or yearly cycle but on a smaller cycle, by study unit needs (preparation, activities, and assessment) and access to academic resources and services as they need them. This engagement is highly individualized and occurs at different levels and in different times. They will also revisit resources and services at different levels as they need them. Arguably, therefore, the most effective ways to encourage adoption of academic support is to firstly, provide more flexible timing and secondly, prompt student use of them at appropriate times in an individualized and prioritized manner (p. 576).

While it is evident from the review of the retention and persistence literature that engagement and support of students by the institution is critical to their academic success and persistence, research has been slow to recognize or identify a specific paradigm or model as to how this support should be implemented. Moreover, as funding and appropriations are often at a premium, appropriations for centralized academic support and engagement often get lost. Tinto (2007) states:

While many institutions tout the importance of increasing student retention, not enough have taken student retention seriously. Too few are willing to commit needed resources and address the deeper structural issues that ultimately shape student persistence. They are willing to append retention efforts to their ongoing activities in ways that address the deeper roots of student attrition. There are numerous reasons why this is the case. Perhaps the most important is that

increasing student retention is not high on everyone's list of priorities, in particular the faculty (p. 9).

As previously noted, impact of retention and graduation on the stakeholders in modern higher education is high which lends itself to committing adequate resources to stimulate student persistence. According to Alexander (2000) this is not just the institution's responsibility, but all of the stakeholders as little research has been done to examine how an organizational financial strategy such as resource allocation may provide insight into improving undergraduate retention and graduation rates. This is the question that institutional stakeholders (i.e., students, parents, legislators) are pressing institutions to answer. However, how can 4-year institutions allocate limited resources effectively and efficiently and still maintain or increase productivity as measured in terms of retention and graduation rates? This question provides a direction for academic engagement and support in modern higher education. Boylan (2009) recommends gathering data on students' academic, nonacademic and personal attributes and then tailoring institutional services to best serve them. This data-driven approach would allow the institution to pin-point their support needs to suit their unique mission and student population and utilize its resources effectively and efficiently.

### **Time Required for Degree Completion and Dropout**

As both the social integration and academic integration models focus on supporting students through their academic careers, the premise behind each is to prevent students from dropping out (i.e., not being retained) and not completing requirements for graduation. An important by-product to successfully supporting a student, particularly academically, is decreasing the time required to complete their degree. As such, Ramist

(1981) reported that the average national graduation rate after four years was between forty-five and sixty percent, while graduation rates for students that persisted beyond six years dropped to ten to fifteen percent. Moreover, results of a study by Bound, Lovenheim, and Turner (2012) indicated that the timeliness of degree completion at public universities has risen from 4.48 to 4.81 years, with a dramatic drop-off in retention and graduation past five years. In addition, the results of a study by the Institute for Higher Education Leadership and Policy (2009) indicated that the timely accumulation of college credits is directly related to increased motivation to persist and succeed. Furthermore, these results indicated that “the rate of earning a bachelor’s degree was 40 percentage points higher for students who completed at least 80% of the credit they enrolled in during the first year compared to those who completed a smaller percentage of first-year credits by withdrawing from or failing courses” (p. 17). The primary impact of timeliness and degree completion is directly related to the financial ramifications students experience when they drop, fail, and/or repeat classes. According to Shulock and Koester (2012) “estimates and costs vary, because of different tuition and aid policies, but additional time in college hits students’ pocketbooks in two ways: the direct added costs of tuition, books, and additional expenses, and the indirect opportunity costs of delaying entry into the job market with wages that reflect the college degree (p. 3). As such, paying the extra cost of additional hours attempted past the required number as well as additional residence hall and meal plan payments, not only make it more difficult for middle and upper class students to continue to persist, but makes it especially difficult for students that come from low-income families and for first generation college students (Ramist, 1981).

According to Panatages and Creedon (1978) financial difficulties make up a large percentage of why students drop-out of college and the risk increases dramatically if students fail to graduate in a timely fashion within the four year track of their program. This is of particular import for students that are legal residents of Tennessee. For Tennessee residents, students may be eligible for the Tennessee Lottery Hope Scholarship which will pay a student's tuition for their entire undergraduate degree. The caveat to this scholarship, however, is that they must maintain continuous full-time enrollment each semester, maintain a cumulative GPA of 2.75 up to 48 hours, a 3.0 for 49 hours and beyond, and graduate within five years. Moreover, the scholarship will only pay for 120 attempted credit hours even if students meet all of the above criteria (Middle Tennessee State University, 2015). Therefore, if students in the general population in particular are not graduating efficiently, they may not persist beyond this limit due to the increased financial burden.

In addition to financial factors, poor academic progress is also a significant factor for drop-out in undergraduate students (Institute for Higher Education and Leadership and Policy, 2009). Poor academic progress is a frequently cited category that includes: poor grades, disinterest in courses and program of study, inability to succeed in courses leading to the student's desired career goals, and an eventual loss of confidence that the student is any closer to completing their degree (i.e., they are not making timely progress) (Fetters, 1977). Other significant factors related to student drop-out are: personal considerations such as emotional problems, adjustment to college life, family responsibilities, and illness. These are more commonly referred to as "Life Events" (Panatages & Creedon, 1978).

Lastly, dissatisfaction with the institution and full-time work obligations contribute in small part to student drop-out in higher education.

As the literature indicates, timeliness in degree completion is a significant factor for preventing drop-out, increasing motivation, and improving financial solvency. The longer students take to complete their degree, the more hours they attempt due to failed and dropped courses or take unnecessary courses due to poor advisement, the less likely it is that they will graduate at all. Therefore, the primary mission of an institution and the main goal of any retention plan should be to provide a comprehensive and integrated academic and social support system, so students may stay on pace for timely degree completion and to get help immediately should one of the “symptoms” of drop-out contribute to their eventual attrition from the institution.

### **Academic Support**

As the literature on student retention and persistence suggest, engagement in the college or university has proven to be a strong predictor of academic success and graduation. Therefore, engagement opportunities offered by the institution is paramount to achieving strong retention and graduation rates. However, the mode in which these engagement services are delivered may be a critical factor. Although campus-wide integration initiatives such as clubs, organizations, lectures and other activities as suggested by Tinto (1993) may assist the first year student transition into college life, this may only make up a small portion of the equation in assuring academic performance.

Bloom (1976) indicated that at most, 25% of students’ academic success is determined by nonacademic characteristics. Some examples of these factors include: the student’s level of self-confidence, degree to which students associate and feel connected

with other students and university personal and the institution as a whole, and the degree to which the student is willing to seek help. Moreover, Ryan (2004) examined the relationship between institutional expenditures and graduation rates and found that expenditures related to instruction and academic support contributed to increased graduation rates while expenditures related to student services and institutional support did not. As such, a study by Gansemer-Topf and Schuh (2006) concluded that:

How institutions allocate their resources influences student retention and graduation. Although institutions may be limited in the amount of money they have, the results suggest that those with tight budgets may still improve their retention and graduation rates by consciously allocating flexible resources to specific expenditure categories (i.e., instruction, academic support) that appear to influence retention and graduation rates positively (pp. 635-636).

As academic support and instruction measures are pervasively linked to increased student academic performance in retention and persistence literature, this study examines the relationships and predictive measures between academic support services and increased academic performance among college students in a large public university in Tennessee. Academic support services is operationally defined as: intrusive academic advising, academic mentoring, guided study hall, tutoring, and required participation in services.

### **Academic Advising**

Academic advising can assist students in exploring goals, choosing courses and motivating them to be successful (Conklin, 2009). Moreover, academic advisors can provide a conduit between faculty and student, parent and student, student and ancillary institutional services, and provide a haven for students to go to when they are having

difficulty finding their way on campus. This, in and of itself, can be a powerful contributor to student academic performance and success.

Academic advising has been identified by Tinto (2004) and Bean and Metzner (1985) as a variable which can influence college student academic success. Habley (1981), found that academic advising played a critical role in student retention. Further, academic advising has been found to have a positive impact among 2 and 4 year college students and on student retention and persistence (Braxton & Mundy, 2002). Fowler and Boylan (2010) found that mandated prescriptive and developmental academic advising visits through prescribed college reading courses encouraged students to examine their “own life situation and compelled students to examine their goals and choice of major” (p. 9). Students were also encouraged to think and read critically as they completed their first semester developmental and general education coursework. The results yielded increased persistence in the experimental group as opposed to the control group which received no such intervention. According to the report published by (ACT 4<sup>th</sup> National Survey, 2010), the highest reported mean for student response to 42 potential campus retention practices was academic advising. Moreover, respondents from 4 year colleges and universities rated academic advising as one of the most utilized programs among 42 potential retention services provided.

The purported success of academic advising in retention practices may reside in the ability of the academic advisor to have direct access to the student. Habley (2004), contends that “academic advising is the only structured activity on the college campus in which all students have the opportunity for one-on-one interaction with a concerned representative of the institution” (p.1). To expound on this statement, modern academic

advising has moved from a passive feature of the campus community to a proactive, *advising is teaching* paradigm. The National Academic Advising Association (NACADA) (2006) strongly embraces this notion through a combination of components as best practices. These components include a) curriculum (subject matter advising covers), (b) pedagogy (the teaching and learning strategy methods used to convey the subject matter, and (c) student learning outcomes (the student learning expected from academic advising (Gordon, Habley & Grites, 2008).

The underlying theory behind this approach is that if each institution of higher education is able to create specific and unique learning outcomes for academic advising and provide detail of the knowledge each student should possess, then specific interventions can be implemented and its success or failure can be assessed (Erlach & Russ-Eft, 2011). As this paradigm continues to evolve, academic advisors will be able to be more intrusive in the academic pursuit of their students and develop specific intervention plans to prevent academic failure and attrition. The expanded role of academic advisors may prove critical to enhancing student academic performance and contribute to increased graduation rates.

### **Prescriptive Academic Advising**

The role of the academic advisor at institutions of higher learning has evolved exponentially since the position's inception in the 1900's. As such, the paradigm used in the field of academic advising continues to be pushed. Prior to the 1970's prescriptive advising was the accepted paradigm and presumes that students will take the initiative to contact their advisor when in need of assistance (Conklin, 2009). Moreover, prescriptive styles are based on the expertise of the advisor. Advisors outline tasks for the student to



complete, and the impetus is on the student to complete the tasks (Yarborough, 2010).

This approach is consistent with informative advising where there is a one-way and passive paradigm in which advisors simply deliver the information and it is the student's responsibility to act upon it (Shane, 1981).

This method of academic advising delivery is certainly cost effective in that institutions would have to employ fewer academic advisors as they act only as an information center and all accountability for academic success or failure resides with the student. However, as the stakes for retention and graduation figure more predominately into funding formulas, it would seem prudent to employ a more proactive, intervention-based approach in academic advising centers. Although the cost to deliver these services would be higher, as more academic advisors are needed to provide an intrusive service, success rates in the end would provide a positive return on the investment.

### **Intrusive Academic Advising**

As opposed to prescriptive academic advising which is passive and outcomes reside with the student, intrusive academic advising is a dichotomous approach where academic advisor and student work together to share information, develop intervention strategies, assesses outcomes, and share accountability. Intrusive advising is based on three principles: there is academic and social integration, students can be assisted in becoming academically and socially integrated, and that intrusive academic advising can positively influence student motivation (Conklin, 2009).

Glennen (1975) promoted the concept of intrusive academic advising to assist students in everyday issues and to deal with academic problems. As such, intrusive academic advising helps to establish a relationship between the academic advisor and the

student which can result in improved retention and academic performance (Glennen, 1975). As a result of implementing this model at a 4 year institution, Glennen (1975) found 74% of students deemed to be at-risk academically, passed their courses by the end of the semester.

In addition to improving academic performance, he reported that “the freshman attrition rate had decreased by 39% during the first 2 years of implementation of intrusive advising” (Glennen, 1975, p.4). Additionally, Glennen and Baxley (1985) reported that intrusive academic advising among freshmen students led to students completing more credit hours, earning a higher grade point average, and being retained. Noel-Levitz (2001) reported on the success of retaining at-risk students through the implementation of an intrusive academic advising program. As a result, there was a significant increase in freshmen-to-sophomore retention and graduation rate. Jones (2013) found that the use of intrusive academic advising was directly related to an increase in semester GPA’s for at-risk freshmen students and that this group performed significantly better than a control group that received traditional prescriptive advising. Moreover, students may feel an increased in confidence and motivation as result of more intrusive and interactive academic advising services. Bernhardt (1997) found that the use of intrusive academic advising was directly related to student retention, graduation, and successful transitions in TRIO academic support services programs for first generation and/or low-income college students. Miller (2010) found the academic self-efficacy was significantly higher in a group of freshmen students who received intrusive academic advising as compared to a control group who received traditional academic advising. Vander Schee (2007) found

that the frequency of intrusive academic advising meetings had a direct effect on student academic self-efficacy, positive motivation, and academic achievement.

The results of these studies indicate that the ability of an academic advisor to be intrusive, or actively concerned about the affairs of the student in a symbiotic fashion, allows them to utilize an experimental approach to academic performance enhancement and yield positive outcomes. As suggested by Earl (1988), intrusive academic advising structured intervention protocols are used to motivate and to seek help at the first sign of academic difficulty. Moreover, early warning systems can be put into place to prevent academic difficulty before it arises. Fowler and Boylan (2010), further suggest that intrusive advising also “addresses nonacademic and personal factors related to student success” (p. 8). Some of these factors may include: clear guidelines, transition coursework, counseling, and career goal-setting and planning. Lastly, Kramer (2000) indicated that intrusive academic advising is multi-dimensional and can be used for student who achieve at a variety of educational levels as well as for student that come from a multitude of ethnic and socio-economic backgrounds.

Intrusive advising provides the academic advisor with quick feedback and allows them to assist the student in a real-time fashion. Based on the review of the literature, it is apparent that academic advising, intrusive academic advising in particular, is a major contributor to academic performance enhancement in college and universities. However, it is also apparent that student academic performance increases significantly when paired with other campus resources offering academic support to assist in the intervention process.

## **Academic Mentoring**

According to numerous studies, academic faculty and peer mentoring is a significant intervention tool for which an intrusive academic advisor may have at their disposal. Academic mentoring can be defined as an individual who is more experienced and successful academically, providing wise counsel, strategies, and advice to a student who possesses little experience or has a history of academic difficulty (Campbell & Campbell, 2007). As the emphasis in higher education is on mobilizing effective retention programs and services, a faculty and peer mentoring program may provide significant benefits to first-year and academically at-risk students (Ragins & Cotton, 1999; Seibert, 1999). In addition to providing campus intervention and engagement which is critical to student persistence and retention as lauded by Tinto (1993), reasons for mentoring include: institutional goals such as recruitment and retention, pedagogical goals such as increasing learning, and enhancing relationships with faculty and other students (Upcraft, 1989).

Academic mentors at colleges and universities may perform a myriad of functions. Faculty mentors are often associated with an introduction to a specific field or program, career advice, and most frequently, mentoring graduate students in research and teaching methods (Leidenfrost, Strassnig, Schabmann, Speil & Carbon, 2011). On the other hand, peer mentoring programs can be tailored to assist struggling students develop organizational skills and orientate themselves to campus support programs in a more focused and informal environment (Crisp & Cruz, 2009). Moreover, in the context of higher education, peer mentoring has proven to be an effective way to support both undergraduate as well as graduate students (Jacobi, 1991). Effective peer academic

mentoring can be a cost-effective method of providing increased academic support and intervention under the supervision of an intrusive academic advisor.

The data generated through effective peer mentoring sessions may provide information critical to preventing academic failure by alerting the advisor to intervene in a real-time manner and provide the appropriate academic support. According to Bradley and Blanco (2010), The Academic Support and Developmental Studies Office at Delta State University helps students build the skills necessary for success in college courses. It utilizes several upper-level students as peer mentors and tutors to assist in strengthening students' study skills, reading comprehension, and time management.

Rodger and Tremblay (2003) studied the effects of peer mentoring on first year college students and found that students who continued to utilize peer mentoring services throughout the semester had significantly higher grades than students in the control group who received no such intervention. Cosgrove (1986) found that mentored students expressed greater satisfaction with the university environment and made increased developmental gains when compared to a control group. Thile and Matt (1995) studied a group of mentored students in an undergraduate mentoring program and found that mentored students performed better than the university-wide average in GPA and retention.

Campbell and Campbell (1997) reported mentored undergraduate students performed better academically than non-mentored undergraduates with same entering GPA, gender, ethnicity, and class level. Further, Campbell and Campbell (2007) found a significant difference between a student-group receiving peer mentoring versus a control group that did not. They reported that mentored students had better academic outcomes at the end of the first year. By the end of the year, mentored students had higher grade point

averages, although it was not sustained over time. The study also concluded that mentored students completed more academic hours over the year and the trend increased over time. Furthermore, they reported that mentoring played a significant role in retention as the dropout rate was twice as high for the control group than it was for the mentees (26% vs. 15%). This disparity continued through graduation at a slightly reduced rate (58% vs. 52%).

As the research indicates, peer mentoring utilizing an academic support paradigm, can be an effective tool to enhance student academic performance and persistence. Not only does it provide the campus engagement pieces that are congruent with Tinto's (1992) model of student retention, but also congruent with Glennen's (1975) studies in intrusive advising. A well trained and staffed peer mentoring program engages the student with a familiar contemporary that can provide guidance and strategies for success, and may also act as a beacon for students who feel intimidated or lost in their first year college experience. Moreover, a comprehensive mentoring program could be a valuable modality for academic advisors to utilize in order to collect additional academic performance data and intervention results from at-risk or struggling students.

### **Guided Study Hall**

In addition to required participation in services, guided study hall appears to be another academic support service uniquely offered to one subpopulation on a university campus: student athletes (Hollis, 2002). Historically, traditional study hall has been used from the elementary through secondary levels of education, to assist children in developing study skills and to achieve homework completion. In recent years, guided study hall has replaced the traditional study hall model by providing access to tutorial support, study

skills, and supplemental instruction at many levels (Dicken, Foreman, Jensen, & Sherwood, 2008).

There have been numerous studies that indicate that guided study hall is an effective intervention strategy for assisting students to complete homework and assignments at the elementary and secondary level (Dicken et al, 2008; James, 2000, Van Gessel, 2012; Chung & Hillsman, 2005). It has also been shown to be vastly superior to traditional study halls where students were required to sit in a quiet classroom or library table and left to their own devices as to whether they would use the time to complete assignments or not (Dicken et al, 2008; Szeker, 2003). Although traditional or guided study halls continue to be utilized in elementary and secondary education, little research has been done to examine the efficacy of the utilization of this intervention strategy at the post-secondary level. Moreover, the only mention of utilization or efficacy of traditional or guided study hall in a post-secondary setting is in the academic support literature for Greeks and student athletes (Hollis, 2002; Jordan & Denson, 1990; Oklahoma State University, 2014; Tennessee Technological University, 2014; Student Life Studies, 1997).

The lack of attention given to study hall effectiveness research at the post-secondary level may be a direct result of post-secondary institutions not offering such services under the auspice that undergraduate college students “should have the requisite self-regulation and academic skills necessary to manage their courses at this level of education”. This is only speculation, but this approach correlates strongly with the prescriptive advising paradigm that has been traditionally employed, and presumes that students will take the initiative to contact their advisor or in this case, instructor, when in need of assistance (Conklin, 2009).

Where institutions of higher education continue to study and struggle to find additional support services for their general student population to improve retention and graduate rates, sub-populations such as Greeks and student athletes may already have access to guided study hall services. For example, student athletes at Middle Tennessee State University have access to these services through the “Academic Plan” program:

The academic plan is an objective based program where student-athletes are assigned to study table hours and complete daily objectives to ensure their work is completed on a scheduled basis. Study hall is available to all student-athletes during the hours of 7:00 AM - 10:00 PM Monday - Thursday and 7:00 AM - 4:30 PM on Friday. The Student-Athlete Enhancement Center consists of a computer lab, private tutoring rooms, private study rooms, and study tables. A full-time staff member, mentors and tutors are available to provide assistance and to monitor academic progress (Middle Tennessee State University, 2014, p. 1).

This method of integrated academic support, where a variety of academic intervention strategies and modalities may be employed, is noticeably similar to the methods found to be effective in establishing the requisite study skills necessary for academic success purported by the findings of (Dicken et al, 2008; James, 2000, Van Gessel, 2012; Chung & Hillsman, 2005) at the elementary and secondary education levels. As the guided study hall modality continues to be an effective resource for enhanced academic performance at the elementary and secondary levels and in post-secondary populations that have access to these services, guided study hall will be examined in this study to determine its efficacy in a post-secondary setting.



## **Tutorial Services**

As with the individual academic support programs that are being offered at colleges and universities, tutorial services are a critical component to assist students in developing academic skills and achieve success which directly impacts persistence and retention. According to Miller (2000) peer tutoring programs are being developed and implemented with other campus units to increase accountability, provide increased assessment, and improve student academic performance and retention outcomes for various stakeholders, including administrators, instructors, and students.

Tutoring is described as a supplemental learning experience in which one person (tutor) supports and promotes the learning of another individual (the tutee) or group of individuals (Kersaint, Dogbey, Barber & Kephart, 2011). Hock, Deshler and Schumaker (1999) report two exclusive models of tutoring described as instructional and assignment-assistance. These models differ regarding the intent and the engagement of the tutor providing academic support. Instructional tutoring is described as a process where tutors: (a) analyze the assignment to assess the skills needed to complete the assignment by the tutee, (b) assess the student's current level of skill and strategy ability per the subject matter, (c) instruct the student through explanation, modeling, strategies and content knowledge, (d) provide sustained corrective feedback, and (e) provide immediate feedback and assistance on current assignments to make sure they are completed and the student does not fall behind (Kersaint et al, 2011).

In contrast, the major impetus of assignment-assistance tutors is to provide assistance based on the assignment that the student brings to the tutor's attention. Therefore, the object of assignment-assistance based tutoring focuses on: (a) providing

small-group or one-on-one homework completing assistance, (b) reviewing course content with the student, (c) providing feedback on student content-related performance, and (d) focus on the content of the assignment rather than skill acquisition or specific learning outcomes (Kersaint et al, 2011).

In both methods of formal tutoring, the fact that students have access to individualized attention to assist them in overcoming an academic obstacle is critical to their ultimate success. Moreover, research has suggested that peer-tutoring may be a more effective method of delivery as peers are often considered the most powerful influence in undergraduate education, even more so than advisors and instructors (Ender & Newton, 2000; Garside, 1996). Many research studies have found a positive effect of one-on-one and group tutoring on student academic performance. Hodges (2001) found that tutoring plays an important role in at-risk students' academic success (i.e., grades and retention), course completion, and graduation. Laskey and Hetzel (2010), found that:

Tutoring had a positive effect on at-risk students' retention and GPA, students who were retained utilized tutoring services significantly more than students that were not retained. When students came to tutoring on a regular basis-at least once a week-they received higher grades, which, in turn, led to achievement in their classes and, invariably to their retention (p. 39).

Irwin (1980) studied the effect of tutoring on students in a statistics class and randomly assigned half the class to tutoring while the other half received no such support. Students at all levels of achievement who received tutoring earned significantly higher final grades than those receiving no tutorial services. Further, she replicated the study (Irwin, 1981) and again found significant grade differences.

Peer tutoring has also been demonstrated to assist students with learning disabilities which can have a profound effect on academic performance and success. Reinheimer and McKenzie (2011), found that consistent peer tutoring had a significant impact on student's academic performance and retention in college. In addition, they found students that were tutored had a lower incidence of course withdrawal and a higher incidence for graduation. Gimblett (2000) found that successful peer tutoring occurred when tutoring was done by students who had learning disabilities themselves. The focus of these tutoring sessions was on developing self-awareness, self-advocacy, communication skills, and the ability to deal with one's disability in addition to covering content based subject matter. This study was conducted over a two year-cohort period and results indicated that learning disabled students who participated in the program developed a significant improvement in self-image and a smoother transition into college life.

According to the literature, the causal effectiveness of tutoring and increased academic performance may reside in the ability of the student to feel more comfortable in a one-on-one environment rather than asking questions or being singled out in a classroom setting (Heisserer & Parette, 2002). Moreover, creating a connection between students and university practitioners whether they are student mentors, faculty members, support personnel, or academic tutors, communicate to students a sense of attention or acceptance which can enhance student self-efficacy, confidence, and ability to be successful academically. Additionally, as related to retention, students that feel more likely to be successful in their academic pursuits are more likely to stay in school (Tinto, 1999).

As the extensive review of the literature on peer tutoring outcomes suggests, this method of academic support is viewed as a positive modality to improve academic

performance and retention. However, one aspect that is still being debated among researchers is the most effective and cost-effective method of delivery for tutorial services. According to Cooper (2010), many colleges and universities choose not to, or cannot afford to, make individual tutoring available for all of their students. As a result, many institutions have developed tutoring centers or learning labs where they can provide tutorial support to a number of students simultaneously. Moreover, Cooper (2010) found that in these *drop-in* mass tutoring centers students who attended significantly more (i.e., at least 10 times in a semester) performed significantly better academically than their peers who did not attend frequently. These results are consistent with the aforementioned literature which indicates that access to, and utilization of, tutorial services will increase academic performance and retention through either increased cognitive mastery or socialization (Laskey & Hetzel, 2010; Irwin, 1981; Reinheimer & McKenzie, 2010; Tinto, 1999).

Best practices in implementation of campus-wide tutorial services have been suggested by Bradley and Blanco (2010) as having at least one professional coordinator, many student peer tutors, and sometimes other professional staff, even faculty. The centers serve all students and provide free tutoring in many general education courses as well as math and English.

During the report generated by SREB, the Academic Advising and Retention Center (AARC) at Western Kentucky University earned high marks as a model program for campus-wide academic support and tutorial services. According to the report:

The AARC is the most visible example of investment in student success. Housed in an attractive, convenient location in the Student Success Center, the AARC

provides academic advising, retention services and supplemental instruction; its services are expanding to the residence halls. The emphasis on advising has increased and has intrusive advising. The AARC has a strong selection and training program for tutors, and it offers free tutoring for students in more than 100 general education courses (Bradley & Blanco, 2010, p.44).

Based on these retention initiatives, graduation rates rose from 41 to 49 percent from 2002-2006 (Bradley & Blanco, 2010). This unique program reinforces that if institutions are willing to put forth the investment in providing comprehensive academic support to their students then they may earn a positive return through increased student retention and graduation rates. This hypothesis is consistent with the previously referenced statement by Tinto (2007) where he challenged institutions to contribute more resources and energy towards support and retention plans as well as challenging faculty to come out from behind the podium and directly engage their students.

Therefore, it seems plausible that if institutions are willing to shift the paradigm and commit fiscally and organizationally to research-based student academic support, they might pave the way to eliminating retention and graduation issues nationwide. As such, this study will examine the following subgroups in an undergraduate setting, where each has access to different levels of academic support, to determine if access and investment of academic support services determines increased academic performance and graduation rates.

## **Required Participation in Academic Support Services**

Although there is large body of research involving theories and practice of student retention and academic support related to retention in higher education, little has been done to examine the relationships between services and most importantly, required student participation in those services. In this case, required student participation may be an important variable in academic support and student success and retention. It is stated in the hypothesis that students with more access to academic support services will perform better than those that do not. This study will also examine those who are required to participate in academic support activities and determine if there is a significant difference between those who have access, but are not required to attend. For example, Troiana, et al (2010), reported that students who utilized the learning resource center more consistently had higher cumulative grade point averages than students who did not attend, or attended less consistently. Moreover, students who had failing grade point averages typically attended less than 50 percent of scheduled appointments.

As institutions continue to appropriate more and more funds to campus retention programs, the shift from access to requirement needs to be examined. One such method of requiring students to attend academic support sessions is the use of the academic contract. This medium is used by many institutions in their student advisement offices, tutorial centers, and programs for at-risk students to define the responsibilities of the student and the institutions toward specific academic or graduation related goals. Further, the contract provides the student with a plan that can lead to a degree and provide them with a sense that the institution is paying attention to them and engaging their needs (Bradley & Blanco, 2010).

While institutions may be moving in the right direction by attempting to hold students accountable, there is little in the way of an extrinsic “carrot” to provide increased motivation to follow-through with a contract agreement and succeed. One student subpopulation that is an exception are student-athletes. A more detailed description of this unique student population will be discussed later in this study; however, what may have a significant difference on the retention and academic success of student-athletes is a system-wide requirement for first-year and at-risk students to attend all prescribed academic support activities or receive powerful consequences.

It is clearly stated in four separate sections in the National Collegiate Athletic Association’s (NCAA) (2009) description of academic support service center for student athletes best practices, that “consequences for not attending (a) tutorial services, (b) study hall, (c) class, or (d) academic advising services should be developed in conjunction and enforced by coaches” (pp.6-8). Consequences can often range from corporal punishment, to loss of playing time or scholarship for chronic offenders. By providing powerful consequences for academic support service attendance, the NCAA and athletic departments have significantly improved academic performance, retention, and graduation in a population that was otherwise underachieving (NCAA, 2011). The recent academic success by this subpopulation might have identified a significant link between required attendance in academic support services and increased academic performance among college students.

## **Student Athlete Academic Support**

Student-athletes at most major colleges and universities make up a very unique population. They are faced with many time constraints in particular, which may hinder their ability to sufficiently allot time to their academic success. As such, Jolly (2008) states “time demands and rigid scheduling are factors of the student-athlete experience that stand out the most” (p. 146). Moreover, Debolt, Marcum, and Kennedy (2011), state that “student-athletes must tailor their academic schedule around their athletic schedule. This often involves attending classes in the morning, practicing in the afternoon, going back to class at night, and studying whenever he or she has a free moment” (p. 90).

In addition to time constraints and physical rigors, student-athletes may also feel isolated from the rest of the campus community due to their unique training and competition schedules. Moreover, they may have difficulty managing academic and athletic success and failure, optimizing physical health to minimize injury, maintaining multiple relationships with parents, coaches, friends, and community, while learning to cope with the termination of an athletic career (Parham, 1993). Chartrand and Lent (1987), also indicated that in addition to facing the common issues related to the college transitions such as living away from home for the first time, developing new social groups, and assuming responsibilities of self-discipline, student-athletes also face other significant hurdles throughout the course of their college experience. They identify balancing academic and athletic roles as the most critical.

While it is evident in the literature that the major obstacle facing college student-athletes is the ability to make time for their academic and athletic pursuits, another factor



that has been identified is some of these student-athletes gain admission to colleges and universities through their special talent. Graham (2012), reported that:

Student-athletes are consistently admitted to college and universities with academic backgrounds significantly lower than their cohorts. As a consequence, these student-athletes sometimes have difficulty matriculating and require a lot of academic support to meet degree benchmarks (p.1).

This unique dynamic is further described in an Associated Press (2009) review of data collected by the NCAA regarding student-athlete special admissions among the 120 Bowl Subdivision institutions, utilizing public records laws to secure the otherwise private information. According to the review, at least 27 institutions were identified where student-athletes were at least 10 times more likely to benefit from special admissions programs than students in the general population. In all, 77 of 92 institutions that provided information to the Associated Press reported using special admissions waivers to admit student-athletes and other students with particular talents. 10 schools did not respond to the request and 18 private institutions declined to release their reports. While this report is alarming in reference to how many prospective student-athletes could be admitted into an institution academically underprepared, it is permissible under the NCAA initial eligibility rules and regulations.

According to Principle 2.5: *The Principle of Sound Academic Standards*, in the NCAA manual (2014):

Intercollegiate athletics programs shall be maintained as a vital component of the educational program, and student-athletes shall be an integral part of the student body. The admission, academic standing and academic progress of student-athletes

shall be consistent with the policies and standards adopted by the institution for the student body in general (p. 4).

In other words, institutions are left to their own devices on what kind of student they choose to admit as long as they realize there may be a consequence if those students do not graduate. This statement is supported by a quote by Kevin Lemmon, NCAA vice-president for academic and membership affairs, stating “while it’s an institution’s decision on who they bring in, we’re most interested in what they do once they get there. And if they’re not successful, there are consequences” (Associated Press, 2009, p. 3).

Based on the evidence in the literature describing the demands placed on student-athletes to manage their time and academic and athletic pursuits, as well as the reports of academically underprepared students earning admission through special admissions programs, it would appear that colleges and universities have difficulty retaining and graduating student-athletes. However, based on the data recorded by the NCAA (2011), this is not the case:

Even when measuring student-athlete academic success using the less-accurate Federal Graduation Rate, Division 1 student-athletes who began college in 2004 graduated at a 65 percent rate, also the highest ever and two points (63 percent) higher than the general student body (p.1).

Moreover, male African-American student-athletes graduated at a 50 percent rate, 12 points higher (38 percent) than African-American students in the general population. Female African-American student-athletes graduated at a 69 percent

rate, 20 points higher (46 percent) than African-American students in the general population (NCAA, 2011).

After increased academic support services were implemented by Middle Tennessee State University in 2004 to combat nationally low APR scores and six-year graduation rates (Steinbach, 2007), student-athletes who entered college in 2005 graduated at 63 percent, compared to students in the general population (45 percent) and when entering in 2006, student athletes graduated at 66 percent compared to students in the general student population (46 percent) (NCAA, 2015). These data are compelling, given the documented difficulties student-athletes face attempting to matriculate through the college or university, or gaining admission to the institution itself. Furthermore, it begs the question: Given these circumstances, how is it possible that student-athletes graduate at a higher rate than their non-athlete peers?

Anecdotally, some have suggested that they are in “easy majors” or are “clustering in certain easy majors”, or have gone even so far as stating that it is an insult to the university (Gurney, 2011). However, research indicates that the recent wide-spread academic success of student-athletes resides in the access student-athletes have to comprehensive academic support programs and student academic accountability. What is more interesting, is that researchers have failed to examine how the student-athletes are “doing it” and then transfer these processes into the general student population to analyze what effect it may have on student retention and graduation.

Due to a realization of the complexity of the student-athlete population, university administrators in the 1970’s and 1980’s began to develop and implement academic support centers for student-athletes as a method of retention and to protect their monetary

investment (Grites, 1982). Over the course of the next several years, academic support programs have evolved into multi-million dollar centers that offer services ranging from mandatory monitored study time, tutors for general education and major subjects, academic mentoring, academic progress report monitoring, academic advising, and counseling (Hollis, 2002). Moreover, athletic academic advisors use intrusive advising with their students including: progress monitoring, academic performance enhancement, communication with coaches and administrators, and assigning peer mentors and tutors (Jordan & Denson, 1990).

According to the Student Athlete Enhancement Center webpage (Middle Tennessee State University, 2013a) at Middle Tennessee State University, their program offers: intrusive academic advising, progress monitoring, tutorial services in all subject areas, peer mentoring, goal/objective based study hall (peer mentoring included), and class attendance checking.

As the academic support movement for student-athletes began to take shape, the NCAA (2014) made academic support mandatory for their member institutions by writing into their bylaws (16.3) that:

Member institutions shall make general academic counseling and tutoring services available to all student-athletes. Such counseling and tutoring services may be provided by the department of athletics or the institution's non-athletics student support services. In addition, an institution may finance other academic and support services that the institution, at its discretion, determines to be appropriate and necessary for the academic success of its student athletes (p. 221).

It is difficult to ignore the possibility of a significant relationship between student-athlete academic success and comprehensive academic support. Although these centers typically reside in the institution's athletic complex (Pope & Miller, 1999), their operating procedures reflect the positive outcomes discussed in the retention literature in academia (e.g., Tinto, 1975; Laskey & Hetzel, 2010; Irwin, 1981; Reinheimer & McKenzie, 2010; Tinto, 1999; Pascarella & Terenzini, 1991; Campbell & Campbell, 2007; Gansemer-Topf & Schuh, 2006). What may be most noteworthy, however, is why the NCAA and college athletics are taking the lead on investing in academic support and accountability, while academia continues to search for answers to their retention and graduation issues? One can only speculate, but the data indicate that an examination of a possible significant relationship between access to comprehensive academic support services and retention must become a priority.

### **Fraternity and Sorority Academic Support**

Students participating in fraternities and sororities (Greeks) another subpopulation being examined in this study and are the group that receives more intrusive academic support than the general student population. However, what is more interesting about examining this group is what effect socialization may have on academic performance and graduation. It has been postulated by Tinto (1993) that socialization may be an important variable in retention and being affiliated by clubs such as intramural and intercollegiate athletics, student government, sororities and fraternities, concerts, lectures and other activities. Additionally, studies (Astin, 1977; Thorson, 1997) indicate that Greek members tend to be more involved and that involvement is positively related to student learning and intellectual development. However, critics of the Greek system have pointed to research

indicating that students that participate in Greek life show higher levels of alcohol use (Weshsler, Kuh, & Davenport, 1996), lower levels of personal development (Wilder, Hoyt, Surbeck, Wilder & Carney, 1986), and lower levels of academic achievement (Blimling, 1993). Moreover, Maisel (1990) reported that Greek affiliation can have negative effects on students learning and intellectual development.

A study by Pike (2003) involving 6, 782 undergraduates at 15 AAU public research universities revealed that Greek affiliation had a weak positive relationship with engagement and gains in learning. Further, over the matriculation period, the positive effect of Greek participation was stronger for seniors than first-year students. Moreover, Pike (2003) reported that the reason for these results was “they had more positive perceptions of the campus environment and reported greater gains in their personal development” (p. 377). A possible variable related to this outcome may also reside in access and utilization for academic support services.

In a study performed at the University of Missouri-Columbia found that Greek students reported substantially higher levels of academic and social involvement, compared to their non-Greek counterparts (Student Life Studies, 1997). The results of these studies are congruent with the academic success information publically posted on several college and university websites.

According to the Student and Greek Life website at Oklahoma State University:

The fraternity and sorority community makes academics a top priority knowing your student is at OSU to get an education. Many chapters have an academic development program which enforces a strict academic policy that included maintaining a respectable grade point average to participate in chapter activities.

Further, each fraternity and sorority has its own scholarship program that will help students succeed academically as well as learn to effectively manage their time away from classes. Scholarship programs can include study hours, mentors, support technology and/or study files (Oklahoma State University, 2014, p.1).

In addition, the website indicated that for the fall 2012 semester, Greek participants had a cumulative grade point average of 3.12 as compared to the general student population (2.82). Moreover, they indicated that the 6 year graduation rates were higher for Greek participants than the general population (Oklahoma State University, 2014). A report posted publically on the Tennessee Tech Greek Life student activities website states:

The academic portion of your university career is one significant determinant in your future success. One of the most important purposes of the Greek community is to encourage and develop high scholastic achievement among its members. Several factors contribute to this academic atmosphere including: peer tutoring, upperclassmen counseling, and chapter study hours which introduce new students to the longer and more intense studying that college requires (Tennessee Technological University, 2014, p.1).

This website also indicates that Greek participants graduate at a significantly higher rate (68 percent) as compared to the general student population (51 percent) (Tennessee Technological University, 2014). Although the data purporting the positive effect of Greek participation and academic performance in the two examples cited is anecdotal, it is consistent with the findings of (Astin, 1977; Thorson, 1997; Pike, 2003) who reported a positive relationship between Greek participation and positive academic outcomes.

Tennessee Technological University is a peer institution with Middle Tennessee State University under the Tennessee Board of Regents and it will be interesting to examine any similarities or differences in academic outcomes of Greek participants among both institutions. While there is no retention or graduation data posted or publically available, Middle Tennessee State University Greek societies have offered academic support services in the categories of peer academic mentoring, intrusive advising, and access to university sponsored tutorial services since the 2004-05 academic year (Middle Tennessee State University, 2005). Moreover, as a strategic measure to support the university during the Complete College of Tennessee Act in 2010, campus life administrators partnered with the Greek societies to create a strategic plan to improve these services through formal integration. As such, Middle Tennessee State University indicates in objective 2.2, 2.3 and 2.4 in the Strategic Plan for Fraternities and Sororities 2011-2016 document (Middle Tennessee State University, 2011), that they will “2.2 create a fraternity/sorority tutoring program and provide academic mentoring/support for fraternity and sorority students. 2.3 Improve chapter utilization of the Faculty Advisor and 2.4 improve communications and interaction with the university faculty” (p. 6). As with the student athlete population being examined, Greek participants are beginning or have already moved to a comprehensive academic support retention model and it is hypothesized that this will have a positively significant effect on academic performance and graduation outcomes.



## **General Student Population Academic Support**

As it has been outlined in the previous sections, certain subpopulations among college and university students have access to more inclusive and comprehensive academic support services. Students not affiliated with a particular subpopulation may have to be more persistent to seek out support services or be willing to pay some of the cost. As of the 2012-2013 academic year, Middle Tennessee State University had no self-contained services for non-affiliated students (Middle Tennessee State University, 2012a). While they did offer academic advising in each major college for declared major students and the University College Advising Center (UCAC) for undeclared students, as well as modest tutorial assistance and a math and writing lab, these services were not as interconnected, accessible, intrusive, or as well-staffed as the services provided to the aforementioned subpopulations.

Unlike in the individual colleges, academic advising in the UCAC moved towards an intrusive academic advising model in 2013. However, as a result of several student success initiatives, the UCAC was disbanded in 2014, and intrusive advising and student success services were absorbed by each college (Middle Tennessee State University, 2014). In spite of this progressive undertaking by the university, the restructured advising approach and organization was not in effect during the cohort years that will be measured in this study. As such, for the purpose of this study, academic advising was performed in each student's college and undeclared students were serviced by the UCAC through the cohort graduation year 2012-2013. Expectations for academic advisors and students during this matriculation period included: Year 1: contacting the advisor; getting familiar with campus resources; Year 2: completing general education requirements, exploring

student organizations related to the major, begin networking with peers and faculty in the major; Year 3: research career options and graduate programs; Year 4: finalize career/postgraduate plans and complete exit exams (Middle Tennessee State University, 2012a). This organization of services is more consistent with prescriptive or informational advising where the onus resides with the student (Conklin, 2009; Yarborough, 2010).

This prescriptive approach was not limited to academic advising at Middle Tennessee State University, but also manifested itself in the organization of academic support and tutorial services offered to the general student population. Tutorial services for the general student population were offered through individual departments and available through an online information site (Middle Tennessee State University, 2012b) where students determined what subject tutoring is offered and what time it is available. Once again, the impetus was on the student to make themselves available and schedule their own appointments. Moreover, while the previously mentioned subpopulations have access to tutoring services in all general education courses as well as some major courses, the general population student may only have access to math, English, or a handful of other general education classes. Ideally, a centralized center for academic advising and academic support and tutorial services as described by the SREB (Bradley & Boykin, 2010), would appear to be a more salient method of supporting general population students academically and socially.

Although the premise of the previous sections places emphasis on institutional accountability for retaining its students, it must be noted that this approach does not excuse the personal responsibility of the student to prepare for their courses, complete assignments, or attend class regularly. Rather, it is an investigation as to whether

providing academic support by the institution to provide assistance for a student's academic needs and to serve as a compliment to instruction provided by the faculty, has a positive effect on academic success and graduation. Furthermore, based on the increased emphasis on retention, graduation, and implementation of student support services, and the great disparity of services offered between certain campus subpopulations and the general student population, the purpose of this study is to demonstrate the need for academic support based retention measures and to illustrate how current academic support models positively influence academic performance in those populations that have access to them.

## CHAPTER III.

### METHODOLOGY

#### Subjects

A dataset of graduation, entry type (first-time freshmen or new transfers), credit hours attempted, ACT score, and High School GPA for student athletes, Greeks, and the general student population was created by importing data through a Computer Printout Dataset requested by the investigator from the Middle Tennessee State University Records Office. These data were analyzed using The Statistical Package for Social Sciences (SPSS). This dataset contained graduation data for all three categories of access to academic support for the graduation years: 2007-2012 inclusive.

For the purpose of this study, cohort years 2001-02 through 2005-06 were selected as they were the most recent six-year cohort data representative of student athletes that had access to improved academic support services at the institution during academic reform implementation as initiated by the NCAA, academic support initiatives implemented for Greek students, and for students in the general student body that matriculated prior to the student success initiatives implemented by the university in 2013. Moreover, a six-year cohort graduation period was used as this is the interval used and reported for Federal Graduation Rates. A total of 27,176 students ( $N = 25,729$  general population, 741 student athletes, 722 Greek students) from five cohort years were identified for analysis.

To follow appropriate University records request protocol, the investigator submitted an exempt review application to the Institutional Review Board (IRB). As the dataset was retrieved from a public database they had no identifiers as to the identity or

personal information of any of the subjects in the analysis, and therefore, no informed consent, disclosure, or confidentiality documentation was required.

### **Research Design**

This study adopted an ex-post-facto research approach. This is an after-the-fact design. According to Lord (1973):

The causal comparative method or ex-post-facto method of research seeks to establish causal relationships between events and circumstances. In other words, it finds out the cause of certain occurrences or non-occurrences. This is achieved by comparing the circumstances associated with observed effects and by noting the factors present in the instances where a given effect occurs and where it does not occur (p. 4).

This approach “does not involve the manipulation of variables and it neither adds to nor subtracts from the existing facts. It observes carefully and records information as it naturally occurred at the time the study was conducted” (Bakare, 2012, p. 5010). Potential strengths to this type of research is that it “yields useful information concerning the nature of phenomena: what goes with what, under what conditions, in what sequences and patterns” (Lord, 1973, p. 4).

Potential limitations or weaknesses of this type of research are derived from “the lack of control over independent variables. Within the limits of selection, the investigator must take the facts as he finds them with no opportunity to arrange the conditions” (Isaac & Michael, 1971, p. 22). Moreover, ex-post-facto research, while a useful design in non-experimental conditions, is considered quasi-experimental and not able to prove causation (McMillan & Schumacher, 2001). As such, variables in this study were measured using

the technique of archival research, which “involves using previously compiled information to answer research questions. The researcher does not actually collect the original data. Instead, he or she analyzes existing data” (Cozby, 2004, p. 118). In this case, the data analyzed consisted of enrollment statistics and graduation records archived by Middle Tennessee State University.

Data obtained directly from these records were coded in a SPSS database, which was used as the primary instrument to analyze the variables of interest. The subjects in the MTSU dataset were transformed into 35 categories by student type: white or non-white, men or women, ACT score below 20 and above 20, high school GPA below 2.75 and above 2.75, student body, Greek, or student athlete, and their corresponding cohort year (2001-06). The high school GPA category was set at the average of the minimum guaranteed admissions requirements at Middle Tennessee State University for the cohort years: 2001-03 (2.80) (Middle Tennessee State University, 2001) and 2004-06 (2.70) (Middle Tennessee State University, 2004). The ACT category was set at the average of the minimum guaranteed admissions requirements at Middle Tennessee State University for the cohort years: 2001-03 (20) (Middle Tennessee State University, 2001) and 2004-06 (19) (Middle Tennessee State University, 2004). It should be noted, however, that for the 2001-03 cohort years, students needed to have either a 2.80 high school GPA *or* an ACT score of 20, whereas students in the 2004-06 cohort years needed a 2.70 high school GPA *and* an ACT score of 19. The dependent variable was graduation, the independent variable was access to academic support, and the control variables were: race, sex, ACT score, and High School GPA.

As access to academic support was not included in the original dataset, the investigator assigned a value to the number of academic support services each student had access to at the time of matriculation. As mentioned in the review of literature, these services included: intrusive academic advising, academic mentoring, guided study hall, tutorial services, and required participation in services.

The investigator assigned a number for each academic service the groups had access to during their matriculation time. Based on the information provided in the literature review, the general student body at MTSU in the cohort years 2001-2006 had access to just tutorial services (Middle Tennessee State University, 2012a) and were assigned the number 1. Student athletes at MTSU in the cohort years 2001-2006 had access to: intrusive academic advising, academic mentoring, guided study hall, tutorial services, and required participation (Middle Tennessee State University, 2013a), and therefore, were assigned the number 5 for analysis. Greek students in the cohort years 2001-2006 had access to: intrusive academic advising, academic mentoring, and tutorial services (Middle Tennessee State University, 2005), and therefore, were assigned the number 3 for analysis.

### **Analysis of the Data**

It was discovered by the investigator that the variables student type and access to academic support services were redundant for analysis. Therefore, student type (general student, Greek, or student athlete) were used interchangeably with access to academic support services in this analysis.

In order to test the first research hypothesis, likelihood of graduation events between the independent variable on the dependent variable, Chi-square tests and rate

ratios were calculated to determine if there was a significant relationship between discriminating groups and the likelihood of graduation events for each group.

In order to test the second research hypothesis, the efficiency of graduation events between the independent variables and the dependent variable, a survival analysis was performed to examine the “event” of student graduation over time among multiple groups. For the purpose of this study, a survival analysis was performed on the general student body, Greeks, and student athlete subgroups for graduation (event) by the number of credit hours attempted (time). In addition, a Cox regression model was created for each independent group to produce a hazard function which gives for every time, the probability of surviving (not graduated yet), or not surviving (graduating) up to that time. “The hazard function gives the potential that the event will occur, per time unit, given that an individual has survived (not graduated yet) up to that specified time” (Despa, 2013, p. 1).

### **Chi-Square and Rate Ratio Analysis**

The Chi Square test is one of the most used out of the nonparametric statistical tests. It is used to test the association or independence of the frequencies of two different groups, whether or not there is a difference in their distributions, and the degree for which that difference is due to chance or probability (Key, 1997). The assumptions for carrying out a valid Chi Square test are as follows: data must be in frequency form (nominal data or greater), each subject can only be included once, data must have a precise numerical value and organized into categories or groups, and the sample size must be greater than twenty (Key, 1997).

The rate ratio, or also referred to as common odds ratio, “evaluates whether the odds of a certain event or outcome is the same for two groups. Specifically, the odds ratio



measures the ratio of the odds that an event or result will occur to the odds of the event not happening” (McHugh, 2009, p. 120). For the purpose of this study, graduation rates were calculated by (number of graduates divided by number of participants) for each group of the independent variable per 1000 graduation events. Rate ratios comparing graduation rates by student access to academic support services (5, 3, or 1) were computed by: (1) dividing the graduation rate of access to five academic support services by the graduation rate of access to one and three academic support services, (2) dividing the graduation rate of access to three academic support services by the graduation rate of one and five academic support services, and (3) dividing the graduation rate of access to one academic support service by the graduation rate of access to three and five academic support services. Ninety-five percent confidence intervals were also computed for all rate ratios and provided information on the accuracy of each ratio.

The interpretation of the ratio rate results is directly related to the value of the odds ratio. If the ratio is .001 to .999 then the variable in the numerator (variable of interest) will be *less likely* to experience a graduation event than the variable in the denominator (reference variable). Conversely, if the ratio is 1.01 or greater, the variable in the numerator will be *more likely* to experience a graduation event than the variable in the denominator. If the odds ratio is 1.00, then there is an equal chance of both variables experiencing a graduation event (McHugh, 2009).

## Survival Analysis

According to Despa (2013), “survival analysis is generally defined as a set of methods for analyzing data where the outcome variable is the time until the occurrence of an event of interest. The event can be death, occurrence of a disease, marriage, divorce etc. The time to event or survival time can be measured in days, weeks, years, threshold intervals, etc” (p. 1). Moreover, survival analysis can take into account an event that may not happen in the allotted timeframe by continuing to include those observations in the analysis. In cases where the specific event is not observed are called censored observations (Ludwig-Mayerhoffer, 2010). For the purpose of this study, participants that did not graduate (the event) within the specified attempted credit hours (time) were considered *right censored*. In this case, right censored means that the survival time for this person is considered to be at least as long as the duration of the study (e.g., 120 to 200 attempted credit hours) (Despa, 2013).

The time continuum that was set for this study and depicted graphically, began with a baseline of zero credit hours attempted in the left corner of the x-axis and ended at two-hundred credit hours attempted to the right on the x-axis. For analysis, graduation events were measured in 10 credit hours attempted intervals along this continuum. The y-axis depicted how often a graduation event occurs for students among the three independent groups: Greeks, student athletes, and the general student population over the period of the time continuum.

For this study a survival analysis was a particularly useful tool, as the investigator was able to determine if certain subgroups graduate over a *shorter period of time* (e.g., 120 credit hours attempted versus 180 credit hours attempted). This may be of particular

import as students may not persist beyond a certain credit hour threshold due to psychological factors such as lack of positive reinforcement (e.g., “I’m no closer to my degree than I was last semester”) which may lead to a decreased motivation to persist. In addition, financial ramifications such as reduced financial aid and/or loss of academic scholarship due a maximum of hours attempted, or reduced or retracted parental financial support may lead to a monetary inability to persist beyond a credit hour threshold. By examining graduation through this construct, the investigator was able to ascertain if subgroups with access to more academic support services graduate *faster* by attempting fewer credit hours towards degree completion.

### **Cox Regression Analysis**

Although there are several ways to analyze survival data, for the purpose of this study, Cox regression was used. According to Despa (2013),

A popular regression model for the analysis of survival data is the Cox proportional hazards regression model. It allows for testing for differences in survival times of two or more groups of interest, while allowing to adjust for covariates of interest. While nonlinear relationships between predictors is assumed, the hazard ratio comparing any two observations is in fact constant over time in the setting where the predictor variables do not vary over time. This assumption is called the proportional hazards assumption (p. 2).

The Cox regression analysis was selected for this study as it allowed the investigator to predict when a specific group did not survive (graduate) within a given amount of time (credit hours attempted). This statistical test was very useful in determining whether students with different access to academic support services were

more or less likely to graduate more or less efficiently than the other groups. For example, a lower graduation rate among a certain group may result in graduation events being more likely as the number of credit hours attempted increases (time) as that group will have “more potential graduates” to have an event in the future and therefore, graduate less efficiently. On the other hand, for groups that have higher graduation rates, it may be more likely to have a decrease in graduation events as the number of credit hours attempted increases (time) and therefore, graduate more efficiently.

Interpretation of the Cox regression hazard ratio is similar to that of the rate or odds ratio. However, the Cox regression also produces a correlation coefficient ( $B$ ) which also determines the direction of the result. As with the odds ratio, a hazard function value of .001 to .999 means that the variable of interest is *less likely* to have a graduation event at that point in time than the reference variable. A value of 1.01 or greater means that the variable of interest is *more likely* to have a graduation event at a point in time than the reference variable. A hazard ratio value of 1.00 means that there is an equal chance of both variables having a graduation event at the same point in time. The value of the correlation coefficient determines the direction of the hazard ratio. If the correlation coefficient is positive it means that graduation events increase over time. If the correlation coefficient is negative it means that graduation events decrease over time (Myers, Well, & Lorch, 2010).

## **Cox Regression Analysis Assumptions**

Assumptions for carrying out a valid Cox Regression analysis (Peat, Barton, & Elliot, 2009, p. 131):

- Each subject is only included once
- Survival prospects remain constant over the study period
- Censored observations have the same survival prospects as the non-censored participants.

## CHAPTER IV.

### RESULTS

Based on the increased emphasis on retention, graduation, and implementation of student support services, the purpose of this study was to investigate if academic support based retention measures have an effect on student graduation and examine if current academic support models positively influence academic performance in those populations that have access to them.

A dataset of graduation, entry type (first-time freshmen or new transfers), credit hours attempted, ACT score, and High School GPA for student athletes, Greeks, and the general student population was created by importing data through a Computer Printout Dataset requested by the investigator from the Middle Tennessee State University Records Office. It was determined by the investigator that although they were eventually organized into different groups, this dataset included the entire population of students ages 18-24 at the institution for the 2001-02 to 2005-06 cohorts.

#### **Descriptive Statistics**

Table 1 shows an analysis of the 27,176 students from five entering student cohorts ranging from 2001-2006. Student groups were categorized as general student body ( $N = 25,729$ ), student athlete ( $N = 741$ ), and Greeks ( $N = 722$ ). The data were further categorized into white ( $n = 22,552$ ) and non-white ( $n = 4,484$ ), men ( $n = 13,252$ ) and women ( $n = 13,924$ ), ACT score below 20 ( $n = 5,840$ ) and above 20 ( $n = 16,467$ ), and high school GPA below 2.75 ( $n = 5,798$ ) and above 2.75 ( $n = 18,348$ ).

Table 1.

*Characteristics of Participants that are in the Student Athlete, Greek, or General Student Body Population and Access to Academic Support Services (N = 27,176)*

| Characteristic                      | <i>n</i> | %     |
|-------------------------------------|----------|-------|
| Cohort Year                         |          |       |
| 2001-02                             | 5,315    | 19.55 |
| 2002-03                             | 5,448    | 20.04 |
| 2003-04                             | 5,412    | 19.91 |
| 2004-05                             | 5,507    | 20.26 |
| 2005-06                             | 5,494    | 20.21 |
| Entry Type                          |          |       |
| Freshmen                            | 16,104   | 59.25 |
| Transfer                            | 11,072   | 40.75 |
| Race                                |          |       |
| White                               | 22,552   | 82.98 |
| Non-White                           | 4,484    | 16.49 |
| Other                               | 140      | 0.52  |
| Gender                              |          |       |
| Men                                 | 13,252   | 48.76 |
| Women                               | 13,924   | 51.24 |
| ACT Score                           |          |       |
| Below 20                            | 5,840    | 26.18 |
| Above 20                            | 16,467   | 73.82 |
| High School GPA                     |          |       |
| Below 2.75                          | 5,798    | 24.01 |
| Above 2.75                          | 18,348   | 75.99 |
| Access to Academic Support Services |          |       |
| Student Athlete: 5                  | 741      | 2.73  |
| Greek: 3                            | 722      | 2.66  |
| Student Athlete and Greek: 5        | 16       | 0.06  |
| General Student: 1                  | 25,729   | 94.68 |
| Graduation                          |          |       |
| Graduated                           | 14,495   | 53.34 |
| Not Graduated Yet                   | 12,681   | 46.66 |

Table 2 depicts the demographic characteristics of the participant subgroup as related to their access to academic support services. The data indicate that students with access to five academic support services (student athletes) have distinctly higher percentage of entering ACT scores below 20 (48.49%) than students with access to three academic support services (Greeks) (21.78%) and students with access to one academic support service (general student) (25.69%). Students with access to five academic support services also have a distinctly higher percentage of entering high school GPA's below 2.75 (31.55%) than students with access to three academic support services (20.88%) and students with access to one academic support service (23.91%). As the student athlete group appears to have a higher percentage of students that scored lower on the widely used admissions criteria to predict college success (ACT and high school GPA), it would appear that that group would have more difficulty having academic success and graduating than the other two groups.



Table 2.

*Demographic Characteristics of Participants that are in the Student Athlete, Greek, or General Student Population and Access to Academic Support Services (N = 27,176)*

| Characteristic                                       | <i>n</i> | %      |
|--|----------|--------|
| <b>Access to Academic Support Services by Race</b>   |          |        |
| Student Athlete: 5                                   |          |        |
| White  | 426      | 57.48  |
| Non-White  | 309      | 41.70  |
| Other  | 6        | 0.008  |
| Total  | 741      | 100.00 |
| Greek: 3   |          |        |
| White  | 574      | 79.50  |
| Non-White  | 146      | 20.22  |
| Other  | 2        | 0.027  |
| Total  | 722      | 100.00 |
| General Student: 1                                   |          |        |
| White  | 21,557   | 83.78  |
| Non-White  | 4,040    | 15.70  |
| Other  | 132      | 0.005  |
| Total  | 25,729   | 100.00 |
| <b>Access to Academic Support Services by Gender</b> |          |        |
| Student Athlete: 5                                   |          |        |
| Men  | 506      | 68.28  |
| Women  | 235      | 31.72  |
| Total  | 741      | 100.00 |
| Greek: 3   |          |        |
| Men  | 434      | 60.11  |
| Women  | 288      | 39.89  |
| Total  | 722      | 100.00 |
| General Student: 1                                   |          |        |
| Men  | 12,324   | 47.89  |
| Women  | 13,405   | 52.11  |
| Total  | 25,729   | 100.0  |

Table 2. Continued

| Characteristic                                   | <i>n</i> | %      |
|--|----------|--------|
| Access to Academic Support Services by ACT Score |          |        |
| Student Athlete: 5                               |          |        |
| Below 20   | 290      | 48.49  |
| Above 20   | 308      | 51.51  |
| Total  | 598      | 100.00 |
| Greek: 3   |          |        |
| Below 20   | 149      | 21.78  |
| Above 20   | 535      | 72.22  |
| Total  | 684      | 100.00 |
| General Student: 1                               |          |        |
| Below 20   | 5,406    | 25.69  |
| Above 20   | 15,634   | 74.31  |
| Total  | 21,040   | 100.00 |
| Access to Academic Support Services By HS GPA    |          |        |
| Student Athlete: 5                               |          |        |
| Below 2.75                                       | 200      | 31.35  |
| Above 2.75                                       | 438      | 68.65  |
| Total  | 638      | 100.00 |
| Greek: 3   |          |        |
| Below 2.75                                       | 147      | 20.88  |
| Above 2.75                                       | 557      | 79.12  |
| Total  | 704      | 100.00 |
| General Student: 1                               |          |        |
| Below 2.75                                       | 5,457    | 23.91  |
| Above 2.75                                       | 17,363   | 76.09  |
| Total  | 22,820   | 100.00 |

Table 3 depicts the participant graduation percentage and access to academic support services for graduation years 2007-2012. The graduation percentage holds constant for cohort years 2001-06 (52.32%-53.34%), but is distinctly different between men (51.06%) and women (55.51%), white (54.29%) and non-white (51.56%), ACT scores

below 20 (46.58%) and above 20 (56.45%), high school GPA below 2.75 (37.56%) and above 2.75 (58.28), and between students with access to five academic support services (60.99%), three academic support services (78.39%), and one academic support service (52.43%).

Table 3.

*Characteristics of Participant Graduation Percentage and Access to Academic Support Services for Graduation Years 2007-13, (N = 27,176)*

| Characteristic     | <i>n</i> | %     |
|--------------------|----------|-------|
| <b>Cohort Year</b> |          |       |
| 2001-02            | 2,781    | 52.32 |
| 2002-03            | 2,924    | 53.67 |
| 2003-04            | 2,908    | 53.73 |
| 2004-05            | 2,980    | 54.11 |
| 2005-06            | 2,902    | 52.82 |
| Total              | 14,495   | 53.34 |
| <b>Entry Type</b>  |          |       |
| Freshmen           | 8,190    | 50.86 |
| Transfer           | 6,305    | 56.94 |
| Total              | 14,495   | 53.34 |
| <b>Race</b>        |          |       |
| White              | 12,243   | 54.29 |
| Non-White          | 2,312    | 51.56 |
| Other              | 80       | 57.14 |
| Total              | 14,495   | 53.34 |

Table 3. Continued

| Characteristic                      | <i>n</i> | %     |
|-------------------------------------|----------|-------|
| Gender                              |          |       |
| Men                                 | 6,766    | 51.06 |
| Women                               | 7,729    | 55.51 |
| Total                               | 14,495   | 53.34 |
| ACT Scores                          |          |       |
| Below 20                            | 2,720    | 46.58 |
| Above 20                            | 9,295    | 56.45 |
| Total                               | 12,015   | 53.86 |
| High School GPA                     |          |       |
| Below 2.75                          | 2,178    | 37.56 |
| Above 2.75                          | 10,693   | 58.28 |
| Total                               | 12,871   | 53.30 |
| Access to Academic Support Services |          |       |
| Student Athlete: 5                  | 452      | 60.99 |
| Greek: 3                            | 566      | 78.39 |
| Student Athlete and Greek: 5        | 15       | 93.75 |
| General Student: 1                  | 13,492   | 52.43 |
| Total                               | 14,525   | 53.34 |

Table 4 depicts the characteristics of the access to academic support subgroups and graduation percentage for the 2007-2012 graduation years. The results indicate that students with access to three academic support services have a higher graduation percentage on all variables than students with access to one or five academic support services. The results also indicate that students with access to one academic support service have a lower graduation percentage across all variables than students with access to three or five academic support services.

Table 4.

*Characteristics of Access to Academic Support Services Subgroups, Graduation Percentage for Graduation Years 2007-13, (N = 27,176)*

| Characteristic                             | <i>n</i> | %      |
|--|----------|--------|
| <b>Access to Academic Support Services</b> |          |        |
| <u>Student Athlete: 5</u>                  |          |        |
| White Men                                  | 177      | 68.07  |
| Non-White Men                              | 115      | 47.52  |
| Other Men                                  | 3        | 75.00  |
| Total                                      | 295      | 58.30  |
| White Women                                | 111      | 66.86  |
| Non-White Women                            | 45       | 67.16  |
| Other Women                                | 1        | 50.00  |
| Total                                      | 157      | 66.80  |
| ACT Below 20                               | 154      | 53.10  |
| ACT Above 20                               | 205      | 66.30  |
| Total                                      | 359      | 60.10  |
| HS GPA Below 2.75                          | 96       | 48.00  |
| HS GPA Above 2.75                          | 292      | 66.70  |
| Total                                      | 388      | 60.81  |
| <u>Greek: 3</u>                            |          |        |
| White Men                                  | 280      | 75.47  |
| Non-White Men                              | 52       | 83.80  |
| Other Men                                  | 1        | 100.00 |
| Total                                      | 333      | 76.70  |
| White Women                                | 158      | 77.83  |
| Non-White Women                            | 74       | 88.09  |
| Other Women                                | 1        | 100.00 |

Table 4 Continued

| Characteristic            | <i>n</i> | %     |
|---------------------------|----------|-------|
| Total                     | 233      | 80.90 |
| ACT Below 20              | 103      | 69.10 |
| ACT Above 20              | 431      | 80.60 |
| Total                     | 534      | 78.07 |
| HS GPA Below 2.75         | 96       | 65.30 |
| HS GPA Above 2.75         | 456      | 81.90 |
| Total                     | 552      | 78.40 |
| <u>General Student: 1</u> |          |       |
| White Men                 | 5,381    | 51.04 |
| Non-White Men             | 736      | 42.59 |
| Other Men                 | 32       | 58.18 |
| Total                     | 6,148    | 49.90 |
| White Women               | 6,141    | 55.74 |
| Non-White Women           | 1,160    | 50.17 |
| Other Women               | 42       | 54.54 |
| Total                     | 7,343    | 54.80 |
| ACT Below 20              | 2,467    | 45.60 |
| ACT Above 20              | 8,669    | 55.40 |
| Total                     | 11,136   | 52.92 |
| HS GPA Below 2.75         | 1,991    | 36.51 |
| HS GPA Above 2.75         | 9,955    | 57.30 |
| Total                     | 11,946   | 52.34 |

### Chi-Square and Rate Ratio Analysis

Chi-square and rate ratio analyses were calculated to measure association and differences between students with access to five, three, and one academic support services and the likelihood of graduation events in each group. Results of these analyses are depicted in Table 5. The results indicated that the distribution of graduation events between students with access to five academic support services was different than students

with access to three academic support services and one academic support service (*Chi square* = 17.96, *df* = 1, *p* < .001). The results indicated that the distribution of graduation events between students with access to three academic support services was different than students with access to five academic support services and students with access to one academic support service (*Chi square* = 187.089, *df* = 1, *p* < .001). The results indicated that the distribution of graduation events between students with access to one academic support service was different than students with access to three and five academic support services (*Chi square* = 156.78, *df* = 1, *p* < .001).

As the results indicated there were significant differences among all three groups in the distribution of graduation events, rate ratios were calculated to determine the likelihood of graduation events among each group. The results indicated that students with access to five academic support services are more likely to have a graduation event than students with access to one and three academic support services (*OR* = 1.38, *CI* = 1.18 to 1.60, *p* < .001). The results indicated that students with access to three academic support services are more likely to have a graduation event than students with access to one and five academic support services (*OR* = 3.26, *CI* = 2.72 to 3.90). The results indicated that students with access to one academic support service are less likely to have a graduation event than students with access to three and five academic support services (*OR* = .488, *CI* = .435 to .547, *p* < .001).

Table 5.

*Chi-Squares and Rate Ratios for Access to Academic Support Services and Graduation Percentage (N =27, 176)*

| Characteristic                             | <i>n</i><br><i>graduated</i> | <i>N</i><br><i>participants</i> | <i>% of graduates</i> | <i>Odds of</i><br><i>graduating</i> | <i>95% Confidence Interval</i> |              |
|--|------------------------------|---------------------------------|-----------------------|-------------------------------------|--------------------------------|--------------|
|  |                              |                                 |                       |                                     | <i>Lower</i>                   | <i>Upper</i> |
| <b>Access to Academic Support Services</b> |                              |                                 |                       |                                     |                                |              |
| Student Athlete: 5                         | 452                          | 741                             | 60.99                 | 1.38                                | 1.18                           | 1.60         |
| Non-Student Athlete: 1/3 (reference)       |                              |                                 |                       |                                     |                                |              |
| Greek: 3                                   | 566                          | 722                             | 78.39                 | 3.26                                | 2.72                           | 3.90         |
| Non-Greek: 1/5 (reference)                 |                              |                                 |                       |                                     |                                |              |
| General Student: 1                         | 13,492                       | 25,729                          | 52.43                 | .488                                | .435                           | .547         |
| Student Athlete or Greek: 3/5 (reference)  |                              |                                 |                       |                                     |                                |              |
| Total                                      | 14,510                       | 27, 176                         | 53.39                 |                                     |                                |              |

*Note* : Chi-Square=17.96, *df* = 1, (*p* < .001) for Student Athletes Compared to Non-Student Athletes

Chi-Square = 187.089, *df* = 1, (*p* < .001) for Greeks Compared to Non-Greeks

Chi-Square = 156.78, *df* = 1, (*p* < .001) for General Students Compared to Non-General Students

## Survival Analysis

Results of the survival analysis life table for access to academic support services subgroups, graduation frequency, and graduation percentage for 120-200 credit hours attempted are depicted in Table 6. The results indicated that 86 percent of students with access to five academic support services (student athletes) had a graduation event prior to attempting 170 credit hours. 83 percent of students with access to three academic support services (Greeks) had a graduation event prior to attempting 170 credit hours. 80 percent of students with access to one academic support service (General students) had a graduation event prior to attempting 170 credit hours.



Table 6.

*Graduation Time Characteristics of Participant Credit Hours Attempted to Graduate Between 120 and 200 Credit Hours and Access to Academic Support Services, (N = 27,176)*

| Characteristic                            | <i>n</i>   | %             |
|---|------------|---------------|
| <b>Credit Hours Attempted to Graduate</b> |            |               |
| <b>Student Athlete: 5</b>                 |            |               |
| 120-129                                   | 70         | 15.48         |
| 130-139                                   | 92         | 20.34         |
| 140-149                                   | 88         | 19.46         |
| 150-159                                   | 86         | 19.26         |
| 160-169                                   | 51         | 11.28         |
| 170-179                                   | 25         | 5.53          |
| 180-189                                   | 16         | 3.53          |
| 190-200                                   | 24         | 5.30          |
| <b>Total</b>                              | <b>452</b> | <b>100.00</b> |
| <b>Greek: 3</b>                           |            |               |
| 120-129                                   | 117        | 20.67         |
| 130-139                                   | 111        | 19.61         |
| 140-149                                   | 92         | 16.25         |
| 150-159                                   | 81         | 14.31         |
| 160-169                                   | 67         | 11.84         |
| 170-179                                   | 39         | 6.89          |
| 180-189                                   | 21         | 3.71          |
| 190-200                                   | 38         | 6.72          |

Table 6. Continued

| Characteristic     | <i>n</i> | %      |
|--------------------|----------|--------|
| Total              | 566      | 100.00 |
| General Student: 1 |          |        |
| 120-129            | 2,265    | 16.80  |
| 130-139            | 2,754    | 20.43  |
| 140-149            | 2,413    | 17.91  |
| 150-159            | 1,930    | 14.31  |
| 160-169            | 1,439    | 10.68  |
| 170-179            | 979      | 7.26   |
| 180-189            | 617      | 4.58   |
| 190-200            | 1,083    | 8.03   |
| Total              | 13,480   | 100.00 |

Figure 1 shows the survival function for graduation as it changes with the number of credit hours attempted for students with access to five academic support services (student athletes) and students with access to one and three academic support services (non-student athletes). As the results indicate, there is very little difference between the two groups until 150 credit hours attempted when the survival function for student athletes drops from .50 to .30 and only drops from .50 to .40 for non-student athletes. Moreover, from 170 credit hours attempted the survival function drops from .30 to .10 for student athletes and only drops from .35 to .25 for non-student athletes.

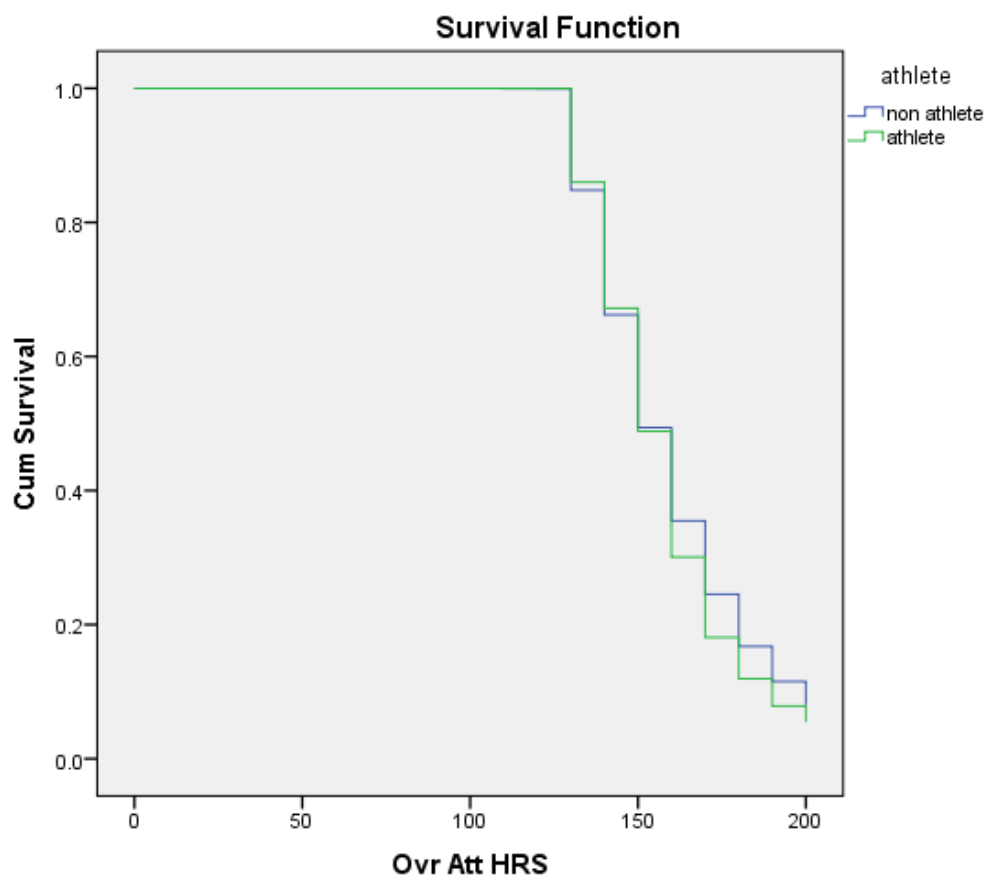


Figure 1. Cumulative survival of graduation events and credit hours attempted between student athletes and non-student athletes

Figure 2 shows the survival function for graduation as it changes with the number of credit hours attempted for students with access to three academic support services (Greeks) and students with access to one and five academic support services (non-Greeks). As the results indicate, there is a difference between the two groups from 120 to 130 credit hours attempted when the survival function for Greeks drops from 1.0 to .80 and only drops from 1.0 to approximately to .85 for non-Greeks. However, the groups are constant until 175 hours when the survival for Greeks drops from approximately .30 to .18 and only drops from .35 to .25 for non-Greeks

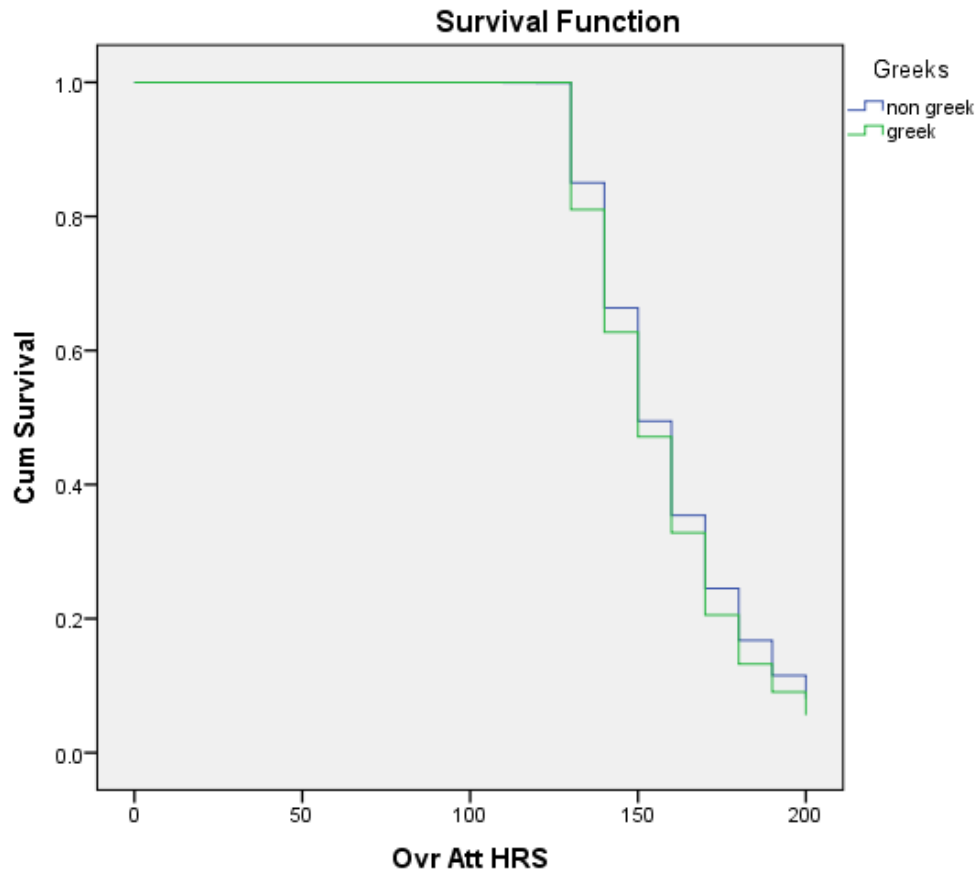


Figure 2. Cumulative survival of graduation events and credit hours attempted between Greek students and non-Greek students

Figure 3 shows the survival function for graduation as it changes with the number of credit hours attempted for students with access to one academic support service (general student) and students with access to three or five academic support services. As the results indicate there is a difference between the two groups from 160 to 170 credit hours attempted when the survival function for student athletes and Greeks drops from approximately .48 to 3.0 and only drops from approximately .50 to 3.8 for general students.

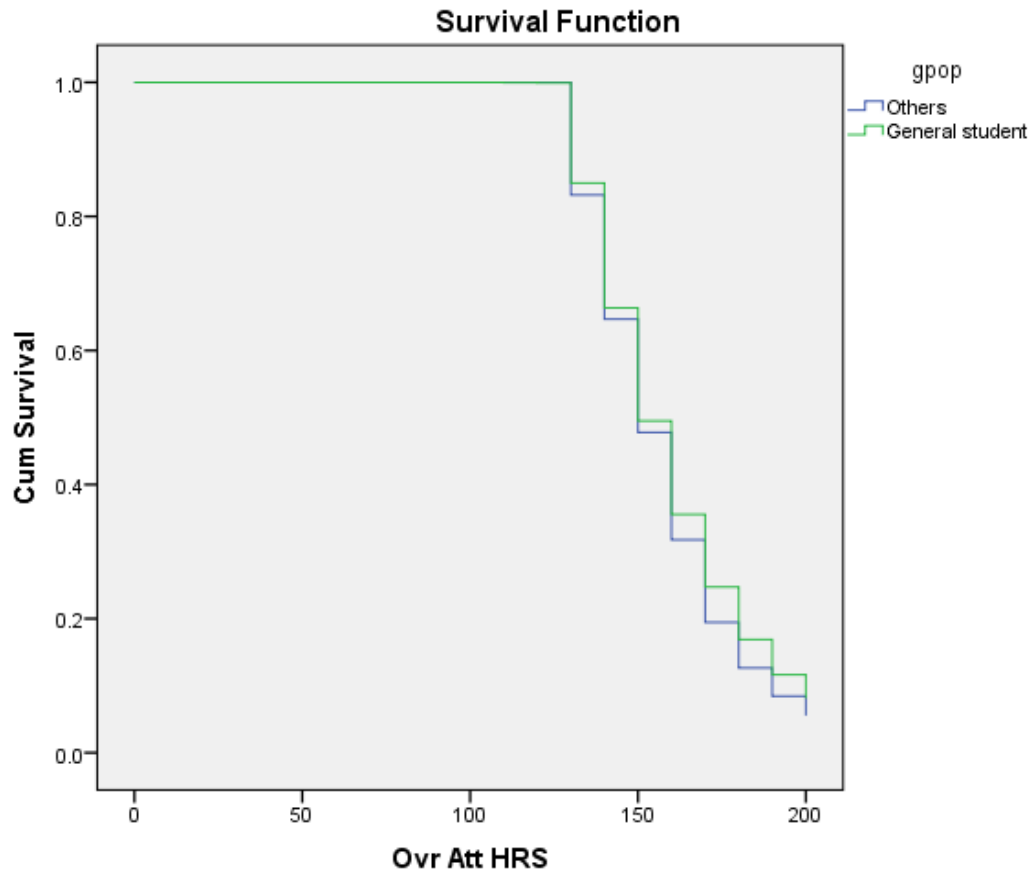


Figure 3. Cumulative survival of graduation events and credit hours attempted between general students and student athletes and Greek students

### Cox Regression Analysis

As the data generated by the life table give a general approximation of graduation events comparing students with different access to academic support services over an attempted credit hour timeframe, results from the Cox regression models produce an odds ratio that identifies the likelihood of the graduation event occurring and if the event will increase or decrease over time. Table 7 depicts the Cox regression interaction model predicting time of graduation and access to five academic support services. The model produced a significant main effect for student athlete and significant interactions between gender and access to five academic support services, race and access to five academic

support services, and high school GPA and access to academic support services. ACT score was not found to be a significant predictor of graduation events over time for student with access to five academic support services (*Chi square* = 380.47, *df* = 5, *p* < .001, *-2 log likelihood* = 221334.580).

Table 7.

*Cox Regression Analysis Predicting Time of Graduation and Access to Five Academic Support Services (N =741)*

| Variable   | B     | SE   | Odds ratio |       | Wald statistic | p      |       |
|--|-------|------|------------|-------|----------------|--------|-------|
|  |       |      | Lower      | Upper |                |        |       |
| Main Effects:  |       |      |            |       |                |        |       |
| Student Athletes: 5<br>Non Student Athletes: 1-3 (reference) | -.182 | .067 | .834       | .731  | .951           | 7.28   | .007  |
| Interactions:  |       |      |            |       |                |        |       |
| Student Athlete: 5*Race                                      | .163  | .044 | 1.17       | 1.07  | 1.28           | 13.60  | <.001 |
| Student Athlete: 5*Gender                                    | -.038 | .009 | .963       | .946  | .981           | 16.90  | <.001 |
| Student Athlete: 5*HS GPA                                    | -.359 | .024 | .699       | .666  | .733           | 215.29 | <.001 |

Note: Model Chi-Square =380.47, *df* = 5, (*p* < .001); -2 Log Likelihood = 221334.580

To control for the first significant interaction, race and access to five academic support services, the investigator split the file for race and performed another Cox regression for each category of race. The results are shown in Table 8 and indicated that when controlling for race, white students with access to five academic support services are more likely to have a decrease in graduation events than white students with access to one and three academic support services as the number of attempted credit hours increase (*OR* =1.20, *CI* = 1.07 to 1.35, *p* = .002).

Table 8.

*Cox Regression Analysis Predicting Time of Graduation and Access to Five Academic Support Services  
Among White and Non-White Students (N =741)*

| Variable                              | B     | SE  | Odds ratio | 95% Confidence Interval |       | Wald statistic | p    |
|---------------------------------------|-------|-----|------------|-------------------------|-------|----------------|------|
|                                       |       |     |            | Lower                   | Upper |                |      |
| Main Effects:                         |       |     |            |                         |       |                |      |
| Non Student Athletes: 1-3 (reference) |       |     |            |                         |       |                |      |
| White Student Athletes: 5             | -188  | .06 | 1.20       | 1.07                    | 1.35  | 9.94           | .002 |
| Non-White Student Athletes: 5         | -.137 | .08 | 1.14       | .976                    | 1.34  | 2.79           | .095 |

*Note:* Model Chi-Square = 9.975, *df* = 1, (*p* = .002); -2 Log Likelihood = 209662.241 for White Students  
Model Chi-Square = 2.794, *df* = 1, (*p* = .095); -2 Log Likelihood = 29989.863 for Non-White Students

To control for the second significant interaction, gender and access to five academic support services, the investigator split the file for gender and performed another Cox regression for each category of gender. The results are shown in Table 9 and indicated that when controlling for gender, women with access to five academic support services are more likely to have a decrease in graduation events than women with access to one and three academic support services as the number of attempted credit hours increase (*OR* = 1.34, *CI* = 1.15 to 1.57, *p* < .001).

Table 9.

*Cox Regression Analysis Predicting Time of Graduation and Access to Five Academic Support Services  
Among Men and Women (N =741)*

| Variable                              | B     | SE  | Odds ratio | 95% Confidence Interval |       | Wald statistic | p     |
|---------------------------------------|-------|-----|------------|-------------------------|-------|----------------|-------|
|                                       |       |     |            | Lower                   | Upper |                |       |
| Main Effects:                         |       |     |            |                         |       |                |       |
| Non Student Athletes: 1-3 (reference) |       |     |            |                         |       |                |       |
| Male Student Athletes: 5              | -.048 | .06 | 1.05       | .934                    | 1.18  | .650           | .420  |
| Female Student Athletes: 5            | -.298 | .08 | 1.34       | 1.15                    | 1.57  | 13.65          | <.001 |

Note: Model Chi-Square =.651,  $df = 1$ , ( $p = .423$ ); -2 Log Likelihood =108182.306 for Men

Model Chi-Square =13.76,  $df = 1$ , ( $p < .001$ ); -2 Log Likelihood =125238.614 for Women

To control for the third significant interaction, high school GPA and access to five academic support services, the investigator split the file for high school GPA and performed another Cox regression for each category of high school GPA. The results are shown in Table 10 and indicated that when controlling for high school GPA, students with a high school GPA above 2.75 and access to five academic support services are less likely to have a decrease in graduation events than students with a high school GPA above 2.75 and with access to one and three academic support services as the number of attempted credit hours increase ( $OR = .812$ ,  $CI = .723$  to  $.912$ ,  $p < .001$ ).



Table 10.

*Cox Regression Analysis Predicting Time of Graduation and Access to Five Academic Support Services and High School GPA (N =741)*

| Variable                              | B     | SE   | Odds ratio | 95% Confidence Interval |       | Wald statistic | p     |
|---------------------------------------|-------|------|------------|-------------------------|-------|----------------|-------|
|                                       |       |      |            | Lower                   | Upper |                |       |
| Main Effects:                         |       |      |            |                         |       |                |       |
| Non Student Athletes: 1-3 (reference) |       |      |            |                         |       |                |       |
| HS GPA Below 2.75 Student Athletes: 5 | -.076 | .104 | .927       | .775                    | 1.13  | .525           | .469  |
| HS GPA Above 2.75 Student Athletes: 5 | -.208 | .059 | .812       | .723                    | .912  | 12.26          | <.001 |

Note: Model Chi-Square = .525,  $df = 1$ , ( $p = .469$ ); -2 Log Likelihood =29986.887 for HS GPA Below 2.75  
Model Chi-Square = 12.30,  $df = 1$ , ( $p <.001$ ); -2 Log Likelihood =179953.555 for HS GPA Above 2.75

As the results of the Cox regression model for predicting time of graduation and access to five academic support services indicate, when controlling for race, gender, and ACT score, students with access to five academic support services are more likely to have a decrease in graduation events than students with access to one and three academic support services as the number of attempted credit hours increase. Therefore, students with access to five academic support services graduate more efficiently than students with access to one and five academic support services.

In addition to producing a hazard ratio and correlation coefficient, the Cox regression model also graphically depicts the difference in the graduation event hazard function between the reference group and group of interest over the time of attempted credit hours. These results are shown in Figure 4 and indicate that the hazard function increases for students with access to five academic support services at approximately 160 hours from approximately .10 to .25, while students with access to one and three academic support services reach .25 at approximately 200 credit hours attempted.

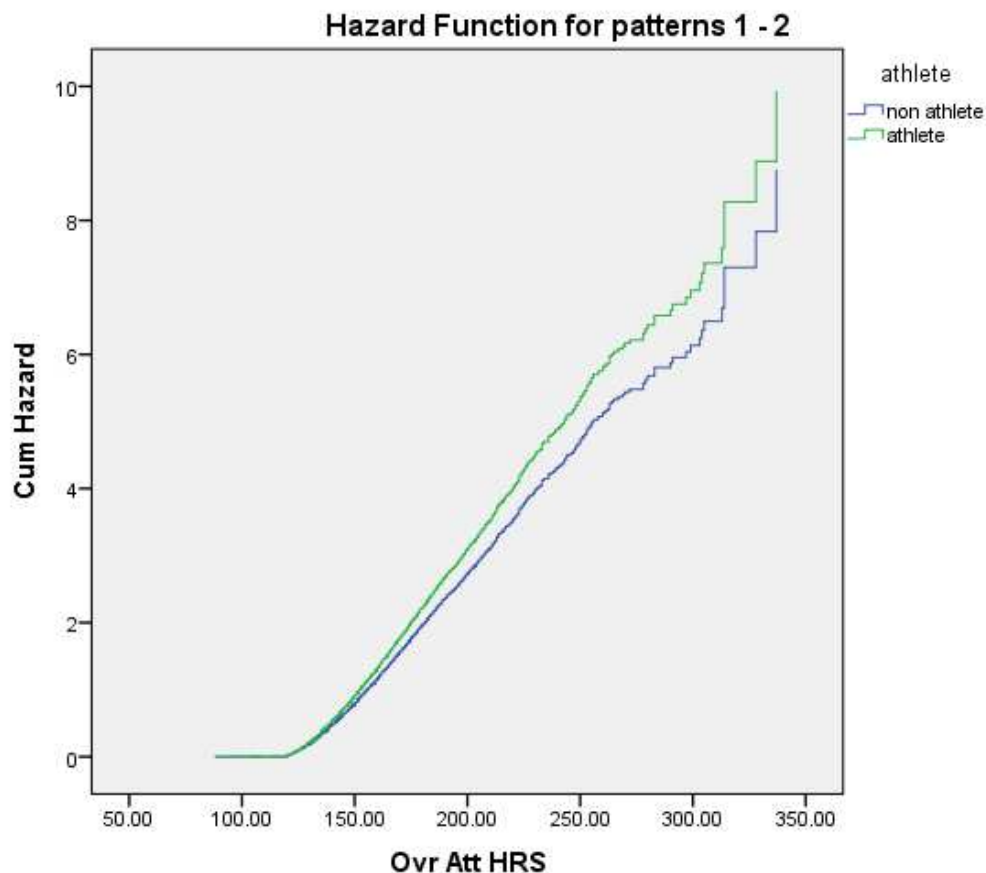


Figure 4. Cumulative hazard of graduation events and credit hours attempted between student athletes and non-student athletes

Table 11 depicts the Cox regression interaction model predicting time of graduation and access to three academic support services. The model produced significant main effects, Greeks and high school GPA and graduation events, and interactions between race and access to three academic support services, and gender and access to three academic support services. ACT score was not found to be a significant predictor of graduation events over time for students with access to three academic support services ( $Chi\ square = 386.43$ ,  $df = 5$ ,  $p < .001$ ,  $-2\ log\ likelihood = 221742.027$ ).

Table 11.

*Cox Regression Analysis Predicting Time of Graduation and Access to Three Academic Support Services (N =722)*

---

*95% Confidence Interval*

| Variable                                 | B     | SE   | Odds ratio | Lower | Upper | Wald statistic | p     |
|--|-------|------|------------|-------|-------|----------------|-------|
| <b>Main Effects:</b>                     |       |      |            |       |       |                |       |
| Greeks: 3<br>Non Greeks: 1/5 (reference) | -.172 | .061 | .842       | .746  | .949  | 7.99           | .005  |
| HS GPA<br>Below 2.75 (reference)         | -.361 | .024 | .697       | .665  | .731  | 226.50         | <.001 |
| <b>Interactions:</b>                     |       |      |            |       |       |                |       |
| Greeks: 3*Race                           | .154  | .044 | 1.16       | 1.07  | 1.27  | 12.43          | <.001 |
| Greeks: 3*Gender                         | -.035 | .009 | .966       | .949  | .983  | 14.35          | <.001 |

*Note:* Model Chi-Square =386.43, *df* = 5 (*p* < .001); -2 Log Likelihood = 221742.027

To control for the first significant interaction, race and access to three academic support services, the investigator split the file for race and performed another Cox regression for each category of race. The results are shown in Table 12 and indicated that when controlling for race, white students with access to three academic support services are less likely to have a decrease in graduation events than white students with access to one and five academic support services as the number of attempted credit hours increase (*OR* =.885, *CI* = .804 to .937, *p* = .012). The results also indicated that non-white students with access to three academic support services are less likely to have a decrease in graduation events than white students with access to one and five academic support services as the number of attempted credit hours increase (*OR* =.814, *CI* = .679 to .974, *p* = .025).

Table 12.

*Cox Regression Analysis Predicting Time of Graduation and Access to Three Academic Support Services  
Among White and Non-White Students (N =722)*

| Variable                    | B     | SE   | Odds ratio | 95% Confidence Interval |       | Wald statistic | p    |
|-----------------------------|-------|------|------------|-------------------------|-------|----------------|------|
|                             |       |      |            | Lower                   | Upper |                |      |
| Main Effects:               |       |      |            |                         |       |                |      |
| Non Greeks: 1/5 (reference) |       |      |            |                         |       |                |      |
| White Greeks: 3             | -.123 | .049 | .885       | .804                    | .937  | 6.35           | .012 |
| Non-White Greeks: 3         | -.206 | .092 | .814       | .679                    | .974  | 5.04           | .025 |

Note: Model Chi-Square = 6.36,  $df = 1$ , ( $p = .012$ ); -2 Log Likelihood =209665.498 for White Students  
Model Chi-Square =5.06,  $df = 1$ , ( $p = .024$ ); -2 Log Likelihood =29987.793 for Non-White Students

To control for the second significant interaction, gender and access to three academic support services, the investigator split the file for gender and performed another Cox regression for each category of gender. The results are shown in Table 13 and indicated that when controlling for gender, women with access to three academic support services are less likely to have a decrease in graduation events than women with access to one and three academic support services as the number of attempted credit hours increase ( $OR = .801$ ,  $CI = .703$  to  $.913$ ,  $p < .001$ ).

Table 13.

*Cox Regression Analysis Predicting Time of Graduation and Access to Three Academic Support Services  
Among Men and Women (N =722)*

| Variable                    | B     | SE   | Odds ratio | 95% Confidence Interval |       | Wald statistic | p     |
|-----------------------------|-------|------|------------|-------------------------|-------|----------------|-------|
|                             |       |      |            | Lower                   | Upper |                |       |
| Main Effects:               |       |      |            |                         |       |                |       |
| Non Greeks: 1/5 (reference) |       |      |            |                         |       |                |       |
| Male Greeks: 3              | -.082 | .056 | .921       | .825                    | 1.02  | 2.15           | .142  |
| Female Greeks: 3            | -.222 | .067 | .801       | .703                    | .913  | 11.07          | <.001 |

*Note:* Model Chi-Square = 2.51, *df* = 1, (*p* = .142); -2 Log Likelihood =108180.947 for Men  
Model Chi-Square =11.12, *df* = 1, (*p* = .001); -2 Log Likelihood =125251.058 for Women

As the results of the Cox regression model for predicting time of graduation and access to three academic support services indicate, when controlling for all other variables, students with access to three academic support services are less likely to have a decrease in graduation events than students with access to one and five academic support services as the number of attempted credit hours increase. Therefore, students with access to three academic support services graduate moderately less efficiently than students with access to one and five academic support services.

In addition to producing a hazard ratio and correlation coefficient, the Cox regression model also graphically depicts the difference in the graduation event hazard function between the reference group and group of interest over the time of attempted credit hours. These results are shown in Figure 5 and indicate that the hazard function doesn't deviate significantly for students with access to three academic support services from students with access to one and five academic support services until approximately 200 credit hours attempted and then only from approximately .28 to .26. The largest

significant increase in the hazard function occurs at 260 credit hours attempted where the difference is approximately .60 to .50.

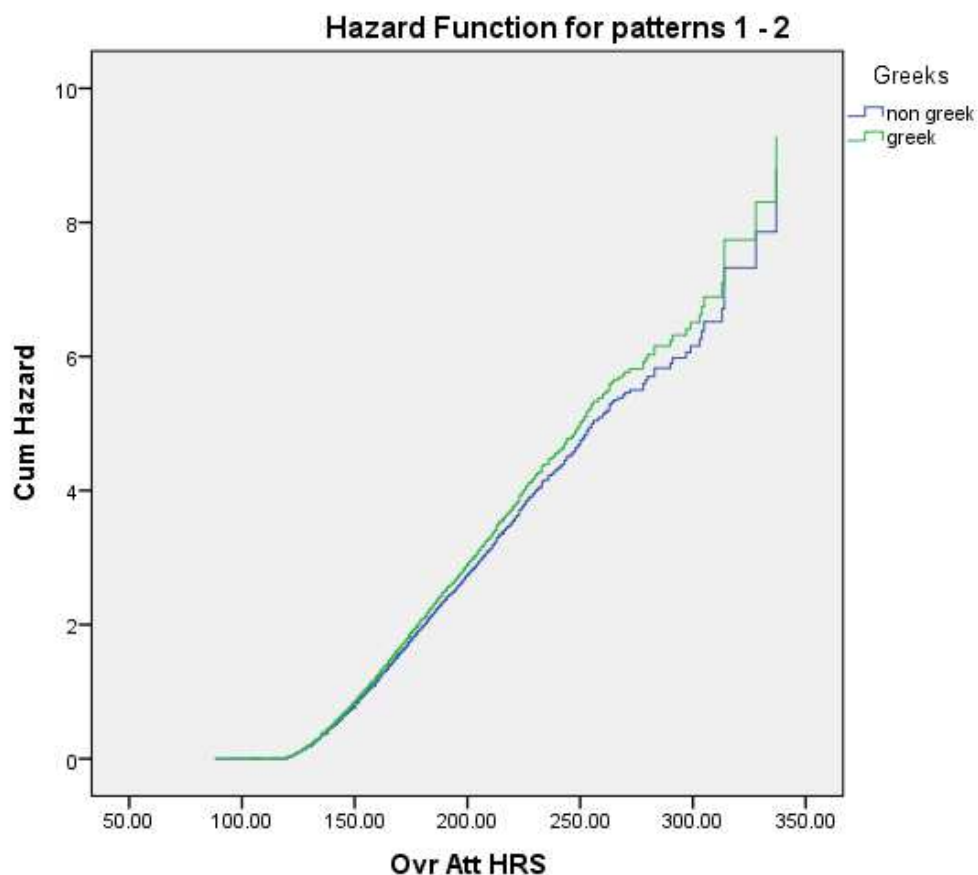


Figure 5. Cumulative hazard of graduation events and credit hours attempted between Greek students and non-Greek students

Table 14 depicts the Cox regression interaction model predicting time of graduation and access to one academic support service. The model produced significant main effects for general students, race, and high school GPA, and a significant interaction between gender and access to one academic support service. ACT score was not found to be a significant predictor of graduation events over time for student with access to one academic support service ( $Chi\ square = 406.106$ ,  $df = 5$ ,  $p < .001$ ,  $-2\ log\ likelihood = 221742.027$ ).

Table 14.

*Cox Regression Analysis Predicting Time of Graduation and Access to One Academic Support Service (N =25,729)*

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*95% Confidence Interval*

| Variable   | <i>B</i> | <i>SE</i> | <i>Odds ratio</i> | <i>Lower</i> | <i>Upper</i> | <i>Wald statistic</i> | <i>p</i> |
|--|----------|-----------|-------------------|--------------|--------------|-----------------------|----------|
| <b>Main Effects:</b>   |          |           |                   |              |              |                       |          |
| General Students: 1<br>Non General Students: 3-5 (reference) | .175     | .035      | 1.19              | 1.11         | 1.27         | 24.82                 | <.001    |
| Race<br>White (reference)                                    | .155     | .043      | 1.16              | 1.07         | 1.27         | 13.06                 | <.001    |
| HS GPA<br>Below 2.50 (reference)                             | -.373    | .024      | .689              | .658         | .722         | 247.75                | <.001    |
| <b>Interactions:</b>   |          |           |                   |              |              |                       |          |
| General Students: 1*Gender                                   | -.134    | .034      | .874              | .818         | .934         | 15.69                 | <.001    |

*Note: Model Chi-Square =406.106, df = 5, (p < .001); -2 Log Likelihood: 221742.027*

To control for the significant interaction, gender and access to one academic support service, the investigator split the file for gender and performed another Cox regression for each category of gender. The results are shown in Table 15 and indicated that when controlling for gender, female students with access to three academic support services are more likely to have an increase in graduation events than female students with access to three and five academic support services as the number of attempted credit hours increase ( $OR = 1.29$ ,  $CI = 1.17$  to  $1.43$ ,  $p < .001$ ).

Table 15.

*Cox Regression Analysis Predicting Time of Graduation and Access to One Academic Support Service  
Among Men and Women (N=25,729)*

| Variable                              | B    | SE   | Odds ratio |       | 95% Confidence Interval |       | Wald statistic | p |
|---------------------------------------|------|------|------------|-------|-------------------------|-------|----------------|---|
|                                       |      |      | Lower      | Upper | Lower                   | Upper |                |   |
| Main Effects:                         |      |      |            |       |                         |       |                |   |
| Non General Students: 3/5 (reference) |      |      |            |       |                         |       |                |   |
| Male General Students: 1              | .067 | .042 | 1.06       | .984  | 1.16                    | 2.47  | .116           |   |
| Female General Students: 1            | 2.60 | .052 | 1.29       | 1.17  | 1.43                    | 24.81 | <.001          |   |

Note: Model Chi-Square =2.47,  $df = 1$ , ( $p = .115$ ); -2 Log Likelihood = 108182.947 for Men

Model Chi-Square =24.951,  $df = 1$ , ( $p < .001$ ); -2 Log Likelihood =125251.058 for Women

As the results of the Cox regression model for predicting time of graduation and access to one academic support service indicate, when controlling for all other variables, students with access to one academic support services are more likely to have an increase in graduation events than students with access to three and five academic support services as the number of attempted credit hours increase. Therefore, students with access to one academic support services graduate less efficiently than students with access to three and five academic support services.

In addition to producing a hazard ratio and correlation coefficient, the Cox regression model also graphically depicts the difference in the graduation event hazard function between the reference group and group of interest over the time of attempted credit hours. These results are shown in Figure 6 and indicate that the hazard function deviates significantly for students with access to three and five academic support services and students with access to one academic support service at approximately 160 to 200



credit hours attempted. For students with access to three and five academic support services, the hazard function increases from .10 to .40 during this time frame. The hazard function for students with access to one academic support services only increases from .10 to approximately .22 during the same time frame.

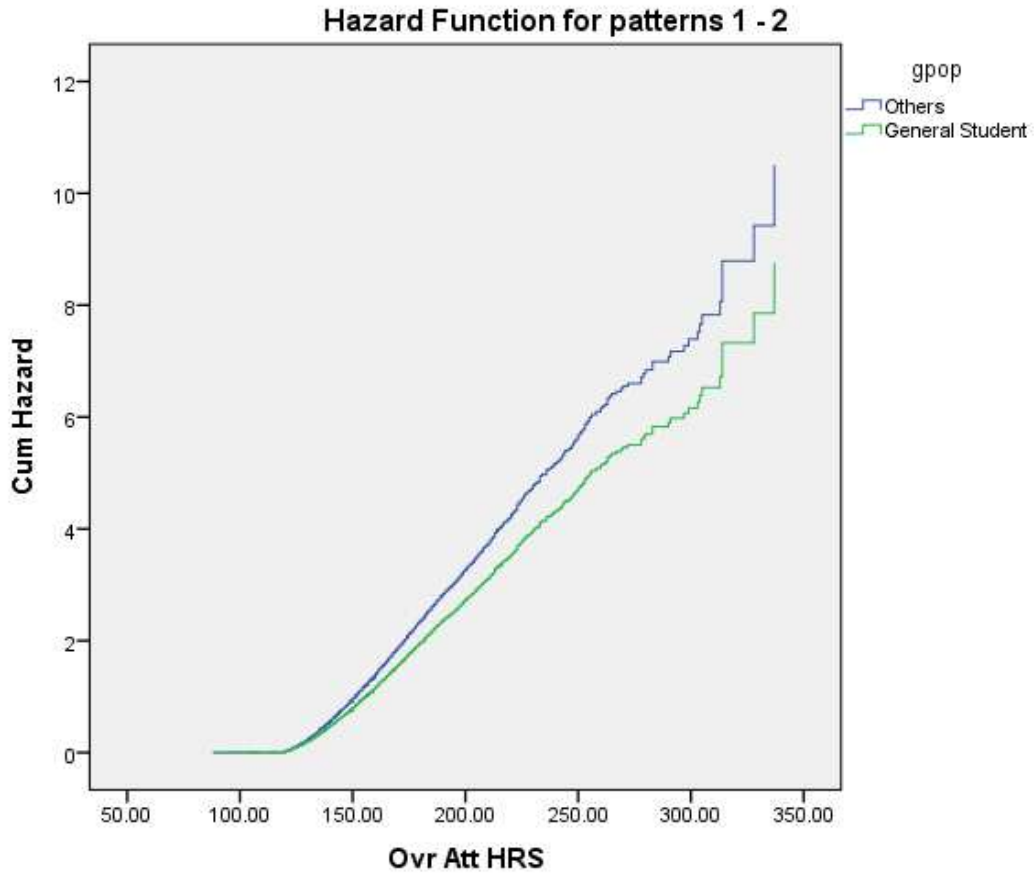


Figure 6. Cumulative hazard of graduation events and credit hours attempted between general students and student athletes and Greeks

## CHAPTER V.

### DISCUSSION

#### Research Question I.

What effect does the amount of access to academic support services have on the likelihood of student graduation?

From the conclusions referenced in the results section of this dissertation, the investigator was able to answer the first research question and accept the first research hypothesis. As the results of the Chi-square analysis and rate ratio analysis indicated, students with access to three and five academic support services had a significantly higher graduation rate and were more likely to have a graduation event than students with access to one academic support service. The one caveat to accepting the research hypothesis was that the investigator was able to accept: students with access to *more* academic support services were more likely to graduate, as both groups with access to more academic support services had higher graduation rates than the group with access to the fewest academic support services. However, the investigator could not accept: students with access to the *most* academic support services were more likely to graduate, as students with access to three academic support services had a higher graduation rate and were more likely to have a graduation event than students with access to five academic support services.

The underlying causes for the discrepancy between students with access to three academic support services and students with access to five academic support services may largely be due to a difference in demographics and academic preparedness prior to college

entry. For example, when making an inference between predictive college success metrics such as ACT score and high school GPA and success in college, the results in Table 2 indicate that students with access to three academic support services (Greeks) scored significantly higher on both ACT score and high school GPA than students with access to five academic support services (student athletes). The results also indicated that students with access to three academic support services had a significantly higher number of white and female students than students with access to five academic support services. By percentage nationally, women (60%) and white students (60%) graduate at a higher rate than men (54%) and non-white students (43%) (National Center for Educational Statistics, 2014).

Based on the demographic and college success entrance criteria, the student athlete population may be more likely to come from a lower economic area, have a lesser funded public education, and/or be a first generation student than the Greek or general student population (Lapchick, 2011; Branch, 2011). Moreover, Soria (2013) found that Greek students were more likely to come from multi-generational college graduate households, the upper middle and upper-class, and from wealthier backgrounds overall than non-Greek students. Astin (1993) and Stuber (2011) have found that students from multi-generational college graduate households and wealthy backgrounds are more likely to persist, succeed, and graduate than first-generation or low-income college students.

Although there may be underlying non-academic factors as to why these two groups differed in graduation rate, the results indicate a significant relationship between access to more academic services and an increased graduation rate, as opposed to access to fewer academic support services and a lower graduation rate for the general student

population. Therefore, the results of this study confirmed that students with less predicted college academic success (student athletes) graduated at a higher rate than students with more predicted academic success (general student population) as a result of access to more academic support services, under the assumption that both groups had equal access to other non-academic support related student services. Moreover, the results of this study confirmed that students with the highest predicted academic success (Greeks) graduated at the higher rate than students with slightly lower predicted academic success (general student population) as a result of being more academically prepared for college, increased social integration, and access to more academic support services, under the assumption that both groups had equal access to other non-academic support services.

### **Research Question II.**

What effect does the amount of access to academic support services have on the efficiency of student graduation as determined by credit hours attempted for degree completion.

From the conclusions referenced in the results section of this dissertation, the investigator was able to answer the second research question and accept the second research hypothesis. As the results of the survival analyses and Cox regression analyses indicated, students with access to five academic support services were more likely to have a decrease in graduation events than students with access to one and three academic support services as the number of credit hours increase over time. Therefore, students with access to five academic support services graduate more efficiently than students with access to one and three academic support services. The results also indicated that students

with access to three academic support services were less likely to have a decrease in graduation events than students with access to one and five academic support services. Therefore, they graduated less efficiently than student athletes in particular. Lastly, the results indicated that students with access to one academic service were more likely to have an increase in graduation events than students with access to three and five academic support services. Therefore, they graduate less efficiently than student athletes and Greeks.

As mentioned previously, there may be several non-academic factors that influence why student athletes graduate more efficiently than Greeks and the general student population. Student athletes may be required to make faster degree progress in order to meet NCAA continuing eligibility requirements or may be more goal oriented and aggressive in their pursuit of graduation (Loughran & Etzel, 2010). However, the literature indicates that students who complete their degree in a timely fashion are more likely to graduate and persist than students who take longer to complete their degrees (Shulock & Koester, 2014; The Institute for Higher Education Leadership and Policy 2009; Ramist, 1981; Pantages & Creedon, 1978). Therefore, the academic support services that are available to assist students in meeting their eligibility and degree requirements may have a direct effect on graduation success due to the increased efficiency of requirement completion. On the other hand, Greeks may intentionally persist longer due to their bond with the social network Greek life provides (Astin, 1993; Pascarella & Terenzini, 2005), or have more financial resources to double major or study abroad than the other groups (Soria, 2012).

However, for the purpose of this study, the assumption was that all groups had equal access to non-academic support services and therefore, it was determined that access to academic support services for the primary differentiating *academic* factor between all three groups that were examined. Therefore, the results of this study demonstrate strong support for future research investigating integrated academic support models for increased academic performance and graduation among undergraduate students. Moreover, the results of this study also provide compelling evidence for colleges and universities to include an integrated academic support services model as part of their academic performance and retention initiatives.

### **Conclusions and Recommendations**

Based on the increased emphasis on retention, graduation, and implementation of student support services, the purpose of this study was to investigate if academic support based retention measures had an effect on student graduation and to examine if current academic support models positively influence academic performance in those populations that have access to them. As mentioned in the review of literature, much of the research in student persistence and retention indicates engagement of the student to the university and the institution's ability to provide engagement opportunities correlate strongly with the student's success and persistence. As such, the results of this study allowed the investigator to compare Tinto's (1975) model of attrition and persistence, which is based upon the assumption that social and institutional integration is the most effective predictor for persistence and academic success (Tinto, 2007), and a number of other models which assume that academic integration alone as the most effective predictor of persistence and

academic success (DeBard, 1987; Penn-Edwards & Donnison, 2011; Pascarella & Terenzini, 1991; Troiano, Liefeld, & Trachtenberg, 2010; Ryan, 2004).

The results of this study lend themselves to supporting both models depending on the population of students. First, they appear to align themselves more with Tinto's model of attrition and persistence as a more effective predictor of increased academic performance in Greek students as they were most likely to graduate, had the highest social interaction, and had access to the second most amount of academic support services. Therefore, the investigator concluded that for the Greek population the combination of high social interaction and moderate academic interaction is a salient method for academic success and persistence in this population of students.

Secondly, students with access to five academic support services (student athletes) were also more likely to graduate than the general student population and graduated more efficiently than Greek students and students in the general population. As the literature indicates, student athletes have significantly lower integration socially or with the institution than students with access to three academic support services (Greeks) and students with access to one academic support service (general population) (Jolly, 2008; Parham, 1993; Chartrand & Lent, 1987; Debolt, Marcum, & Kennedy, 2011). Moreover, student athletes had significantly lower predictive academic success metrics than Greeks and the general student body. Therefore, the investigator concluded that increased academic integration had more of a significant effect on increased academic performance and graduation events than social or institutional integration for this population.

Lastly, as the general student population was the group least likely to have a graduation event and graduated less efficiently than the other groups, they also had

moderate social and institutional integration and low academic integration. Therefore, the investigator concluded that the lack of academic integration and to a lesser degree, institutional and social integration, directly contributed to a decrease in academic performance and graduation events among students in this population.

### **Future Research Applications**

Although the results of this study were significant and compelling, they should also be viewed with caution. As the design of the study was quasi-experimental, these results cannot prove causation. However, the primary merit of this study and the corresponding results, lies in the novel methodological approach taken to examine traditional undergraduate student academic performance, retention, and graduation rates. Traditional methods of examining these data have often included a simple proportion of graduated or retained, divided by the number of students in the population. This method lends itself to a two-dimensional percentage that doesn't truly take into account the actual time (other than 6 years) it takes a student to matriculate through their program of study, and countless other confounding variables that may predict student success or failure. Therefore, the results of this study indicate that applying this unique methodology to examining student graduation, lends itself to providing a three-dimensional view of student success or failure.

While several control variables were introduced during data analysis, there may also be several other variables (e.g., type of degree awarded) that may be introduced to provide more (or less) compelling evidence for implementing an integrated academic support program to increase student success. In addition, other student groups, organizations, or subpopulations such as veterans and first-generation student programs



(Student Success Services) may also be examined under this construct to determine the efficacy of the resources provided for them.

As the investigator was able to successfully establish that access to academic support services is significant predictor of academic performance and graduation rates in this study, future research to examine the utilization of these academic support services is recommended in order to determine if: 1) they only work effectively when used together, 2) one type of service is more predictive of academic success than another, or 3) utilization of any and all services is, or is not, predictive of academic success as measured by graduation. Future methodology for this research may include additional survival analysis studies to determine if the likelihood of graduation efficiency changes when examining utilization rather than access as well as other control variables and subpopulations as mentioned previously. In addition, an analysis of the five types of academic support services and student utilization would be recommended to determine if the types of academic support services and their utilization are related and which are more associated with academic success.

### **Future Practical Applications**

The primary limitation for this study was the data were only collected from one institution and therefore, generalizability to other peer institutions may prove difficult. However, the investigator was able to locate the four-class graduation rates (2009-13) for student athletes and the general student population at the five other Tennessee Board of Regents (TBR) institutions from a public database (NCAA, 2015). The investigator was able to compare the graduation percentages between these two groups at the peer institutions to determine if it was similar or differed from the population examined in this

study. Results indicated that the graduation percentage between student athletes and the general student population was similar between all of the peer institutions and the population at Middle Tennessee State University.

At Austin Peay State University, the graduation percentage for student athletes (58%) was greater than the general student population (34%). At the University of Memphis, the graduation percentage for student athletes (57%) was greater than the general student population (38%). At Tennessee Technological University, the graduation percentage for student athletes (62%) was greater than the general student population (51%). At Tennessee State University, the graduation percentage for student athletes (48%) was greater than the general student population (35%). Lastly, at East Tennessee State University the graduation percentage for student athletes (53%) was greater than the general student population (42%). Moreover, Greek students at Tennessee Technological University, a peer TBR institution, were reported to graduate at a higher percentage (68%) than student athletes (62%), and the general student population (51%) for the 2013-2014 graduation year (Tennessee Technological University, 2014), so it would appear that the results from the Greek population at MTSU may be generalizable to other peer TBR institutions as well.

In addition to sharing the same governance under TBR, these peer institutions are also all NCAA membership institutions and therefore, required to provide academic support services to their student athletes per the NCAA manual (NCAA, 2014). As the results of this study and peer group comparisons indicate, perhaps the same NCAA mandated academic support at each institution has also had a positive effect on increasing student academic performance, graduation rate, and graduation efficiency, especially in at-

risk groups such as first generation college students, low-income households, and even groups with low social interaction at TBR institutions in the state of Tennessee.

To a large extent, these results are of particular import for students in the general population. For Tennessee residents, students may be eligible for the Tennessee Lottery Hope Scholarship which will pay a student's tuition for their entire undergraduate degree. The caveat to this scholarship, however, is that they must maintain continuous full-time enrollment each semester, maintain a cumulative GPA of 2.75 up to 48 hours, a 3.0 for 49 hours and beyond, and graduate within five years. Moreover, the scholarship will only pay for 120 attempted credit hours even if students meet all of the above criteria (Middle Tennessee State University, 2015). Therefore, if students in the general population in particular are not graduating efficiently, they may not persist beyond this limit due to an increased financial burden. As the results of this study indicate, students that have access to more academic support services are more likely to graduate more efficiently and therefore, closer to the 120 credit hour threshold.

As mentioned previously, results of this study indicate that students with more academic support are more likely to graduate and do so more efficiently. Therefore, future practical applications of this research should include some of the findings from research studies by Shulock and Koester (2014), Crisp and Cruz (2009), Kersaint et al (2011), and The Institute for Higher Education Leadership and Policy (2009) where 1) Intrusive advising not only is a strong predictor for time towards degree and graduation success, but also has a large impact on the target audience. 2) Academic advisors with access to updated student progress and course information are more likely to advise students more effectively towards academic success and graduation. 3) Students that used tutorial and

other academic support services were more likely to be enrolled continuously and have fewer dropped or failed courses. 4) Peer mentoring and academic integration are directly related to increased academic performance and increased graduation rates.

In addition to the previously mentioned academic support services, guided study hall and mandatory participation in academic support services were also examined in this study and may have a significant effect on student academic success, especially in an at-risk population. However, implementation of these services may prove to be more difficult for a large population due to logistic and/or financial constraints. Nevertheless, some practical and cost-effective strategies for a simulated guided study hall may include: supplemental instruction and integrated classroom techniques such as Problem-Based Learning (PBL) where faculty and/or graduate assistants are available to guide students through the coursework in a strategic and organized manner.

Mandatory participation in academic support services may be even more difficult for college and university administrators to implement for general students as they do not have the same extrinsic rewards or punishments available as athletics or Greek life administrators do (e.g., control over playing time, scholarships, group membership, participation in social activities). However, linking participation in academic support services to course grading (e.g., must attend two tutoring sessions per week to earn full participation credit for the course) may have a positive effect on student utilization of academic support services and eventually lead to voluntary participation (i.e., self-regulation) in the future.

As legislation such as the Compete College of Tennessee Act begins to hold institutions of higher education accountable for the academic success of their students as

measured by retention and graduation rates, college and universities must make a significant paradigm shift from a reactive to a proactive approach to student academic support and success. As illustrated in this study, due to strong legislation and reform, athletic and Greek life departments were forced to make a similar shift in philosophy and strategy over ten years ago, and the results demonstrate that their efforts have produced a positive outcome with regards to student success as measured by graduation. Therefore, it is the primary recommendation of the investigator that university administrators consider an integrated student academic support program where the aforementioned services are made available *to the entire student population*. Although the results of this study could not prove causation, there may be enough compelling evidence to encourage institutions of higher education to examine this paradigm more closely when designing academic success and retention plans to increase academic success, retention, and graduation rates among their entire undergraduate student population.

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