

THREE NON-COGNITIVE FACTORS THAT INFLUENCE THE PERSISTENCE OF
STUDENT-ATHLETES: MOTIVATION, ENGAGEMENT, AND GRIT

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Three Non-Cognitive Factors Influencing Persistence of Student-Athletes:
Motivation, Engagement, and Grit

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ABSTRACT

Pressure to enroll and support students who will persist to graduation has become increasingly intense. Traditional measures such as ACT and GPA do not tell a complete story; consequently, significant interest in non-cognitive factors that contribute to success has evolved. More needs to be done however, to study unique populations of students whose circumstances differ from the general student. One such population are student-athletes who face competing demands for their time and talent, thus requiring certain non-cognitive characteristics that differ from general students.

Therefore, the purpose of this study was to examine non-cognitive factors that impact persistence of student-athletes at a private, Midwestern university. Using a path model, the relationship between three motivational subscales, engagement, grit and persistence were examined, and whether these factors varied by race, gender or sport.

Three instruments included in this study were the SAMSAQ, the IIR-S, and the Grit-S scale. Results revealed that the grit scale did not achieve internal consistency; therefore, analysis of this data was not discussed. The remaining factors revealed that Academic Motivation, Student-Athletic Motivation, and Engagement did not predict Persistence, but that Academic Motivation ($\beta = .33, p < .001$) and Student-Athletic Motivation ($\beta = .31, p < .001$) predicted Engagement. Career-Athletic Motivation revealed a significant negative relationship to Persistence ($\beta = -.19, p < .001$).

Eliminating all non-significant paths, step-wise analysis revealed that Engagement predicted Persistence ($\beta = .15, p < .05$) and mediated a significant indirect relationship between Academic ($\beta = .05, p < .05$) and Student-Athletic Motivation ($\beta = .05, p < .05$) and Persistence.

These results suggest that student-athletes with academic interests are more likely to engage in educationally purposeful activities that contribute to persistence, but as student-athletes become more interested in career athletics, their likelihood of persisting in a timely manner decreases. Results also revealed significant differences in Motivation and Persistence by gender, race and sport. Male and non-white student-athletes had higher Student-Athletic and Career Athletic Motivation scores and demonstrated a significant difference in their Persistence scores suggesting that student-athletes who are more interested in achieving success athletically may not persist on time, if at all.

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TABLE OF CONTENTS

ABSTRACT	iii
ACKNOWLEDGEMENTS	v
LIST OF TABLES	x
LIST OF FIGURES	xi
CHAPTER 1. INTRODUCTION	1
Non-Cognitive Factors that Impact Student Persistence	6
Student Motivation	7
Student Engagement	7
Student Grit	8
Intercollegiate Student-Athletes	8
Statement of the Problem	11
Purpose of Study	11
Research Questions	12
Significance of the Study	12
Definition of Terms	13
Delimitations of this Study	14
CHAPTER 2. LITERATURE REVIEW	15
The Significance of Degree Completion	17
Persistence and Student Success	20
Cognitive Factors and Student Persistence	20
Demographic Factors and Student Persistence	21
Non-Cognitive Factors and Student Persistence	22
Student-Athletes	34
Persistence and Success for Student-Athletes	37

Cognitive Factors and Student-Athlete Persistence	38
Demographic Factors and Student-Athlete Persistence	39
Non-Cognitive Factors and Student-Athlete Persistence	41
Summary	55
CHAPTER 3. METHODS	56
Research Design	56
Sampling Frame	57
Academic Measures.....	59
Instrumentation.....	59
The SAMSAQ.....	59
The Institutional Integration Scale-Revised	61
Grit Scale.....	63
Demographics and Persistence Factor.....	65
Procedures	66
Data Analysis	67
CHAPTER 4. RESULTS	69
Preliminary Data Analysis	69
Relationship among Motivation, Engagement, Grit and Persistence.....	70
Model Modification.....	74
Summary of Results for Research Question One	77
Differences in Motivation, Engagement and Persistence by Race, Gender and Sport	78
Gender	78
Race	79
Type of Sport.....	80
Summary of Results for Research Question Two	82

CHAPTER 5. DISCUSSION.....	83
The Relationship among Motivation, Engagement, Grit and Persistence.....	84
Differences in Motivation, Engagement, and Persistence by Race, Gender, Sport	87
Limitations	89
Implications for Theory.....	91
Implications for Research.....	92
Implications for Practice	94
Conclusion.....	95
REFERENCES	96
APPENDIX A. RECRUITMENT SCRIPT FOR STUDENT-ATHLETES AT THE	108
UNIVERSITY OF JAMESTOWN.....	108
APPENDIX B. INFORMED CONSENT.....	109
APPENDIX C. DEMOGRAPHIC INFORMATION.....	111
APPENDIX D. STUDENT ATHLETES’ MOTIVATION TOWARDS SPORTS AND ACADEMICS QUESTIONNAIRE.....	114
APPENDIX E. SHORT GRIT SCALE	117
APPENDIX F: INSTITUTIONAL INTEGRATION SCALE-REVISED.....	119

LIST OF TABLES

<u>Table</u>	<u>Page</u>
1. Estimated Probability of Competing in Athletics Beyond the High School Interscholastic Level	43
2. Frequencies and Percentages for the Demographic Variables.....	58
3. Pearson Correlation Table.....	71
4. Unstandardized and Standardized Direct Path Coefficients for the Proposed Path Model	72
5. Unstandardized and Standardized Indirect Path Coefficients for the Proposed Path Model...	73
6. Chi-square Statistic and Fit Indices for the Path Models.....	74
7. Unstandardized and Standardized Direct Path Coefficients for the Path Model with Only Statistically Significant Paths	75
8. Unstandardized and Standardized Indirect Path Coefficients for the Final Path Model	76
9. ANOVA Results for Gender.....	79
10. ANOVA Results for Race.....	80
11. ANOVA Results for Type of Sport	81

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1. Model for college student-athlete academic success	46
2. Proposed MEGSA path model.....	68
3. Standardized coefficients for the proposed path model.....	72
4. Standardized coefficients for the path model with only statistically significant paths.....	75

CHAPTER 1. INTRODUCTION

Each fall, a new class of young freshmen flocks to colleges and universities across the country with the hope of learning in their field of interest, qualifying for a better job, making new friends, and, for some, continuing to participate in their favorite activities. For many students, their dreams fade, and after a semester, a year, or, for some students, even longer, they leave without a degree and have accumulated significant debt. In its 2015 report, ACT noted that the average retention rate for public, 4-year institutions was 64.2%, with nearly 1 in 3 students no longer persisting to their sophomore year of college (ACT, 2015). Similarly, according to the National Center for Education Statistics (NCES), nearly 3 of every 10 full-time, degree-seeking undergraduates do not return to a given institution for a second year, and only 59% of students who began their studies in 2007 graduated within 150% of the normal time required, or 6 years (US Department of Education NCES, 2015). For 2-year, degree-granting institutions, only 29% of the first-time, full-time undergraduate students who began their pursuit of a certificate or an associate's degree in fall 2010 attained it within 3 years. Consequently, according to the Organization for Economic Cooperation and Development (OECD), the United States ranks a dismal 14th among the 37 OECD countries in the number of 25- to 34-year-olds with a bachelor's degree (2012).

Despite these dismal statistics, the National Center for Educational Statistics website (n.d.) indicates that, between 2002 and 2012, the number of 18- to 24-year-olds enrolled at degree-granting institutions in the United States increased by 10% from 28.5 million to 31.4 million, and the percentage of the nation's 18- to 24-year-olds who were enrolled in college rose from 37% to 41% during that same period. These statistics send an important message for young people, implying that earning a college degree is increasingly desirable.

According to the Center on Education and the Workforce, “65% of all jobs in the economy will require postsecondary education and training beyond high school by 2020” (Carnevale, Smith & Stroh, n.d.). From a financial perspective, achieving such an education offers hope for significant financial gain. Observing data from the Census Bureau’s American Community Survey, Hershbein and Kearney (2014) examined over 80 majors, noting that the cumulative lifetime earnings for graduates in these majors ranged from just under \$800,000 to over \$2 million. This income level is over twice what a typical high-school graduate earns and more than \$335,000 more than what the typical associate-degree graduate earns in his or her lifetime (2014). From an economic perspective, students who go to college and, more importantly, persist through graduation to earn at least a bachelor’s degree are substantially better off than people who do not.

Economics aside, the authors of the *Education at a Glance Report* intimate that higher education is not only associated with higher earnings, but also with better health, more community engagement, and a greater degree of social cohesion (OECD, 2012). College completion offers more than simply obtaining the skills necessary to get a good job and to achieve financial success. Students who do not persist through college may deny themselves the opportunity for social, intellectual, and cultural development that leads to a more enriched life. In an interview with *The World Post*, Zakaria (2015) suggested that the future of a country like the U.S. rests on our ability to master how technology interacts with human life, work, and play. The author posits that developing skills such as creativity, aesthetic sensibility, and social, political, and psychological insight are best fostered through the liberal arts. He intimates that institutions of higher education are populated by professors and others who have dedicated their careers to research and conversations about what we can know scientifically, understand

humanistically, and express artistically. Higher education has long been a place where students interact with faculty to stimulate conversations that lead to curiosity of thought, and intellectual and social development, all of which contribute to the ultimate ideal of an educated society: the ability to live a deeper, more meaningful life.

From an institutional perspective, colleges and universities invest heavily to get students to enroll. According to one of the nation's top higher-education consulting firms, private colleges spent an average of \$2,232 to recruit each new student in 2015 while public universities spent \$578 to recruit each new student (Ruffalo Noel Levitz, 2015). Losing these students costs universities not only this initial investment, but also tens of thousands of dollars in potential tuition revenue, alumni gifts, and public and private support.

Reputationally, colleges have equally as much to lose when the students they enroll do not become graduates. Late in 2015, the White House unveiled a website that provides information about annual costs, graduation rates, and salaries after graduation (College Scorecard, 2015). Designed to ensure that all Americans have access to reliable data about every institution of higher education, these initiatives further demonstrate the need for institutions to achieve successful outcomes for their students. When an institution's outcomes are not favorable, its reputation is at stake, a problem that can lead to declining enrollment, disenfranchised alumni, and even the loss of future federal and state financial aid.

State and federal governments have begun to recognize the financial implications that exist when students who begin college do not persist, and are beginning to hold colleges and universities responsible. In fact, the U.S. Department of Education has indicated that by 2018, federal financial aid will be tied to college performance. Although widely contested, a new college rating system that is under consideration proposes to assess colleges based on three

metrics: (a) access, including the percentage of students receiving Pell Grants; (b) affordability, including net price and loan debt; and (c) outcomes, including graduation and transfer rates, graduates' earnings, and the completion of advanced degrees (U.S. Department of Education, n.d.). These ratings would be published annually to guide students and their parents as they consider college choices, and the ratings would be incorporated into the U.S. Department of Education's College Scorecard. A proposed consequence for poor ratings, the department intends to hold students and colleges receiving student aid responsible for the student making progress toward a degree, and encourages the states to join in these efforts by challenging them to tie state funding for public colleges and universities to performance.

The U.S. Government has recognized that as students accumulate significant debt and then do not persist to graduation, their ability to obtain the type of employment necessary to repay such debt becomes much less likely, potentially shifting the financial burden to the U.S. taxpayers. According to *U.S. News and World Report*, in 2014 nearly 7 in 10 graduating seniors left school with an average debt of \$28,950 while the nation's cumulative student-loan debt tops \$1.1 trillion. A recent Harvard study, "Pathways to Prosperity," reported that, among all 4-colleges and universities, the United States has the highest college dropout rate among industrialized nations. Unemployment statistics showed that job seekers without a degree are twice as likely to remain unemployed as those seeking employment who have earned a college degree. Students who begin college but do not persist have the economic burden of student-loan debt without the benefit of a larger income and the higher levels of employment that often accompany a college degree.

In response to these mounting pressures, colleges and universities are focusing much more intentionally on their students' retention and graduation rates with an increasing desire to

identify those students who not only can, but will, persist to graduation. Too often in the past, colleges placed the burden of retention on student-affairs staff, focusing significant resources on at-risk students, or on the admissions staff, admitting only those students who have demonstrated high cognitive ability through their ACT/SAT scores or their high school grade-point average (GPA) (DeBerard, Spielmans & Julk, 2004; Gaston-Gayles, 2004; Harackiewicz, Barron, Tauer, & Elliot, 2002; Lins, Abel, & Hutchins, 1966). Once thought to predict successful achievement in college, these cognitive, objective scoring mechanisms do not provide an adequately robust indication of some students' potential. On the contrary, many high-achieving students are unexpectedly failing while students with lower ACT/SAT scores and lower-performing prior academic records indeed persist (Marsh, Vandehey & Diekhoff, 2008; Sadlecek & Adams, 1992). Evidence suggests that, while ACT/SAT scores may predict the first-semester grade-point average, they may not accurately predict graduation rates (Pike & Saupe, 2002).

In an attempt to provide a broad definition of success, Kuh (2009) suggested that students come to college with differing backgrounds, skills, and talents that make some more prepared to succeed academically than others. The author noted, however, that each student has experiences, pedagogies, and contexts that can, and do, have measurable effects on his or her success in college. He, therefore, considered seven outcomes in the definition of student success: Academic achievement, engagement in educationally purposeful activities, satisfaction, acquisition of desired knowledge, skills and competencies, persistence, attainment of educational outcomes, and post-college performance.

As interest in various non-cognitive influences on student success continues to grow, the new federal education law has responded by requiring states to include at least one non-academic outcome in their accountability formulas. Therefore, the Nation's Report Card and the Program

for International Student Assessment (PISA) test will begin asking schools to report the outcomes of survey statements that measure various non-cognitive factors thought to impact persistence (Kamenetz, 2016). In response, California has already begun collecting responses to survey questions that address students' self-reported frequency in finishing what they start, or their ability to accomplish anything with effort (Kamenetz, 2016).

Non-Cognitive Factors that Impact Student Persistence

Considered to be one of the foundational researchers in student-development theory, Arthur Chickering was one of the first people to study non-cognitive conditions that influence a college student's development. Influenced by his landmark book *Education and Identity* (1969), additional contributions have been made by Astin (1993), Bandura, (1977, 1986, 1997), and Pascarella and Terenzini (1991, 2005), Tinto (1975) and others, further demonstrating the relationships between various non-cognitive variables and student persistence. In the book's second edition, Chickering and Reisser (1993) continued their interest in student development by identifying seven vectors that influence student outcomes. These seven vectors include developing competence, managing emotions, moving through autonomy toward interdependence, developing mature interpersonal relationships, establishing identity, developing purpose, and developing integrity.

In describing these vectors, the authors suggested that various influences, such as the relationship between students and their faculty; development through athletic, artistic, and other co-curricular engagement; interactions with other students outside the classroom; and discovery of purpose and ultimate follow-through despite external objections, all affect a student's development and successful completion of college (Chickering & Reisser, 1993). Chickering and Reisser's research served as a foundation from which scholars have continued to explore a

multitude of non-cognitive factors that are posited to impact college students' successful degree completion, particularly as the factors relate to unique student populations (Comeaux & Harrison, 2011; Duckworth, Peterson, Matthews & Kelly, 2007; Gaston, 2002; Gaston-Gayles, 2004; Gayles & Hu, 2009a; Reason, 2009; Sadlacek, 2004; Seidman, 2005; Southhall, 2012). Of particular interest to this research are three non-cognitive factors that are posited to impact a student's persistence through college: motivation, engagement in academically purposeful activities, and grit (Astin, 1985; Comeaux & Harrison, 2011; Duckworth et al., 2007; Gaston, 2002; Gaston-Gayles, 2004, 2009b; Hu and Kuh, 2002; Kuh, 2009a; Kuh, Kinzie, Buckley, Bridges & Hayek, 2006; Pascarella & Terenzini, 1991, 2005; Ryan & Deci, 2000).

Student Motivation

Educational motivation has often been studied from a behaviorist perspective, considering whether the student is motivated extrinsically (honors and awards) or intrinsically (self-motivation and the learning environment). Ryan and Deci (2000) posited that motivation is derived from the individual's underlying attitudes and goals, therefore suggesting that a person's motivations may vary based on the attitudes and goals that he or she set for a particular task. Therefore, students whose attitudes towards their academics are poor, or who have not committed to graduating from college, are thought to be less motivated to sustain the learning behaviors necessary to persist to graduation.

Student Engagement

Posited as one of the most important factors in student learning and personal development during college, Astin (1985) suggested, "students learn by becoming involved" (p. 133). He suggested that students who engage in activities outside the classroom are more likely to persist in college. He defined student engagement as the quality of the effort that students

devote to educationally purposeful activities (Astin, 1993; Pascarella & Terenzini, 1991, 2005). Kuh et. al. (2006) later refined this definition however, to include the “time and effort students devote to activities that are empirically linked to their desired outcomes” (p. 683). According to Kuh, et. al. (2006) students who have established goals for themselves and are willing to devote their time and efforts towards achieving such goals are more likely to persist to graduation.

Student Grit

A more recent contribution to the factors influencing persistence is the evolution of a characteristic known as grit. Grit is defined as the ability to exert passion and perseverance towards long-term goals. Although similar to motivation theory, which includes such constructs as self-efficacy theory, expectancy-value theory, and achievement-goal theory, Duckworth, Weir, Tsukayama, and Kwok (2012) have determined that a relationship exists between persistence and an individual’s ability to stay committed to a desired outcome over long periods of time, a phenomenon they refer to as grit. Grit research suggests that passion and persevere are two predictors of successful completion of a desired outcome. Using a 12-question Grit Scale, individuals achieving a high grit score are thought to be “grittier” and more likely to persist to completion. While limited research has been done to explore the scale’s predictive value as it relates to academic performance (Chang, 2014; Cross, 2013; Engel, 2013; Kohn, 2014), the concept of grit and its relationship to persistence has generated widespread curiosity, resulting in the rapid rise of the scale’s application (Kamenetz, 2016).

Intercollegiate Student-Athletes

The college experience for student-athletes is often much different than the experience for general students. Faced with significant time commitments for practice, weight training, travel, and competitions, not to mention the mounting pressure to win games, to build

institutional brand recognition, and to promote alumni and media loyalty, many student-athletes also face potential discrimination from their peers as well as their classroom faculty (Engstrom, Sedlacek & McEwen, 1995). Many scholars have posited that this student population warrants additional research (Adler & Adler, 1991; Carodine, Almond, & Gratto, 2001; Engstrom et al., 1995; Engstrom & Sedlacek, 1989, 1991; Sedlacek, 2004; Sowa & Gressard, 1983).

Interested in the identity development of student-athletes, Adler and Adler (1991) chronicled the experience of collegiate athletes at a highly successful Division I university over a period of four years. The authors noted that these students entered college with both academic and athletic goals and aspirations. As the demands of their sport became greater and their success on the court more profound however, these student-athletes began to forfeit their social and academic roles in favor of their athletic roles. Despite the initial goals and aspirations to attain a college degree, Adler and Adler (1991) noted that these student-athletes faced significant challenges in persisting to graduation.

According to the National Collegiate Athletic Association (NCAA.org) and the National Association of Intercollegiate Athletics (NAIA.org), roughly 520,000 students continued their athletic careers at the collegiate level in 2014. These student-athletes contribute immensely to the institution's fabric. For larger universities, these students contribute to the institution's ability to attract significant media attention and may, ultimately, result in professional contracts for the student-athlete. At smaller and mid-sized institutions, athletics provides activities for the student body, promotes school spirit, and provides the student-athlete with similar development opportunities that other extra-curricular activities provide to the general student.

When the student-athletes do not persist, it is not only disappointing for them, institutions are also blemished when the significant scholarship support they gave to a student-athlete did not

result in a graduate of the institution. These students are often well-known at their institutions and, in some cases, may even represent the university's brand. When these student-athletes do not persist, the institution's reputation is harmed, relationships with donors may be jeopardized, and competitive advantages are potentially lost as a result of NCAA and NAIA sanctions.

Interested in studying this unique population of students, Gaston-Gayles (2004) considered the relationship between motivation and academic performance for student-athletes at a large, public Division I university. The author noted that motivation was related to academic performance for the student-athletes surveyed, accounting for 9% of the variance. In her research, Gaston-Gayles used expectancy-value theory, self-efficacy theory, and attributional theory to develop an instrument that divides student-athlete motivations into three particular subscales: Academic Motivation (AM), Student-Athlete Motivation (SAM), and Career-Athletic Motivation (CAM). The results of this research provided further clarity about the uniqueness of a student-athlete's motivation towards his or her academic and athletic goals. Student-athletes are thought to be people who are motivated to succeed, at least athletically, and have often exhibited passion and perseverance in their desire to achieve excellence in their sport.

Student-athletes with certain talents and skills are able to continue participating in their sport beyond high school and are often compensated, through scholarships, for their involvement. In their pursuit of athletic success, however, many student-athletes experience significant challenges both while participating in their sport and in the classroom, many of which can lead to dropout (Adler and Adler, 1991; Sedlacek and Adams-Gaston, 1992; Shulman and Bowen, 2001). C. Peterson, Ruch, Beermann, Park, & Seligman (2007) noted however, that perseverance in the face of adversity is strongly associated with an orientation toward engagement. Because of the challenging nature of college athletics and the need to achieve at a

higher level than traditional students, athletes must be willing to engage themselves in deliberate practice, diligence, and hard work. Incorporating grit with two of the more traditionally studied non-cognitive constructs of motivation and engagement may contribute to what is currently missing when it comes to understanding the achievements of student-athletes.

Statement of the Problem

The problem addressed in this study suggests that student-athletes are a unique population of students whose collegiate experience is different from the general student population and therefore, it is unknown whether the literature related to student success in college applies to this unique population of students. Combined with their desire to achieve a college degree, student-athletes also aspire to excellence in their sport. Contributing to the problem is the desire of the institution and its coaches to not only graduate students, but also to win games. This bifurcation of goals, aspirations and pressures is a burden uniquely shouldered by student-athletes, and therefore to achieve success these students must possess various non-cognitive characteristics that complement the more traditional cognitive predictors of student success in college.

Purpose of Study

The purpose of this research was to examine non-cognitive factors that impact persistence of student-athletes, specifically the relationships among motivation, engagement, grit, and persistence, and whether such relationships vary by gender, race or sport. The study utilized a proposed path model: the Motivation, Engagement, and Grit of Student-Athletes (MEGSA) model, the results of which provide greater clarity of understanding of what factors influence student-athlete's likelihood of achieving success both in the classroom and in their sport, therefore contributing to the existing body of research related to college persistence.

Research Questions

1. Is there a relationship among student-athletes' motivation as measured using three motivational subscales: Academic Motivation, Student-Athletic Motivation, Career-Athletic Motivation and Persistence, and what role do Engagement and Grit play in mediating that relationship?
 - A. Do Academic Motivation, Student-Athletic Motivation, or Career-Athletic Motivation influence Persistence directly and indirectly through Engagement and Grit?
 - B. Do Engagement and Grit directly influence Persistence?
2. Do Academic Motivation, Student-Athletic Motivation, Career-Athletic Motivation, Engagement, Grit, or Persistence vary by gender, race, or sport?

Significance of the Study

According to the National Federation of State High School Associations, nearly 8 million students participate in high-school athletics (NFHS.org). Many of these student-athletes desire to continue playing their sport at the collegiate level. The significance of this study could help inform the discussion surrounding admission considerations and support services suggested by the NCAA, the NAIA and college athletic departments. The current policies rely primarily on cognitive inputs alone to determine which students to admit, yet many are not persisting to graduation at rates that should be expected (Sedlacek & Adams-Gaston, 1992). Acknowledging the limitations of standardized test scores however, several colleges and universities are seeking other, more relevant indicators for the potential success of their students and student-athletes in their selection process. Students who demonstrate that they are motivated to persist, are committed to engage academically and socially in educationally purposeful activities, and have

the qualities to overcome challenges en route to degree completion may be more likely to persist. Results from the MEGSA model could provide significant insight as institutions and their athletic departments seek to enroll and support student-athletes who are most likely to be successful both in the classroom and on the playing field. Considering the extensive costs associated with recruiting and retaining students and student-athletes alike, combined with the financial and societal implications of attrition, a study of the variables proposed in this study could contribute significantly to existing research related to factors influencing successful degree completion.

Definition of Terms

Engagement. Engagement is defined as the time and effort students devote to activities that contribute directly to desired outcomes (Kuh, 2009a).

Grit. Grit is defined as passion and perseverance towards achieving long-term goals (Duckworth et al., 2007).

Persistence. Persistence is defined as the students' actions and individual goal attainment in their pursuit of degree completion. For measurement purposes, persistence will consider the student's enrollment at any given point during an academic career (Horn, Kojaku, & Carroll, 2001). According to the authors, the optimal path toward obtaining a bachelor's degree is for students to be enrolled in college, uninterrupted, for four years (immediate transfer to another school counts as continuous enrollment.). The graduation requirement for the University being studied is 128 credits; therefore, for the purposes of this research, 16 credits per semester completed will be considered the standard by which the Persistence Factor will be measured.

Persistence Factor. For the purposes of this research, Persistence Factor is a score that is used to assess student-athletes' persistence towards degree completion. To measure whether a

student-athlete is persisting to graduation within four years, the required 16 credits per semester will be used as the denominator. The formula for calculating this factor is as follows:

$$\text{Persistence Factor} = \frac{\text{Credits earned / number of semesters completed}}{16} \quad (\text{Equation 1})$$

Scores of 1 or greater represent students who are persisting to graduation in a timely manner. Scores of less than 1 will represent students who are not persisting to graduation within in a timely manner.

Credits Earned. Credits earned will include the total number of credits for which a grade of D- or better was earned as reported by the student-athlete, regardless of where or when the credits were earned.

Retention. Retention is the rate at which students as a whole persist in their educational program at an institution. Retention is often expressed as a percentage (U.S. Department of Education, NCES, 2015-16).

Semesters completed. The number of semesters completed is defined as the semesters completed by the student during which he or she was enrolled as degree seeking student, whether part time or full time. The semester during which the survey is being taken will not be included as a semester because the student would not yet have completed that semester.

Delimitations of this Study

The students represented in this research were from a single institution, and although they came from nationally geographically diverse areas, they may or may not be representative of students at other institutions, or institution types, who are competing in other athletic divisions or in other regions of the country.

CHAPTER 2. LITERATURE REVIEW

College access and degree completion are topics of national interest and concern as institutions of higher education grapple with the consequences of admitting or not admitting students who have the best chance of achieving success. Historically, two similar, but distinct, lenses have been used to frame the topic of student success and successful degree completion: persistence factors, which are considered to be individual attributes and attitudes that contribute to the students' ability and desire to persist to graduation, and retention factors, which refer to institutional characteristics and initiatives designed by the university in order to help retain students (Hagedorn, 2006; Reason, 2009; Seidman, 2005; U.S. Department of Education NCES, 2015-16; York, Gibson, & Rankin, 2015;). Individual characteristics that have demonstrated a relationship with student success include cognitive characteristics, such as ACT/SAT scores and high-school GPA, and non-cognitive characteristics which consider the student's actions, attitudes, and behaviors both academically and socially. Institutional characteristics include both the formal and informal academic and social structures that are availed to the students to support their needs while they are moving towards degree completion. The purpose of this research is to study three specific non-cognitive, individual qualities (motivation, engagement, and grit) that are posited to predict persistence in college, specifically among student athletes (Astin, 1993; Bandura, 1986; Carodine, Almond & Gratto, 2001; Duckworth, Matthews & Kelly, 2007; Gaston-Gayles, 2005; Pascarella & Terenzini, 1991, 2005; Sedlacek, 2004a; Sowa & Gressard, 1983; Tinto, 1975), and the relationship that each quality has with the others by utilizing a proposed path model: the Motivation, Engagement and Grit of Student-Athletes (MEGSA) Model. This chapter presents a summary of the literature related to an individual's cognitive and non-cognitive characteristics, and their relationship to persistence and student success, with a

more limited discussion about the institution's academic and social support systems that are designed to help retain students.

Persistence and retention are words that are often used interchangeably as measure of students' academic success; however, these two factors are not the same. In an attempt to properly clarify the various ways in which individuals discuss student movement through the education system, the National Center for Education Statistics defines retention as

a measure of the rate at which students persist in their educational program at an Institution; this measure is often expressed as a percentage. For four-year institutions, this is the percentage of first-time bachelor's (or equivalent) degree-seeking undergraduates from the previous fall who are again enrolled for the current fall. (U.S. Department of Education, NCES, 2015-16)

Persistence, on the other hand, is a term that is most often used to discuss the individual student's actions that contribute to positive degree attainment. Pascarella and Terenzini (2005) intimated that the overwhelming majority of students cite degree completion as the ultimate goal of their educational journey. In their attempt to define student success, York, Gibson, and Rankin (2015) suggested that persistence can and should capture individual students' academic goals across multiple programs of study and in various institutional contexts. The authors posited that persistence captures the focus, drive, and forward progression needed by students to complete a program of study. Seidman (2005) defined persistence as the "desire and action of a student to stay within the system of higher education from beginning through degree completion" (p. 14). Later, Reason (2009) defined persistence as an individual phenomenon, focusing the attention on the individual-level student-goal attainment and suggesting that

persistence is the positive outcome of college attendance. In one of the briefest and simplest explanations, Hagedorn suggested, “institutions retain, and students persist” (2006, p. 6).

For further clarification, it is important to note that graduation rates are not the same as retention rates. In higher education, students who successfully complete a prescribed set of courses in a particular interest area are considered to have achieved academic success and, therefore, earn the coveted title of “college graduate.” These graduates are considered to have persisted at the university where they completed the prescribed course of study. For the purposes of this study, persistence is defined as the students’ actions and individual-level goal attainment in their pursuit of degree completion. Of particular interest are three non-cognitive factors that are posited to impact persistence: motivation, engagement, and grit. Each non-cognitive factor that is addressed in this study will be reviewed, first, in relationship to all students, followed by a discussion of student-athletes. Cognitive factors such as ACT/SAT, high school GPA and high school curriculum will also be discussed due to their previously suggested relationship to persistence and graduation.

The Significance of Degree Completion

The benefits that often accompany successful degree completion include higher earnings, a better quality of life, and professional flexibility for the student as well as a more highly educated population for our nation as a whole. According to the Center on Education and the Workforce “65% of all jobs in the economy will require postsecondary education and training beyond high school by 2020” (Carnevale, Smith & Stroh, n.d.). From a financial perspective, successful degree completion offers the hope of significant financial gain. Hershbein and Kearney (2014) examined over 80 majors and found that the cumulative lifetime earnings for people holding degrees in those majors ranged from just under \$800,000 to over \$2 million. This

income level is over twice what a typical high-school graduate earns and more than \$335,000 more than what the typical associate-degree graduate earns during his or her lifetime.

Successful degree completion, however, is not only about obtaining the skills necessary to get a good job and to secure higher earnings. The Organization of Economic Cooperation and Development (OECD, 2012) suggests that better health, enhanced community engagement, and greater social cohesion are important, intangible outcomes of college graduation. In an interview with *The WorldPost*, Zakaria (2015) suggested that the future of a country like the U.S. rests on our ability to master how technology interacts with human life, work, and play. The author posits that developing skills such as creativity; aesthetic sensibility; and social, political, and psychological insight is best fostered through the liberal arts. Zakaria suggests that institutions of higher education are populated by professors and others who have dedicated their careers to research and conversations about what we can know scientifically, understand humanistically, and express artistically. Higher education has long been the place where students interact with faculty in stimulating conversations that lead to curiosity of thought, as well as intellectual and social development, all of which contribute to the ultimate ideal of an educated society: the ability to live a deeper, more meaningful life. Consequently, people who do not attend and, ultimately, graduate from college are denied the opportunity to have the social, intellectual, and cultural development that leads to a more enriched life.

According to the National Center for Educational Statistics (NCES) (U.S. Department of Education, NCES, 2015), the number of students enrolled at degree-granting institutions in the United States is on the rise. Between 2002 and 2012, the number of 18- to 24-year-old students enrolled at U.S. degree-granting institutions went from 28.5 million to 31.4 million, an increase of 10%. During that same period, the percentage of the nation's 18- to 24-year-olds who were

enrolled in college rose from 37% to 41%. Although the number of students entering college is increasing, what is not as promising is the number of students graduating from college. In its 2015 report, ACT noted that the average retention rate for public, 4-year institutions was 64.2%, with nearly 1 in 3 students no longer enrolled for their sophomore year of college (ACT, 2015). Similarly, according to the National Center for Education Statistics, nearly 3 of every 10 full-time, degree-seeking undergraduates do not return to a given institution for a second year, and only 59% of the students who began their studies in 2007 graduated within 6 years (US Department of Education NCES, 2015). Consequently, according to the Organization for Economic Cooperation and Development, the United States ranks 14th of the 37 OECD countries in the number of 25- to 34-year-olds with a bachelor's degree (OECD, 2012).

According to the most recent survey of college pricing, the College Board reported that the average cost of tuition and fees for 2015-16 was \$32,405 at private colleges and \$9,410 at in-state, public colleges (College Board, 2015-16). Consequently, for people who begin college but do not graduate, the dropout cost is significant. According to the most recent *U.S. News and World Report* data, approximately 70% of the 2014 graduates left college with an average debt of \$28,950 while the nation's cumulative student-loan debt tops \$1.1 trillion. For individuals who do not achieve the dream of finishing college and obtaining a degree, therefore not availing themselves of the tangible and intangible benefits that accompany such a degree, the costs can be crippling. Understanding the factors that help identify which students are most likely to be successful in college is a matter of great concern and, therefore, warrants continued research, particular for unique populations of students whose collegiate experiences may differ from the general student population (Pascarella & Terenzini, 2005; Sedlacek, 2004).

Persistence and Student Success

Student persistence is defined as the students' actions and individual-level goal attainment in his or her pursuit of degree completion. Factors that contribute to the successful attainment of degree completion are often discussed as either cognitive and demographic factors or non-cognitive factors. Each of these factors as they relate to the general student population are described below followed by a discussion of these factors as they relate to the unique population of students of interest in this study, student-athletes.

Cognitive Factors and Student Persistence

Despite the inconsistency with predicting first-year academic success, cognitive factors, such as ACT/SAT scores combined with high-school GPA, are often considered the standard for admission to many American colleges and universities. In an early study conducted by Lins, Abel, and Hutchins (1966), the authors examined the usefulness of the ACT/SAT score, high-school GPA, and high-school class rank to predict academic success during a student's first semester in college, concluding that high-school GPA was the most significant predictor of first-semester success. Later, Pike and Saupe (2002) studied these variables, noting that both ACT/SAT score and high-school GPA positively correlate with college students' academic success and explaining about one-fourth to one-third of the variance in first-year grades. Concordantly, the research of DeBerard, Spielmans and Julka (2004), Gaston-Gayles (2004); Harackiewicz, Barron, Tauer, and Elliot (2002); and Pike and Saupe (2002) found that ACT and SAT scores were positively correlated with academic success, both in the short term and the long term.

Years later, however, Adelman (2006) concluded that the quality of a student's high-school curriculum was more influential in predicting the successful completion of the first year

in college than the student's high-school GPA or SAT/ACT test scores. Similarly, Trusty and Niles (2003) found that the difficulty level of a student's high-school curriculum was one predictor of persistence towards degree completion. The authors posited that students who challenge themselves in high school by taking more rigorous courses are likely to demonstrate higher levels of motivation than students who take easier courses. The more studious students, perhaps, had goals to attend college and, therefore, were motivated to prepare themselves academically by taking more difficult courses while in high school.

For racial/ethnic minority, non-Caucasian, and nontraditional students, correlations between the cognitive variables and persistence are less conclusive (Marsh, Vandehey, & Diekhoff, 2008; Sedlacek & Adams-Gaston, 1992). Marsh et al. concluded, for example, that although both ACT and SAT scores contributed to academic performance, the scores' usefulness was better when considered in coordination with other cognitive and non-cognitive variables.

Demographic Factors and Student Persistence

In addition to the cognitive factors that impact students' college success, other factors that are commonly included are gender, race/ethnicity, and socioeconomic status (SES). In their study of socio-demographic characteristics and retention, Peltier, Laden, and Matranga (1999) concluded that gender was significantly related to persistence, noting that women persisted at higher rates. Reason (2003), however, discovered mixed results. Although the author noted a relationship between gender and academic success, the differences disappeared when other factors, such as racial and ethnic differences, were considered.

After controlling for gender and race/ethnicity, Pascarella and Terenzini (1991, 2005) noted that students' socioeconomic status is also significantly related to college persistence. Researchers defined SES as a composite of mothers' and fathers' educational attainment along

with family income. In a large-scale comparison of White, Hispanic, and African-American students in Indiana, Hu and St. John (2001) found that socioeconomic status was related to differences in persistence. Bui (2002) reported that students whose parents did not attend college are more likely to require additional time when studying, also noting that these students receive less financial support and encouragement from their parents. Choy (2002) discovered that these first-generation college students advance to their second year of college and eventually graduate at a lower rate than continuing-generation students.

Non-Cognitive Factors and Student Persistence

For the purposes of this study, non-cognitive attributes of a student enrolled in higher education are considered to be the personal actions, attitudes, and behaviors of the student that contribute to his or her persistence through college and, ultimately, to successful degree completion. Three specific factors of interest for this study are motivation, engagement, and grit.

Motivation and student persistence. Motivation refers to anything that initiates and sustains learning behavior (Palmer, 2005). Educational motivation has typically been studied from either a behaviorist perspective, emphasizing the impact of environmental factors such as honors and awards (extrinsic motivation), or a social-cognitive perspective, emphasizing the significance of students' beliefs about themselves and the learning environment (intrinsic motivation). Ryan and Deci (2000) define motivation as "being moved to do something" (p. 54), suggesting that, if a student feels no inspiration to act, he or she is unmotivated. The authors posited that motivation is derived from the individual's underlying attitudes and goals, and is not a unitary phenomenon. Kuh (2009a) later added that students are motivated to engage in activities that are perceived to help them achieve a desired outcome, thereby suggesting that peoples' motivation may vary based on the attitudes and goals that they may have about a given

task or a desired outcome. Such actions are often intrinsically or extrinsically rationalized.

Beghetto (2004) posited that student motivation provides the greatest contribution to students' academic success.

Achievement-motivation theory. Achievement-motivation theory suggests that students have a range of personal goals, mastery goals, and performance goals. Personal goals include social goals and gaining the approval of their teachers and their peers; mastery goals include the students' desire to learn or to master concepts and facts; and performance goals include the students' desire to demonstrate success to others by outperforming their peers. Research has found that students achieve greater success in the classroom when they establish goals that are more focused on themselves, as opposed to focusing on the need to outperform their classmates (Pintrich, 2000). Three specific achievement-motivation theories that informed this research are expectancy-value theory, self-efficacy theory, and attribution theory, each of which is described in the following sections.

Expectancy-value theory. An achievement-motivation theory originally developed by Atkinson (1964), expectancy-value theory suggests that motivation can be explained by factors that affect how people approach success or avoid failure. According to this theory, the degree to which an individual is motivated or energized to excel is a function of (a) the individual's perceived probability that he or she will successfully complete a task and (b) the value that he or she associates with successfully completing the task (Spence & Helmreich, 1983). In later studies, authors identified three additional key constructs that affect motivation: ability beliefs, expectancy beliefs, and task value (Eccles, 1983; Eccles & Wigfield, 1992; Wigfield & Eccles, 2000). The authors explained that expectancy, or the probability of success, is influenced by people's self-concept about their ability to successfully complete a task and the level of difficulty

associated with completing the task. The value attached to a task is a function of the extent to which the task fulfills a need, aids in current goal attainment, and is important to fulfill a future goal. The difference between ability and expectancy beliefs is a function of time; whereas ability relates to an individual's assessment of his or her current abilities, expectancy beliefs relate to the individual's prediction about how he or she will perform in the future. Task value, the authors noted, relates to the importance that the individual places on successfully completing a task, how much he or she would enjoy the process, how useful the task is in helping him or her to achieve a future goal, and what he or she is willing to give up in order to successfully complete the task. In summary, expectancy-value theory suggests that, if a student does not believe, with a high degree of certainty, that he or she is likely to be successful at a given task, or if he or she does not value the idea of excelling at that task, he or she will exert little energy towards achieving success in that area and, therefore, is not likely to persist.

Self-efficacy theory. Self-efficacy is an achievement-motivation theory that is often defined as the judgments that individuals hold about their capabilities to learn or to perform at desired levels (Bandura, 1977, 1986, 1997). Self-efficacy theory refers to the way in which an individual views his or her capability of accomplishing a task. This theory postulates that people determine if they will attempt a task, how much effort they will exert, how long they will persist when facing obstacles, and how resilient they will be in the face of adverse situations based upon their belief about whether they have the ability to be successful. Bandura (1986) posited that people's beliefs about their abilities are more predictive of future behavior than their actual skill level, knowledge, or prior success. Later, Graham and Weiner (1996) concluded that, in psychology and education, self-efficacy is a more consistent predictor of behavioral outcomes than any other motivational construct. While expectancy theory is based upon an individual's

belief in the likelihood of a successful outcome (If one puts forth the effort, success is highly probable.), self-efficacy helps foster that outcome. When an individual believes that he or she has the ability to perform the task necessary to achieve the desired results, he or she will be more motivated to attempt the task. An individual, for example, may realize that running the 400-meter dash in under 48 seconds will result in a trip to the national tournament, but may not believe that he or she has the required speed or endurance; therefore, the person will not attempt to prepare for the race. Similarly, if a student does not believe that he or she has the ability to do well in math despite significant effort, he or she may avoid selecting a major or taking courses that include a mathematical component.

According to self-efficacy theory, individuals form their self-efficacy by interpreting information primarily from four sources: past mastery experiences, vicarious learning, social persuasion, and physiological reactions (Pajares, 2009). For most people, the most influential source of self-efficacy results from the way in which they interpret the results of their own previous performance; the more successful someone has been at achieving desired results, the higher his or her self-efficacy. Vicarious learning as a source of self-efficacy is a response that an individual may have from watching others perform (“if he can do it, I can do it” response). Although not as strong as past mastery, vicarious learning can be a powerful influence on self-efficacy beliefs as individuals attempt to model and/or make social comparisons to one another.

Social persuasion as an influence on self-efficacy is a result of verbal messaging. People who are positively persuasive can provide the encouragement individuals need in order to help convince others that they are capable of performing a certain task or achieving a certain result. Negative persuaders can undermine a person’s sense of self-efficacy, resulting in one’s disinterest in attempting or completing a task (Parjares, 2009).

Attribution Theory. Attribution theory is an achievement-motivation theory that is based on the underlying assumption that individuals seek explanations for the causes of behavioral outcomes (Weiner, 1992). The theory presumes that, as tasks are completed, individuals search for reasons to justify the results and the strategies that led to the outcome, especially when the outcome is negative (Graham & Weiner, 1996). Individuals process these reasons in order to determine if and how they will approach future similar situations. Three factors are thought to be central to attribution theory: locus of control, stability, and controllability.

Locus of control refers to the level of ownership that people believe they have over an outcome. An internal locus of control exists when individuals feel as though they have ownership over an achievement-oriented outcome. An external locus of control exists when an individual feels as though someone else controls the outcome. A student, for example, may believe that, no matter how hard he or she works, a faculty member may not be objective with grading simply because he or she is of a particular race, gender, or some other pre-conceived bias.

Engagement and Student Persistence. As early as 1969, Arthur Chickering began exploring non-cognitive, environmental conditions that influence a college student's development. In his landmark book *Education and Identity*, Chickering (1969) identified seven vectors which contribute to the creation of a student's identity. A central theme of his work was that colleges and universities are uniquely suited to promote the development of human potential and that educational practices should be designed to promote such development. Although evidence suggested a relationship between successful achievement in college and cognitive factors, such as ACT/SAT scores, high-school GPA, and high-school curriculum, Chickering and others noted that relying solely on these cognitive variables is not enough. Many high-achieving students unexpectedly fail while students with lower cognitive ability and less-successful prior

academic performance succeed. Chickering's (1969) early work suggested that much more could be done while students are enrolled in college to encourage and support their development and, ultimate, success. As a result, authors such as Adams-Gaston (1992), Astin (1993), Bandura (1977, 1986, 1997), Chickering and Reisser (1993), Comeaux and Harrison (2011), Duckworth, et al (2007), Gaston (2002), Gaston-Gayles (2004), Gayles & Hu, (2009a, 2009b), Pascarella and Terenzini (1991, 2005), Reason (2009), Sadlacek, (2004a), Sadlacek, Seidman (2005), Southhall (2012), and Tinto (1975, 1993) continued to explore individual characteristics, attitudes, and behaviors that contribute to persistence through college and, ultimately, to degree completion.

In his early studies of student departure, Vincent Tinto (1975, 1993) introduced the importance of student integration as a predictor of student success. The author suggested that, for students to be successful, they must integrate, both formally and informally, into the academic and social systems of the college (Tinto, 1993). Tinto added that academic and extracurricular success is often influenced by the students' informal interaction with faculty and staff outside the classroom as well as with their peers in non-academic, social settings.

When examining students' persistence from the perspective of student commitments and expectations, Tinto (1975) presented his theoretical model of dropout, attempting to explain the longitudinal process of interactions that would lead various students to exhibit different forms of persistence. The author posited that the individuals' expectational and motivational attributes must be considered in developing the model. Referred to as an individual's *educational-goal commitment*, Tinto noted that this measure was an important predictor of the manner in which individuals interact with their college environment. Tinto found that, as people's commitment to their educational goals increases, so does their persistence to degree completion. Additionally, Tinto believed that an individual's *institutional-goal commitment* was also an important factor

that influenced a student's persistence in college. The more time that an individual engaged in various activities while attending a particular institution, the more likely he or she was to persist.

Posited as one of the most important factors in student learning and personal development during college, Astin (1984) suggested, "Students learn by becoming involved" (p. 133). In his research, the author suggested that it is the students' responsibility to engage in such opportunities by availing themselves of the co-curricular and extracurricular activities that the institution provides. Students who engage in such opportunities outside the classroom are more likely to persist and, therefore, to achieve the ideals and advantages of a college degree.

In their effort to assess students' academic and social integration at college, Terenzini and Wright (1987) examined the number of hours that students indicated they spent interacting with faculty outside class and how much time they engaged in organized extracurricular activities. In this study, the authors found that the amount of time students spent participating in these activities had a direct and positive effect on students' academic skill development. Nora and Cabrera (1993) later defined academic and social integration as the development of a strong affiliation with the college environment, both inside and outside the classroom. Academic integration, they suggested, relates to a student's interactions in class with faculty and other students. Social integration relates to the informal relationships that a student develops with his or her peers, faculty, and staff by participating in organizations and collegiate activities outside the classroom (Nora & Cabrera, 1993).

Related to Tinto (1975) and Astin's (1984) introduction of student integration and its relationship to student success is the concept of student engagement, which was defined as the quality of the effort students devote to educationally purposeful activities (Astin, 1984, 1993; Pascarella & Terenzini, 1991). Hu and Kuh (2002) expanded this definition to include "the

quality of effort students themselves devote to educationally purposeful activities that contribute directly to desired outcomes” (p. 3). More recently, Kuh (2009a) refined the definition to include “the time and effort students devote to activities that are empirically linked to desired outcomes of college” (p. 683).

In their extensive work related to student success, Pascarella and Terenzini (2005) found that persistence was largely determined by a student’s involvement inside and outside the classroom, noting that the more intensely students engaged with their college environment, both academically and socially, the greater the potential for satisfaction; achievement; and, thus, persistence. The authors noted that “the impact of college is largely determined by individual effort and involvement in academic, interpersonal and extracurricular offerings on a campus” (p. 602). Pascarella and Terenzini (2005) suggested that successful college students change in holistic ways that often originate from the multitude of influences that they experience, both academically and non-academically. The authors specifically noted the effects of fraternity or sorority membership, intercollegiate-athletic participation, work during college, and interaction with racially diverse peers.

Synthesizing the work of Astin (1984, 1993), Nora and Cabrera (1993), Pascarella and Terenzini (2005), and Terenzini and Wright (1987), Tinto (1975) one might posit that a student’s willingness to engage, both academically and socially, is a result of his or her educational-goal commitments and his or her institutional-goal commitments. Students who are committed to achieve success in a desired outcome are more motivated to engage in activities that are perceived to help achieve such goals.

Grit and Student Persistence. Grit, by definition, entails working strenuously toward challenges, maintaining effort over years despite failure and adversity. Constructed from

achievement-motivation theories, Duckworth, Weir, Tsukayama, and Kwok (2012) suggested that a relationship exists between an individual's goal commitment and his or her perceived benefits, cost, and the likelihood of realization: a combination of characteristics that they posit leads to grit. They define grit as the passion and perseverance towards long-term goals.

Duckworth et al. (2012) suggested that an individual's willingness to exert energy to accomplish a specific task is a marker on the path for achieving long-term success, noting that much of success is a result of consistently showing up when others do not. A benefit of routinely exerting the energy to show up, which Ryan and Deci (2000) defined as motivation, the individual becomes more "practiced," a phenomenon that is often necessary to achieve success with any given activity. Practice involves effortful striving toward a very specific goal where the level of difficulty exceeds the current skills and where feedback is desired, most often, from coaches and/or teachers. Students who are motivated to routinely practice for long periods of time are more likely to achieve success. These individuals are thought to demonstrate grit.

In the late 19th century, Galton (1892) collected biographical information about an eclectic and successful group of individuals, including judges, scientists, poets, musicians, painters, athletes, and others. Through this research, Galton (1892) concluded that success did not result from ability alone but, rather, resulted from a combination of "ability, zeal, and a capacity for hard labor" (p. 33). Later, when analyzing the biographies of 301 eminent creators and leaders and when rating these geniuses on 67 character traits, Cox (1926) identified the existence of three childhood traits that predicted lifetime achievement: "persistence of motive and effort, confidence in their (own) abilities, and great strength or force of character" (p. 218). Inspired by the unique attributes of people who achieve success, Duckworth, Peterson, Matthews, & Kelly (2007) defined grit as "the perseverance and passion for long-term goals" (p.

1087). Duckworth et al.'s (2007) research included populations who have achieved success in various areas of interest, including West Point Academy trainees and first-round contenders at the National Spelling Bee (Duckworth et al., 2007), retainees in the U.S. Special Forces, graduates of the Chicago school system, successful sales agents (Eskreis-Winkler, Duckworth, Shulman, & Beale, 2014), and high-performing novice teachers (Duckworth, Quinn, & Seligman, 2009; Robertson-Kraft & Duckworth, 2014). In each study, the authors noted that grit correlated positively with the participants' lifetime achievement over and beyond the domain-relevant talent measures, such as IQ, SAT scores, or standardized achievement-test scores, and physical fitness.

Critics of grit and the widely popular Grit Scale have questioned the validity and hierarchical structure of grit as well as whether grit provides anything new that factors, such as conscientiousness one of the Big Five Personality Traits (Poropat, 2009, 2014) and emotional intelligence (Perera & DiGiacomo, 2013), have not already established. Others suggest that Duckworth and her colleagues' work values repetitive mastering of a skill over a long time period at the expense of exploration and imagination, particularly at early ages when students should be encouraged to be creative (Duckworth, Peterson, Matthews, & Kelly, 2007; Duckworth, Quinn, & Seligman, 2009; Duckworth, Weir, Tsukayama, & Kwok, 2012). These critics posit that research on grit promotes an ideal that finishing what you started, despite the obstacles, leads to success and that such attitudes and focus may be contrary to leading a life that is happy and fulfilling, promotes creative opportunity, and results in ideal psychological health (Krohn, 2014).

The Grit Scale uses a two-factor model, measuring for consistency of interests, and perseverance of effort over extended time periods. Duckworth et al posit that people who

demonstrate the ability to overcome initial failures in their desire to achieve a particular outcome and who are motivated to consistently put in the time it takes to achieve mastery are more likely to successfully achieve their desired outcome. The authors suggest that both factors can be calculated by using the two primary self-report inventories to measure grit: the Grit Scale (Duckworth et al., 2007), and the Short Grit Scale (Grit-S Scale) (Duckworth, et al., 2009). Recently, some academic researchers have questioned the Grit Scale's validity, particularly the use of a single overall score as a measure of grit, and the score's use as a predictor of academic performance.

In their early discussion about the two factors associated with grit, Duckworth et al. (2007) reported that neither factor was consistently more predictive of outcomes than the other and suggested that the factors, together, were more predictive of positive outcomes. Others have criticized the use of a single factor, citing concerns related to the theoretical higher-order factor structure upon which such conclusions were drawn.

Using an online sample of 1,554 adults over 25 years of age, Duckworth, et al (2009) validated the Grit-S scale, using confirmatory factor analysis. Both a consistency of interest and perseverance of effort were first-order latent factors that were loaded on a second-order factor, grit. Each one of the two first-order factors was loaded on the higher-order factor of grit, with 0.62 for consistency of interest and 1.3 for perseverance of effort. The claimed support for the higher-order structure was based on findings suggesting that the higher-order structure (comprised of two first-order factors and one second-order factor) exhibited a significantly better fit than a single-factor model, a conclusion that was not supported with the original model (Duckworth, et al. 2007). Such a conclusion, it has since been argued however, would require additional testing to load the first-order factors onto the higher-order factor in order to

distinguish between the higher-order model and a model with two correlated factors (Crede, Tynan, and Harms, 2016). The authors reveal however, that Duckworth, et al. did not impose the type of equality constraints on the loadings of the first-order factors onto the higher-order factors that would be required to achieve identification because they reported non-identical loadings on the first-order factors onto the second-order factor (Crede, Tynan, & Harms, 2016).

In their meta-analytical estimate of the relationship between perseverance and consistency, Crede, Tynan, & Harms (2016) noted a generally strong relationship ($p=.60$) and an even stronger relationship when using the short Grit Scale ($p=.66$). The relationship grit had with intention to persist in college and with current employer was $p=.18$. The authors noted, however, that the perseverance of effort factor for grit exhibited much stronger relationships with academic performance than the consistency of interest factor, noting significant differences for the correlation coefficients ($p<.001$). In fact, perseverance of effort correlated at $p=.26$ for overall academic performance while consistency of effort correlated at $p=.10$ (Crede et al., 2016). Such results suggest the importance of continued research of grit as a predictor of persistence, particularly as it relates to the relationship that grit has with other variables such as motivation and engagement in the academic setting.

Of particular interest to many critics, grit exhibited a strong relationship with conscientiousness ($p=.84$), self-control ($p=.72$), emotional stability ($p=.41$), self-efficacy ($p=.43$) and mental toughness ($p=.42$), suggesting that grit adds very little to the discussion and is little more than a case of “old wine in a new bottle”. Crede, Tynan, & Harms, (2016) recognized, however, that grit did predict retention approximately as well as the more traditional cognitive predictors, suggesting to continue studying grit in settings where retention is problematic, such as higher education because incremental improvements to retention could result in thousands of

additional college graduates. The authors also suggested more studies about various moderators of grit, including the effect of one's individual level of grit and the degree to which scores for the grit measures are related to scores for the measures of motivation. The authors suggested a greater focus on the perseverance factor of the overall scale (Crede et al., 2016).

In summary, persisting to graduation, thereby achieving academic success, takes sustained effort over a long period of time. As mentioned earlier, students who desire to graduate from college are motivated to engage in activities that are perceived to promote success. Sustained effort over long periods of time is the unique attribute of students with grit; consequently, one would logically deduce that motivation is an integral prerequisite or co-requisite for students with grit. Students who are motivated to successfully complete their degree are more likely to engage in educationally purposeful activities and to persevere through the peaks and valleys that occur along the way if they perceive that such sustained efforts will contribute to their desired outcome.

Student-Athletes

Because student-athletes face challenges that are different from the traditional student population, Sedlacek, (2004) and Sowa and Gressard (1983) conceptualized student-athletes as nontraditional students. As a group, athletes tend to spend a significant amount of time together, and they share common goals and values as a result of similar experiences. In earlier studies, Engstrom and Sedlacek (1991, 1995) reported that athletes often face prejudice and discrimination similar to what is experienced by minorities, noting that other students and faculty tend to have a negative stereotype of student-athletes. In their desire to examine the attitudes of faculty towards male revenue and non-revenue student-athletes, Engstrom and Sedlacek (1995) concluded that the surveyed faculty held prejudicial attitudes and stereotypes towards both

revenue and non-revenue student-athletes, and regarded the athletes' academic abilities less positively than other students.

In their survey of student-athletes from 18 National Collegiate Athletic Association (NCAA) Division I Football Bowl Subdivision (FBS) universities, Potuto and O'Hanlon (2006) reported that student-athletes felt that their experience as a student-athlete contributed positively towards their development and overall college experience. The authors noted, however, that the student-athlete felt he or she had to make tradeoffs when it came to their academic and athletic commitments. The surveyed student-athletes reported that they had less time at home visiting family, had less time for curricular and co-curricular activities, believed that their professors discriminated against them and did not care if they graduated, and felt that their participation in athletics adversely affected their cumulative GPA. As a result of the research, these authors suggested that student-athletes are a unique and special population on college campuses, therefore warranting special study.

Intercollegiate athletics has been around for over 160 years, and has become a natural extension of what we have come to know and expect from institutions of higher education. The significance that athletics plays for large and small schools continues to become greater and more complex. In fact, there are over 520,000 student-athletes competing at the NCAA and NAIA level on college campuses today (NCAA Membership Report 2015, NAIA Guide for the College Bound Student-Athlete, n.d.). Consequently, several groups, such as the Faculty Athletic Representatives Association, the American Association of University Professors, the Knight Commission on Intercollegiate Athletics, and the Drake Group, have encouraged faculty involvement to reform the collegiate experience for student-athletes. Befittingly, the Collegiate Model of Athletics was established in 2013 to impart two principles: (a) to note that the athletes

who participate in college sports are students and (b) to recognize that intercollegiate athletics is embedded in higher education's values and mission. Unlike the professional model of athletics where the goal is to generate revenue through entertainment, the Collegiate Model of Athletics reminds us that the goal of collegiate athletics is to provide an education, including learning the value of hard work, teamwork, self-sacrifice, self-discipline, resilience, and the pursuit of excellence (Southhall, 2012). Therefore, it behooves us to continue studying this unique population of students whose goals and commitments may differ from the general student population both from student-athletes' perspectives as well as from the perspectives of individuals at the institutions the students represent.

From a national perspective, compiling college athletes' graduation rates became a priority through the Federal Graduation Rate (FGR) established by the Department of Education in 1990 as a result of press coverage highlighting the fact that 76% to 92% of professional athletes lacked college degrees and revealing that some of them were functionally illiterate (Nyad, D. NY Times, 1989). This Department of Education initiative has led to a period of academic reforms that were initiated by the National Collegiate Athletic Association (NCAA) and the National Association of Intercollegiate Athletics (NAIA) in an attempt to ensure the academic integrity of the organizations and their student-athletes. As a result, institutions are required to measure the retention and eligibility of either scholarship student-athletes or, if the institution does not offer scholarships, recruited student-athletes on a semester-by-semester basis. Penalties for institutions that do not have student-athletes persisting towards graduation can be severe and include such sanctions as a reduced number of scholarship opportunities availed to student-athletes in the future as well as a suspension from post-season tournament possibilities. Each penalty can result in reputational and financial loss for the entire university.

It is worth noting that, as a result of these academic reforms, many institutions have reported success with the number of student-athletes who are graduating. According the NCAA (2011), the latest Graduation Success Rate showed that 84% of Division I student-athletes who entered college in 2007 graduated, the highest rate ever. In fact, the report indicated that Division I student-athletes (those athletes competing at the highest level of competition within the NCAA) outperformed their peers in the general study body by 1% using the Department of Education's Federal Graduation Rate (FGR). The report noted that the FGR for Division I student-athletes was 66%, compared to 65% for all Division I students. Unfortunately, the same cannot be said for certain subsets of the athletic population, particularly for students participating in football, men's basketball, and baseball where players continue to graduate at lower rates than their peers (Southall, 2012). Although well-intentioned, solely increasing the academic requirements does not motivate student-athletes to achieve academically. Nearly 40% of NCAA Division I men's basketball players, for example, transfer before their junior year in search of more playing time, to be closer to family, or because they are not making it academically (NCAA, 2012). Additionally, women's basketball scores have shown a decrease over the last several years. Similar inconsistencies with the Graduation Success Rates are noted for both male and minority student-athletes. Therefore, gender, race/ethnicity, and the sport type are factors that should be examined when considering student-athletes' academic and athletic persistence.

Persistence and Success for Student-Athletes

Student persistence is defined as the students' actions and individual-level goal attainment in his or her pursuit of degree completion. Factors that contribute to the successful attainment of degree completion are often discussed as either cognitive and demographic factors, or non-cognitive factors. For student-athletes, the factors that are posited to predict success are

likely to be different due to the uniquely different experience they may have as they seek success both academically and athletically, simultaneously. Below is a discussion of the cognitive and non-cognitive factors of interest in this study as they relate to this unique population of students.

Cognitive Factors and Student-Athlete Persistence

Over the years, several scholars have studied high-school GPA, positing that it is a significant predictor of a student-athlete's college GPA for both White and Black student-athletes (Astin, 1993; Bryson, Smith, & Vineyard, 2002; Comeaux, 2005; Sellers, 1992; Young & Sowa, 1992). Studying student-athletes as a unique subset of the population by utilizing data from the Cooperative Institutional Research Program (CIRP), Comeaux (2005) noted that high-school GPA had a substantial, positive relationship with future college success. In contrast, Petrie and Russell (1995) studied the effects that academic and psychosocial variables have on the academic performance of college-football student-athletes, concluding that standardized test scores alone could not explain academic performance when considered with other non-cognitive variables. Later, Sadlacek and Adams-Gaston (1992) concluded that SAT scores did not predict first-semester grades for freshman athletes. The authors suggested that universities would be doing their student-athletes a disservice if they used SAT scores to prevent a student-athlete from playing in his or her first year. In earlier studies, Tracey and Sedlacek (1984, 1989) measured the relationship of eight non-cognitive variables with the academic performance of nontraditional students in higher education, noting that the non-cognitive variables predicted freshman grades, upper-class grades, retention, and graduation for nontraditional students.

With the passage of the academic reform movement, the NCAA has instituted a sliding scale in order to determine a student-athlete's ability to receive an athletic scholarship and to be eligible to play his or her sport as a freshman. The sliding scale considers a combination of both

high-school GPA and the student-athlete's ACT/SAT score. The result allows a student-athlete with a better high-school GPA and a lower ACT/SAT score, or vice versa, to be eligible to receive an athletic scholarship and to participate during his or her first year. This sliding scale, however, has been widely criticized for giving institutions the flexibility to admit underprepared student-athletes. In *The Game of Life* (Shulman & Bowen, 2001) and *Reclaiming the Game* (Bowen & Levin, 2003), the authors noted that, for institutions in the two conferences studied, the recruited student-athletes' ACT scores were significantly lower than the scores for non-athlete counterparts; additionally, student-athletes were up to four times more likely to get into their chosen schools than non-athletes. The authors also found that these student-athletes earned lower grades in college than their classmates who had similar entrance-exam scores and that students in high-profile sports performed worse than students in low-profile sports. Therefore, it is important to continue exploring the non-cognitive factors that are related to the student-athletes' desires, attitudes, and behaviors which may better predict persistence and degree completion for this unique subset of the population.

Demographic Factors and Student-Athlete Persistence

Studying the relationship between athletic participation and academic achievement for college freshmen, Pascarella, Bohr, Nora, and Terenzini (1995) found that intercollegiate-athletic participation had a significant, adverse effect on general cognitive development for both male and female student-athletes during their first year of college, although the effect was less for women. The authors also noted that student-athletes playing football and men's basketball experienced declines for their math and reading scores while student-athletes competing in various other sports experienced gains. These results were consistent with an earlier study conducted by Eitzen (1988) who reported that athletes in the men's revenue-generating sports of

football and basketball did not perform as well as other athletes when it came to grades and graduation rates.

Harper, Williams, and Blackman (2013) reported that 96.1% of the 76 institutional members of the country's 6 largest NCAA Division I athletic conferences graduated Black, male student-athletes at rates lower than other student-athletes. Across the 4 years studied (2007-2011), only 50.2% of Black, male student-athletes graduated within 6 years, compared to 66.9% of student-athletes overall.

Pascarella et al. (2004) found that first-generation college students who played varsity sports were at a greater disadvantage than their peers whose parents had attended college. After studying NCAA Division I student-athletes at four year colleges, Sellers (1992) found that family SES was associated with academic success; student-athletes from higher SES families were more likely to experience academic success than those student-athletes from lower SES families. Numerous other sources, such as Horn et al. (2001) and Hrabowski (2002), later concluded that Black student-athletes in football and men's basketball come from families with lower SES backgrounds, and are not as academically prepared for college as their White teammates. Finally, in his study of academic and athletic motivation, and balance of student-athletes at a successful NCAA Division I program, Althouse (2007) found that the parents' level of education was a significant predictor of Balance Score ($p < .05$). The author suggested that student-athletes whose parents completed college may understand and support the notion that the future of their children depends more on their ability to perform in the classroom than their skills on the playing field.

In summary, numerous studies exist to support the general notion that cognitive and demographic characteristics, such as high-school GPA, ACT/SAT scores, and high-school

academic preparation, as well as family socio-demographic traits, such as gender, race/ethnicity, and SES, are positively related to both general students' and student-athletes' persistence and academic success in college. Although recent research often considers such factors as confounding variables, evidence suggests that a relationship exists between these factors and a student's likelihood to persist in college (Peltier, Laden & Montra, 1999; Reason, 2003). For student-athletes, Adams-Gaston (2009) and Sedlacek (2004) found that student-athletes presented more like nontraditional students; non-cognitive factors were better predictors of athletes' grades than were SAT scores. As stated earlier, Sedlacek (2004) went on to boldly state that SAT scores should not be used to select or to predict the early success of student-athletes, going so far as to say that utilizing student-athletes' SAT scores to deny athletes the right to compete during their first year would be a great disservice.

Due to the implications that this research could have on various subsets of the student-athlete population, these factors were considered by examining the mean differences between subgroups within the student-athlete population.

Non-Cognitive Factors and Student-Athlete Persistence

As noted earlier, non-cognitive attributes of a student enrolled in higher education are considered to be the personal actions, attitudes, and behaviors of the student that contribute to his or her persistence through college and, ultimately, to successful degree completion. Below is a discussion of the three specific factors of interest for this study: Motivation, engagement, and grit as they relate to student-athletes.

Motivation and student-athlete persistence. In Gaston (2002) efforts to develop a survey to measure the relationships between student-athletes' motivation towards sports and academics and student-athletes' success in college, the author posited that cognitive

achievement-motivation theories, such as expectancy-value theory, self-efficacy theory, and attribution theory, were useful to measure academic and athletic motivation. Achievement-motivation theories have a basic assumption that motivation towards a specific task is determined by an individual's choice, persistence, and effort applied to a task (Weiner, 1985). Theoretically, a student-athlete who is motivated to approach a specific task would exert significant energy and time towards successfully completing that task.

The SAMSAQ is used to determine the student-athlete's motivation on two levels: Student Athletic Motivation (SAM), and Academic Motivation (AM). The Academic Motivation subscale (AM) measures the extent to which a student-athlete is motivated towards academic-related tasks and the student-athletic motivation subscale (SAM) measures the extent to which the student-athlete is motivated by his or her sport (Gaston-Gayles, 2005). Each subscale, therefore, measures the extent to which student-athletes are motivated towards the related tasks. A higher score indicates a higher degree of motivation.

Somewhat unique to student-athletes is their aspiration to play their sport professionally beyond college. Especially for student-athletes in high-profile sports such as football, baseball, and men's and women's basketball, student-athletes may be motivated by the desire to continue playing their sport professionally and, therefore, are not entering college with the goal of actually obtaining a degree. Table 1 represents the estimated probability of competing in athletics beyond the high-school interscholastic level as presented by the NCAA (NCAA, Probability of Competing Beyond High School, 2013) and modified to exclude men's ice hockey and men's soccer. Although many student-athletes may enter college with the goal of playing their sport professionally, the reality is that most will not.

Table 1

Estimated Probability of Competing in Athletics Beyond the High-School Interscholastic Level

Student-Athletes	Men's BB	Women's BB	Football	Baseball
High-School Student-Athletes	538,676	433,120	1,086,627	474,791
High-School Senior Student-Athletes	153,907	123,749	310,465	135,655
NCAA Student-Athletes	17,984	16,186	70,147	32,450
NCAA Freshmen Roster Positions	5,138	4,625	20,042	9,271
NCAA Senior Student-Athletes	3,996	3,597	15,588	7,211
NCAA Student-Athletes Drafted	46	32	254	678
Percent High School To NCAA	3.3%	3.7%	6.5%	6.8%
Percent NCAA to Professional	1.2%	0.9%	1.6%	9.4%
Percent High School To Professional	0.03%	0.03%	0.08%	0.50%

Note: These percentages are based on estimated data and should be considered approximations of the actual percentages. Last Updated: September 24, 2013

The information presented in Table 1 suggests that only 46 NCAA men's basketball players, or 1.2% of the total participants, were drafted to play professionally; 32 NCAA women's basketball players, or 0.9% of the total participants, were drafted to play professionally; 254 NCAA football players, or 1.6% of the total participants, were drafted to play professionally; and 678 NCAA baseball players, or 9.4% of the total participants, were drafted to play their sport professionally. Many drafted baseball players begin their professional careers in the minor league system; only 1 in just over 9 of those players (9.4%) ultimately play Major League

Baseball (Sorenson, 2015). Combined, 1,010 student-athletes of a possible 136,767 NCAA collegiate-level participants, or 0.74% achieved their dream of playing athletics professionally. Such statistics provide overwhelming evidence to support the importance of providing the adequate academic, sporting, and social environments that are necessary to help student-athletes succeed academically and athletically.

Engagement and student-athlete persistence. As previously noted in their extensive research about student retention, Pascarella and Terenzini (2005) noted that persistence was largely determined by a student's involvement inside and outside the classroom, suggesting that the more intensely students engage with their college environment, both academically and socially, the greater the potential for satisfaction; achievement; and, thus, persistence. Perhaps no single student population on a college campus could be considered more engaged in the institution's social (extracurricular) systems than student-athletes. While studying the student-athletes' motivation and engagement, Gaston-Gayle and Hu (2009) confirmed that, regardless of race, major, and sport profile, student-athletes are equally as likely to engage in their institutions as non-athletes.

In an earlier study, Ames (1992) suggested that educational and athletic domains are very similar and promote the development of motivational behaviors in similar ways. When controlling for pre-college characteristics, Astin (1993) and Pascarella (1996) found that athletic participation was positively associated with satisfaction towards degree completion, persistence, and graduation rates. Studying the effects of engagement on first-year students' grades and persistence, Kuh, Cruce, Shoup, Kinzie, and Gonyea (2008) concordantly reported a relationship between student-athletes' engagement and first-year grades, noting that a student-athlete's engagement positively impacted his or her persistence from the first year to the second year.

As noted earlier, Vincent Tinto (1975) introduced the importance of student integration and engagement as they relate to student persistence. Tinto introduced a theoretical model that included students' expectational and motivational attributes, suggesting that a student's educational- and institutional-goal commitments were important predictors for the manner in which he or she interacted with the college environment and, therefore, contributed to the persistence differences. Terenzini and Wright (1987) examined college students' academic and social integration, noting that the amount of time students spent participating in these activities had a direct and positive effect on their academic skill development. Academic and social integration was later defined by Nora and Cabrera (1993) as the development of a strong affiliation with the college environment both inside and outside the classroom, suggesting that academic integration related to a student's interactions in class while social integration related to the informal relationships that a student develops outside the classroom.

Expanding on this model, Comeaux and Harrison (2011) proposed a conceptual model that offers a culturally inclusive approach for influencing student-athletes' academic success. As shown in Figure 1, this model is primarily based on a set of individual characteristics and dispositions, with effects from the social and academic systems within which the student-athlete operates. These systems, as well as the initial commitments that motivate student-athletes' engagement within the systems, and, therefore, the student-athletes' ultimate academic success are explained in the following paragraphs.

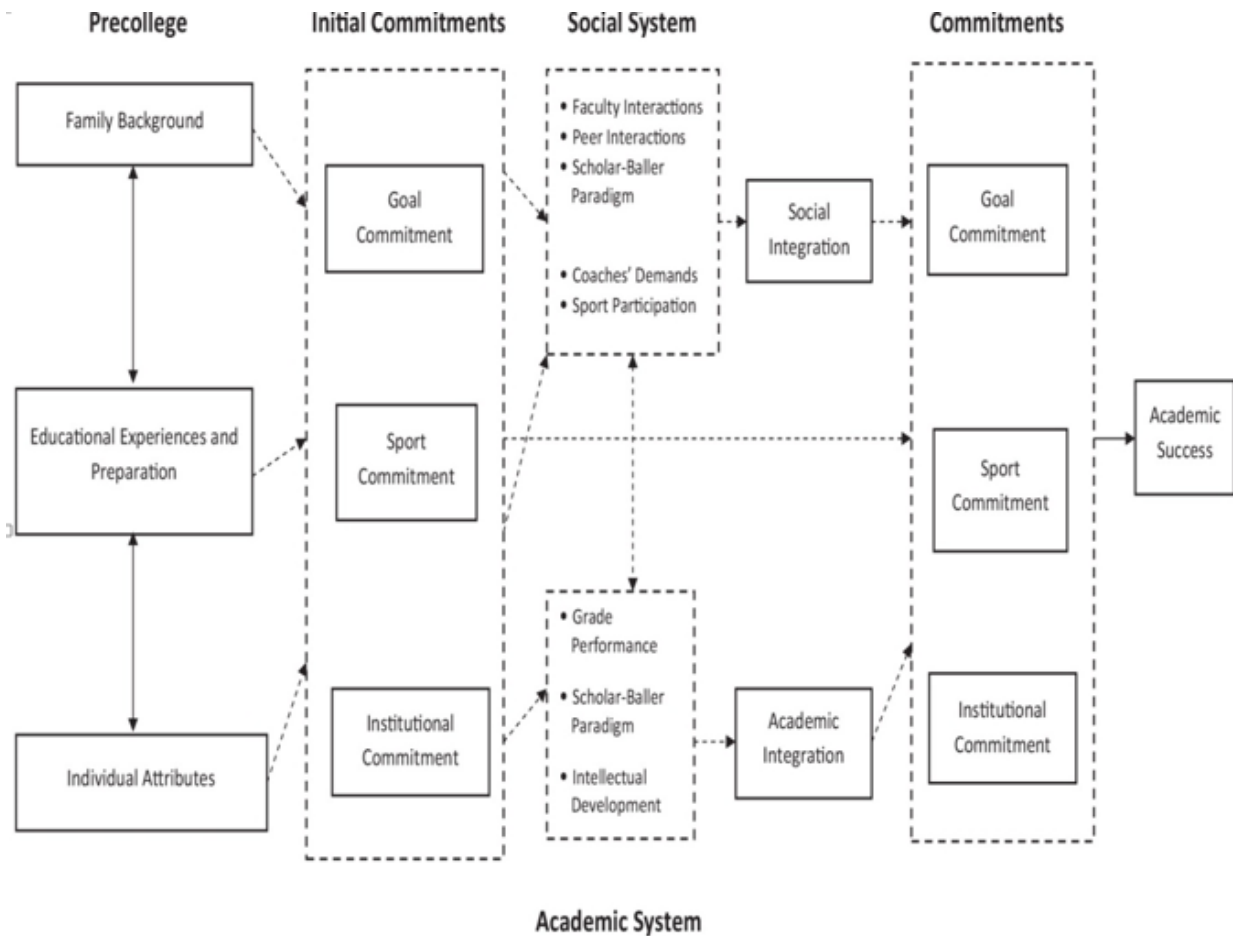


Figure 1. Model for college student-athlete academic success. Adapted from Comeaux and Harrison (2011, p. 238).

Academic Integration and Institutional Commitment of Student-Athletes. Institutional commitment determines the level of academic integration that a student-athlete experiences at his or her institution. Comeaux & Harrison (2011) defined institutional commitment as a “student-athlete’s expectation of satisfaction with the institution, and the degree of importance ascribed to completing his or her undergraduate degree at the institution” (p. 238). This variable considers the student-athlete’s level of success in the classroom, his or her commitment to the institution of choice and to earning a degree, as well as his or her intellectual development. Academic integration influences institutional, goal, and sport commitment, therefore affecting academic success. In their review of the scholarly literature related to student departure, Pascarella and

Terenzini (2005) revealed a general consistency with the findings, noting that “students’ institutional commitments exert an important and positive effect in shaping their persistence decisions, both planned and actual” (p. 426). The authors, again, posited that a student’s level of involvement, both academically and socially, is related to persistence.

In another study addressing the psychosocial factors that relate to student-athletes, Downey (2005) found that Division I freshmen were significantly less committed to earning a degree than non-athlete freshmen. In this study, the author noted a decline in both the student-athletes’ academic and emotional adjustment as well as their integration during their first semester of college when compared to non-athletes. Consequently, these athletes had a greater risk of not graduating from their chosen institutions. Earlier research related to gender differences for student-athletes’ motivation to achieve academic success in college often revealed that female athletes tend to be more interested in their academic achievements than the male student-athletes are (Gaston, 2002, 2004; Lantz, Etzel, & Ferguson, 1996; Pascarella & Smart, 1991; Simons, Van Rhee, & Covington, 1999). As these authors studied student-athletes’ psychosocial development, they found that female student-athletes were more engaged in their academic development than their male counterparts.

Exploring the development of 361 student-athletes, Simons et al. (1999) studied the relationship of a student-athlete’s motivational orientation to his or her academic performance and identification, noting that female student-athletes were less likely to attend college purely for athletic reasons. Gaston (2002), and later Gaston-Gayles (2004), determined that participating in college sports was modestly related to the motivation to complete a college degree, and that participation was attributed mainly to female athletes and those athletes who had determined their major of study. The author noted that female athletes at a large NCAA Division I program

scored higher on the Academic Motivation scale of the Student Athletes' Motivation Toward Sports and Academics Questionnaire (SAMSAQ) than their male counterparts did.

Social Integration and Sport Commitment of Student-Athletes. Sport commitment is the amount of physical and psychological time and energy that a student-athlete devotes to his or her sport. Athletes spend an enormous amount of time practicing, competing, traveling, and volunteering as obligations of being on the team. In Jacobs 2015 survey, male student-athletes reported spending, on average, 41.6 hours per week on their sport while in season while women spent 33.3 hours per week on their sport during the season. In a recent attempt to unionize, Northwestern University football players documented a yearly average of 36 hours per week that were spent on activities related to their sport. Therefore, the greater the level of commitment to one's sport, the less engagement in other extracurricular activities the athlete is likely to enjoy.

Stevenson (1999) suggested that elite athletes develop a commitment to sport participation as they establish personal reputations and identities as athletes. In this study, the author noted that, the more respect and validation student-athletes receive for their athletic success, the more committed they become to their sport. In a longitudinal qualitative study of male basketball players at a successful Division I institution, Adler and Adler (1991) chronicled the transition that elite athletes experience as they progress through their four years of athletic eligibility. With this study, the authors used role theory and the social psychological theory of symbolic interactionism to examine the relationships among the individual, society, and social trends. Adler and Adler's observations revealed a "significant pattern of transformation among all the participants: *role engulfment*" (p. 27). Although these athletes entered college optimistic about achieving their academic aspirations, after only a few short semesters, the student-athletes began to devalue their academic goals as they became more absorbed by their sport's demands.

Because athletes are at risk of forfeiting their personal development to meet the specific demands of their sport, Petitpas (1978) found that student-athletes risk committing to their athletic roles at the expense of exploring other areas of university life that can have a positive impact on academic success and persistence. Because of the hyper-competitive nature of collegiate athletics, athletes often believe that athletic success should be their primary focus; consequently, student-athletes feel exploited by their university, are less connected to the outside community, and are even resented by their non-athlete peers (Pinkerton, Hinz, & Barrow, 1989; Watston & Kissinger, 2007). These negative reactions can result in academic, social, and emotional struggles for the student-athletes, ultimately delaying or inhibiting the students' persistence.

Controlling for potential confounding variables, such as pre-college test scores, Pascarella, Bohr, Nora, and Terenzini (1995) found that male participants for the intercollegiate revenue-producing sports of football and basketball performed at a lower level than their non-athlete peers and the athletes of other non-revenue-producing sports when given end-of-year reading-comprehension and math assessments. In follow-up studies that essentially utilized the same research design, the scholars went on to conclude that such learning disadvantages continued and became more pronounced as these student-athletes entered their second and third years of school (Pascarella et al., 1999). Such results contribute to the notion that, as students become more motivated to achieve success athletically, they often do so at the expense of their academic and social growth.

Using a nationally representative sample of student-athletes and controlling for pre-college characteristics and initial degree aspirations, Briggs (1996) found that, after four years, football and basketball players had significantly lower degree aspirations, thus achieving lower

persistence rates than student-athletes who played other intercollegiate sports. This finding was contradicted by Shulman and Bowen (2001) who examined athletes' successes at academically selective institutions. In their study of athletes and non-athletes at 30 academically selective institutions, Shulman and Bowen found that athletes graduated at higher rates than their non-athlete peers. In addition, the authors noted that these athletes also graduated at rates that were higher than the national average for collegiate athletes. Finch and Gould (1996) suggested that helping student-athletes maintain a healthy balance between their sport and other activities that are associated with the college experience is important in order to help students to succeed in college and, ultimately, to achieve degree completion.

Social Integration and Goal Commitment of Student-Athletes. Goal commitment determines the student-athlete's level of social integration. Goal commitment considers both the levels of integration as well as the extent to which the individual and his or her social environment are in sync. Social integration involves informal interactions with other non-athlete students or groups on campus, participation in co-curricular activities, and informal interactions with faculty and other administrative. After controlling for students' pre-college characteristics as well as various institutional characteristics, Astin (1993) found that student-faculty interaction had a significant, positive correlation with college GPA, degree attainment, graduating with honors, and enrollment in graduate or professional school. More recently, Gayles and Hu (2009a) determined that student-athletes' relationships with classmates other than their teammates had a positive impact on the student-athletes' personal self-concept as well as on the student-athletes' learning and communication skills.

Using a modified Delphi technique, Kelly, Lavergne, Boone, and Boone (2012) discovered that positive course experiences, relationships with professors, and family

encouragement were the most agreed-upon social factors that encourage student persistence. The authors also noted that burnout, a lack of time management, and the inability to handle stress discouraged student persistence, phenomena that one might expect to describe and impact student-athletes. In a national study of 18 Division 1A schools, Potuto & O'Hanlon (2007) found that student-athletes regard their sport participation as highly positive; the student-athletes believed that they had learned values and skills through participation in athletics that they did not get from other college experiences. Other studies reported similar positive perceptions, finding that participation in intercollegiate athletics was positively related to increased self-esteem, confidence, athletic performance, and social networks (Brewer, Van Raalte, & Linder, 1993; Horton & Mack, 2000).

Colleges and universities that are affiliated with the NCAA and the NAIA are required to provide student-athletes with academic support services. Although these obligations ensure that athletes receive the resources they need to be successful in the classroom, individual athletic programs tend to offer these services within the confines of the team setting, often requiring student-athletes to attend a mandatory study table together or to meet with individual team tutors. The consequence of such activities keeps a student-athlete from interacting with non-athlete students, contributing to the concern that student-athletes are less likely to participate in non-athletic, socially engaging activities that could promote a greater connection to the campus and, thus, could lead to a greater motivation to persist. In his research, Benford (2007) concluded that the special treatment some athletes receive from special tutors, advisers, and student-athlete service departments can serve as a de-motivator, creating a sense of academic helplessness.

As noted, both academic and social integration with the campus community increases the likelihood that a student-athlete will persist in college. How students negotiate and respond to

ideas, values, and behaviors that are different from that which they are familiar is critical to their individual maturation and, ultimately, to their ability to persist to degree completion. The time demands for participating in collegiate athletics often exceed 40 hours a week when considering practice time, travel time, time spent in the training room, and the mandatory study table. Such demands significantly limit student-athletes' opportunities both inside and outside the classroom. When student-athletes have limited time available to network with various people throughout the campus and to navigate through the multitude of academic and developmental resources that are available to them, their opportunity to become more deeply engaged in the campus community is forfeited. These limitations create natural barriers for academic and social development that have the potential to positively impact student-athletes' persistence to degree completion.

Grit and Student-Athlete Persistence. Adding a slight twist to the motivation and engagement theories, Duckworth et al. (2007) utilized an expectancy-value framework and achievement-goal theory to introduce the concept of grit. Duckworth et al. (2007) suggested that successful outcomes are derived from something other than cognitive ability. Their research considered numerous cohorts of individuals who were thought to have achieved success, such as West Point military cadets, national spelling-bee contestants, and long-term married couples. Grit, the authors concluded, was related to persistence among all cohorts tested, suggesting that achieving difficult goals entails not only talent, but also the sustained and focused application of talent over time. The authors noted that an individual who possesses grit is more likely to persevere through various peaks and valleys in order to successfully reach a desired outcome.

More recently, Von Culin, Tsukayama, and Duckworth (2014) posited that individual variations in one's tendency to pursue long-term goals with passion and perseverance are derived, in part, from his or her individual motivational differences. In this research, the authors

tested relationships between grit and approaches to happiness in life using Seligman's (2002) multi-faceted construct of well-being: pleasure, engagement, and meaning. Von Culin et al. suggested that individuals who are motivated by engagement in flow-producing activities, or people who have highly challenging or highly skilled activities that are likely to require a state of complete absorption and full mastery (Von Culin, et al, 2014) are more likely to sustain effort towards long-term goals. The study revealed that the association between engagement and grit was significantly greater than the association between meaning and grit ($p < .001$) which, in turn, was significantly greater than the association between pleasure and grit ($p < .001$). The authors noted that engagement seemed to facilitate sustained effort over time and suggested the importance of future research targeting the particular motivations underlying one's perseverance of effort and consistency of interest (Von Culin et. al., 2014), further supporting the importance of studying the proposed three constructs together in one model.

As the authors suggested, "grit" is a term that is used to define an individual's inclination to pursue a goal over very long periods of time. Based on extensive utilization of an eight-question survey that they developed known as the Grit-S Scale, it is the authors' position that goal commitment is a function of a perceived benefit (in terms of instrumental importance or intrinsic interest), costs (including opportunity costs), and the likelihood of realization, positing that gritty people perceive the importance and interest of their goal to be extremely high, the costs of attainment acceptable, and the likelihood of realization high (Von Culin et al., 2014). Recent studies have demonstrated a relationship between high grit scores and success among teachers, cadets at the U.S. Military Academy, National Spelling Bee contenders, Ivy League undergraduates, and numerous others. Jaeger, Freeman, Whalen, and Payne (2010) studied grit for engineering students at Northeastern University, and although not the focus of their research,

the authors found that student-athlete engineers exhibited more grit than non-athlete engineering students. Due to its relatively new introduction, research related to grit and the persistence of student-athletes is limited, suggesting the need to study this unique population of students, particularly, the relationship that grit has to the previously studied factors of motivation and engagement in educationally purposeful activities.

Although student-athletes make a choice to continue playing their sport while attending college, it is likely that each student-athlete has different goals and commitment levels when it comes to his or her motivation for wanting to continue playing. In her research, Gaston (2002) defined motivation as “the degree to which a student-athlete is energized toward exceling in their [*sic*] academic or athletic tasks” (p. 21). As Ryan and Deci (2000) suggested, people exhibit varying degrees of energy or motivation, depending on their unique goals and desires as well as the type of task at hand. The proposed research posits that motivation (or the lack thereof), which is considered within the three subscales identified by Gaston (2002, 2004), influences a student-athlete’s level of social and academic engagement as well as the sustained interest and perseverance that he or she is willing to commit over a long-term period, ultimately leading to persistence both academically and athletically. Tyson, Venville, Harrison, and Treagust (1997) suggested that behavioral indicators of motivation, including the decision to engage in a task, the level of involvement with the task, and the decision to continue at the task, are factors that contribute to learning. Current research on student-athlete persistence has neglected the motivational context and its potential relationship to the student-athlete’s willingness to engage in educationally purposeful activities over an extended period of time, ultimately resulting in the primary goal of college attendance: degree completion. This study’s outcome may become a significant part of the ongoing conversation among college officials, athletic departments, and

the NCAA and NAIA regarding college-admission practices and supporting the motivationally engaging, educationally purposeful opportunities that are offered to student-athletes.

Summary

Student-athletes' college experience is different from the general student population. Their unique needs, goals and expectations as a result of their bifurcated desire to achieve success both academically and athletically contributes to the need to study this population of students independently. By and large, college and universities select their entering classes based on cognitive factors such as ACT/SAT scores and high school GPA. Assessing a student-athlete's likelihood of success in college based solely on such cognitive measures limits the institution's ability to recruit and retain the student-athletes who may have the non-cognitive factors that can contribute to his or her ability to be successful in college. Previous research has demonstrated a relationship between non-cognitive factors such as motivation, engagement in educationally purposeful activities, grit and persistence for the general population of students, but very little research has been done to study these factors as they relate specifically to student-athletes. Therefore, this research is both necessary and timely. Considering the extensive costs associated with recruiting and retaining students and student-athletes alike, combined with the financial and societal implications of attrition, a study of the variables proposed in this study contributes to existing research related to factors influencing successful degree completion.

CHAPTER 3. METHODS

The MEGSA model (Figure 2) was proposed to explain the relationship between the three unique subsets of motivation and persistence for student-athletes, and the influence that engagement and grit have on this relationship.

To achieve the intended purpose, two major research questions guided this study.

1. Is there a relationship among student-athletes' motivation (as measured using three motivational subscales: Academic Motivation, Student-Athletic Motivation, and Career-Athletic Motivation, and Persistence, and do Engagement and Grit mediate that relationship?
 - A. Do Academic Motivation, Student-Athletic Motivation or Career-Athletic Motivation influence Persistence directly and indirectly through Engagement and Grit?
 - B. Do Engagement and Grit directly influence Persistence?
2. Do Academic Motivation, Student-Athletic Motivation, Career-Athletic Motivation, Engagement, Grit, or Persistence vary by gender, race, or sport?

Research Design

In order to answer the research questions, a predictive, correlational (multiple regression) design was used to produce descriptive information about the factors that were related to student-athletes' Academic Motivation, Student-Athletic motivation, Career-Athletic Motivation, Engagement, Grit, and Persistence. The student-athletes who participated in this study competed in one or more of the 17 athletic programs which were offered at a private, coeducational university in the Midwest. A hypothesized path model that depicted the interrelatedness of the variables was tested and compared to the results obtained with the three administered instruments. Direct and indirect predictors were investigated and the model was used to

demonstrate the strength of the relationships between the measured variables. Demographic data (gender, race, and sport) was compared for each variable by using multivariate analysis of variance (MANOVA) to look for significant differences. Variables were measured by administering three Likert-type instruments with demographic questions to all student-athletes at the university during fall, 2016.

Sampling Frame

All student-athletes on the varsity and junior varsity rosters for each of the 17 sports offered at the University who had completed a minimum of at least one semester of college were invited to participate in this study, thereby reducing the coverage error (Salant & Dillman, 1994). The University is a private, co-educational liberal-arts university with approximately 1,100 graduate and undergraduate students. It is ranked by the Carnegie Commission on Higher Education as a Comprehensive Baccalaureate University. The student-athletes compete as part of the National Association of Intercollegiate Athletics (NAIA) in the North Star Conference for all sports except hockey. Hockey, competes in the Division I American Collegiate Athletic Association hockey league.

Descriptive statistics were used to determine the sample characteristics, frequencies, percentages of male and female respondents, their race/ethnicity, and the sport in which the respondents participated. Table 2 contains demographic information for the sample n=186.

One hundred and eighty-six students completed the survey instrument. There were slightly more male (60.2%) than female students who participated in the study, with the majority of the respondents being White (83.3%).

Table 2

Frequencies and Percentages for the Demographic Variables (N = 571; n = 186)

Variable	Population		Sample	
	N	%	n	%
Gender				
Male	370	64.8	112	60.2
Female	201	35.2	74	39.8
Race/Ethnicity				
White/Caucasian			155	83.3
Other			31	16.7
Sport Played				
Football	108	18.92	20	10.8
Men's Soccer	31	5.43	4	2.2
Men's Track	34	5.95	4	2.2
Men's Golf	10	1.75	3	1.6
Men's Basketball	39	6.83	18	9.7
Men's Wrestling	34	5.95	8	4.3
Men's Baseball	79	13.84	35	18.8
Men's Hockey	35	6.13	19	10.2
Women's Volleyball	29	5.08	9	4.8
Women's Soccer	32	5.60	12	6.5
Women's Track & Field	40	7.01	12	6.5
Women's Golf	12	2.10	2	1.1
Women's Basketball	27	4.73	19	10.2
Women's Wrestling	30	5.26	10	5.4
Women's Softball	31	5.43	11	5.9

The sport with the largest representation was men's baseball (18.8%). Baseball, with 79 student-athletes, represents the University's second largest sport (football is the largest with 108 participants). The sport with the smallest representation of respondents was women's golf (1.1%). Women's golf, with 12 participants, represents the second smallest sport (men's golf is the smallest with only 10 participants).

Academic Measures

The respondents completed between seven and 149 credits. The mean number of credits completed was 58.68 ($SD = 39.44$), and the number of semesters completed ranged between one and nine semesters ($M = 3.38$, $SD = 2.36$). The GPA of the student-athletes who responded ranged from 1.27 to 4.00; the mean GPA was 3.15 ($SD = .54$).

Instrumentation

Three instruments were used to conduct this study including the 30-question Student-Athletes' Motivation toward Sports and Academics Questionnaire (SAMSAQ; Gaston, 2002), the 34-item Revised Institutional Integration Scale (French & Oakes, 2004, Pascarella & Terenzini, 1980), and the 8-question Short Grit Scale (Duckworth et al., 2007). These instruments, along with demographic data to be collected, are described below.

The SAMSAQ

This study utilized the Student-Athlete Motivation towards Sport and Academics Questionnaire (SAMSAQ) to measure the student-athlete's motivation for their two most prominent college roles: academics and athletics. The SAMSAQ was developed by Gaston (2002) to measure student athletes' academic and athletic motivation. The instrument was constructed from an expectancy-value motivation framework (Shuman, 2009). Achievement-motivation theories have a basic assumption that motivation towards a specific task is determined by an individual's choice of, persistence on, and amount of effort applied to a task (Weiner, 1985). Theoretically, a student-athlete who is motivated to approach a specific task would exert significant time and energy to successfully complete that task.

Exploratory factor analysis and reliability estimates were used to determine the underlying structure and internal consistency for the survey's questions (Browne, Cudeck,

Tateneni, & Mels, 1999). This analysis produces a measure of model fit as well as confidence intervals for model fit, standard errors for rotated factor loadings, and factor correlations. Although hypothesized to yield a two-factor solution (an academic-motivation factor and an athletic-motivation factor), two-, three-, and four-factor solutions were investigated. Gaston (2002) used the eigenvalue rule, the scree test, the root mean square error of approximation (RMSEA) values, and the interpretability of the items loading on each factor to determine the best-fit model. The rotated three-factor solution was chosen after determining that the RMSEA value was more acceptable than the RMSEA from the two-factor model. The resulting three-factor solution had a root mean square error of approximation (RMSEA) value of .069, and the 90% confidence interval was (.061, .077). Therefore, the SAMSAQ showed good internal consistency when measuring the three motivation constructs. The interpretability of and acceptable model fit for the SAMSAQ suggest that cognitive-motivation theories, such as expectancy-value, self-efficacy, and attribution, are useful to measure academic and athletic motivation.

The three factors that evolved from the initial survey instrument were the (a) Academic Motivation subscale, which measured the extent to which a student-athlete was motivated towards academic-related tasks (16 items); (b) Student-Athletic Motivation subscale, which measures the extent to which the student-athlete is motivated by his or sport (8 items); and (c) Career-Athletic Motivation subscale, which measures the student-athlete's desire to play sports at the professional or Olympic level (5 items; Gaston, 2002). Each subscale, therefore, measures the extent to which student-athletes are motivated towards each of the three related tasks. Scores for each subscale requires reverse coding for nine items (items 5, 9, 11, 17, 18, 21, 25, 26 and

30), summing the responses for each subscale, and calculating the mean score for each subscale. A higher score indicates more motivation.

The SAMSAQ is a 30-item instrument using a six-point Likert-scale ranging from 6 (*very strongly agree*) to 1 (*very strongly disagree*). Gaston (2002) measured reliability by calculating a Cronbach's alpha coefficient for each of the three subscales. Cronbach's alpha is a measure of internal consistency that determines inter-item consistency or homogeneity for the items on an instrument (Mueller, 1986). The coefficient ranges from .00 to 1.0, with scores closer to 1.0 indicating a more reliable measure. The reliability for the SAMSAQ was determined to be good for the Student-Athletic Motivation subscale ($\alpha=.86$), and for the Career-Athletic Motivation subscale ($\alpha=.84$). The reliability was determined to be fair for the Academic Motivation subscale ($\alpha=.79$).

The results of this study revealed that Cronbach's alpha for the three motivational constructs ranged from .79 for Student-Athletic Motivation to .80 for Academic Motivation and Career-Athletic Motivation. These results are considered acceptable at alpha greater than .70 (Nunnally & Bernstein, 1994).

The Institutional Integration Scale-Revised

The original Institutional Integration Scale (IIS) measured five facets of college students' academic and social integration. Academic integration referred to students' perceptions of academic performance and general intellectual development (Robinson, 2003), and social integration is the quality of students' relationships with both their peer group and their faculty. The scale was based on Tinto's model of college student withdrawal and contained 30 items measured with a 5-point Likert scale (1=*Strongly Disagree* to 5=*Strongly Agree*). The IIS had five subscales (a) Peer-Group Interactions (7 items), (b) Interactions with Faculty (5 items), (c)

Faculty Concern for Student Development and Teaching (5 items), (d) Academic and Intellectual Development (7 items), and (e) Institutional and Goal Commitment (6 items). Social Integration was measured by the Peer-Group Interactions, Interactions with Faculty, and Faculty Concerns for Students subscales. Academic Integration was measured with the Academic and Intellectual Development as well as the Institutional and Goal Commitments subscales (Pascarella & Terenzini, 1980).

The revised IIS model contains a 34-item instrument (French & Oakes, 2004) that has the five subscales developed by Pascarella and Terenzini (1980), but included four additional questions suggesting that the scale assess the levels of social and academic integration within two broader categories: Faculty and Student. The factor labeled Faculty suggests that students may have a sense of social and academic integration that is specific to the faculty with whom they have interacted during the first year. The second factor, Student, also assesses aspects of social and academic integration, but in relation to peers and the general university environment. The IIS's five subscales were revised as follows (a) Peer-Group Interactions (10 items), (b) Interactions with Faculty (5 items), (c) Faculty Concern for Student Development and Teaching (5 items), (d) Academic and Intellectual Development (8 items), and (e) Institutional and Goal Commitment (6 items). Social Integration was measured by the Peer-Group Interactions, Interactions with Faculty, and Faculty Concerns for Students subscales. Academic Integration was measured with the Academic and Intellectual Development as well as the Institutional and Goal Commitments subscales (French & Oakes, 2004; Pascarella & Terenzini, 1980). The two subscales were then merged into a composite via the creation of a single mean score.

The original Institutional Integration Scale was determined to have good internal consistency ($\alpha=.83$) for the original 30-question IIS, with the subscales ranging from 0.61 to

0.86. For the revised 34-question IIS, the coefficient alpha improved to 0.92 demonstrating excellent internal consistency, and the subscale values also improved, ranging from 0.76 to 0.89 (French & Oakes, 2004). These increased alpha values were deemed acceptable, therefore supporting the use of the revised scale and its scores (French & Oakes, 2004).

The scale's validity is supported by appropriate fit of the subscale's structure model to the data (French & Oakes, 2004). The revised model structure has been further validated in studies showing that the overall scale and subscales discriminate the group differences of high and low integration better than the original, and that they remain constant regardless of sample differences (Breidenbach & French, 2010; French & Oakes, 2004). Measurement invariance in the form of differential item functioning analysis between males and females has been investigated to show that the items work similarly across groups (Baker, Caison, & Meade, 2007; Breidenbach & French, 2010). The results of this research revealed acceptable Cronbach's alpha for both engagement measures, Social Integration and Academic Integration, at .80 (Nunally & Bernstein, 1994).

Grit Scale

The original twelve item Grit Scale is an instrument designed to measure an individual's passion and perseverance for long-term goals. The author posits that passion and perseverance are two traits that predict achievement (Duckworth, et al., 2007, 2009). The authors suggest that an individual's goal commitment and persistence to successful completion are influenced by his or her perception about their capability to successfully complete a task, the level of difficulty he or she associates with completing the task, and what he or she has to give up to achieve the task (Duckworth, Weir, Tsukayama, & Kwok, 2012; Eccles, 1983).

Constructed from the expectancy-value and achievement-goal theories, Duckworth et al. (2007) developed a 12 item scale known as the Grit Scale. Through their use of the Grit Scale, the authors determined that a relationship exists between an individual's goal commitment and his or her perceived benefits, cost, and the likelihood of achieving success, a phenomenon they call "grit" (Duckworth, et al., 2012). The total grit score is calculated by reverse scoring the appropriate items, summing the score for each of the 12 items, and dividing the total score by 12. Scores on the Grit Scale can range from 1 to 5, with 5 being the highest grit score possible. Although there are no norms established for grit, Duckworth and her colleagues (2012) found that the mean grit score was 3.65 for a sample of 1,545 adults aged 25 and older.

The original twelve item Grit Scale was found to have good internal consistency ($\alpha = .85$), thus providing evidence that the items on the Grit Scale were measuring the same construct (i.e., grit). The assessment used a two-factor model, measuring consistency of interests and perseverance of effort over extended time periods. Early analyses suggested that neither factor predicted outcomes more than the other and that the two factors, together, are more predictive of positive outcomes, thus leading the authors to recommend using total scores for the 12-item instrument that was designed to measure grit (Duckworth, et al., 2007).

Later, the authors conducted a validity study of the grit survey, computing item-level correlations for each of the four sample groups; 4 of the 12 original items were eliminated. The resulting 8-item scale, referred to as the Grit-S, showed an internal consistency ranging from .73 to .83. Confirmatory Factor Analysis (CFA) was performed on each sample to test the fit of the Grit-S Scale's second-order factor model. Results showed an acceptable level of model fit, ranging from RMSEA of .06 to .10, $p=.001$. Additional validation for the Grit-S included a CFA using a large online sample ($n=1554$) of adults who were over 25 years of age. Both consistency

of interest and perseverance of effort were first-order latent factors that were loaded on a second-order latent factor, grit. Four items comprised the consistency of interest, a first-order factor, with factor loadings ranging from 0.67 to 0.74, and four items made up the perseverance of effort, a first-order factor, with factor loadings ranging from .37 to .80. Each first-order factor was then loaded on the higher-order factor of grit, with 0.62 for consistency of interest and 1.30 for perseverance of effort. After controlling for the Big Five Inventory dimensions (conscientiousness, neuroticism, agreeableness, extraversion, and openness) as well as age, the predictive validity of grit was found to be a significant predictor of educational attainment ($b=0.27$, $OR=1.31$, $p<.001$), fewer career changes ($b=.22$, $OR=.80$, $p=.01$), and reaching the final round in the National Spelling Bee ($b=0.55$, $OR=1.73$, $p=.03$; Duckworth, et al. 2009).

The results of this research revealed an unacceptable Cronbach's alpha of .65 for the grit scale. Cronbach's alpha with item deleted revealed an alpha of .67 with the removal of question two which was still below the minimum acceptable alpha of .70 (Nunnally & Bernstein, 1994). These results suggest that the items on the scale did not acceptably measure internal consistency and therefore, did not consistently measure what they were intending to measure. Consequently, the results of data collected from the grit scale were excluded from the final analysis.

Demographics and Persistence Factor

In addition to the three instruments' 72 Likert-style questions, demographic information including gender, race, sport were collected in this study. Students were informed that participation in the study included permission to access their academic record. The number of semesters the student-athletes had been enrolled in college, the number of credits earned, and his or her Grade Point Average were collected from the University's Registrar for those students who completed the survey.

The Persistence Factor was calculated by obtaining the quotient of credits earned divided by semesters completed, by sixteen as shown in the Equation 1 below. To measure whether a student-athlete is persisting in a timely manner towards graduating in four years with a required 128 cumulative credits, sixteen credits per semester must be earned. Therefore, 16 credits per semester was used as the denominator. Scores of 1 or greater represent students who are persisting to graduation in a timely manner. Scores of less than one represent students who are not persisting to graduation in a timely manner.

$$\text{Persistence Factor} = \frac{\text{Credits earned} / \text{semesters completed}}{16} \quad (\text{Equation 1})$$

Grades below a D- were not counted as credits earned when calculating the Persistence Factor as these grades do not count for graduation purposes.

Procedures

This study was conducted during late fall, 2016 after receiving approval from the Institutional Review Board (IRB) at North Dakota State University and obtaining subsequent approval from the IRB director at the University where the study was conducted, with cooperation from the University's athletic department. Each coach and student-athlete received recruitment information describing the purpose of the research and the information being collected (Appendix A). Prior to entering the research study, each student-athlete also received a statement of informed consent that requested their participation in the study (Appendix B). Once this information was obtained, the student-athletes were given a link to begin the online survey.

In addition to demographic information, three instruments were used to gather data for this study, the Student Athlete's Motivation toward Sport and Academic Questionnaire, the Short Grit Scale and the Revised Institutional Integration Scale (Appendix C, D, E & F). The instruments were combined and given to the student-athletes electronically in a single instrument

using Qualtrics survey software available through North Dakota State University. In addition to the initial e-mail invitation, three subsequent e-mail reminders were sent over the course of two weeks requesting the student-athlete's participation in the study. The official close of the survey was December 29, 2016 to allow students an opportunity to take the survey over the holiday if they wished to do so.

One hundred and eighty-six students completed the entire survey and their data were included in this analysis.

Data Analysis

The Statistical Package for Social Sciences (SPSS) and AMOS were used for statistical analysis. Upon the conclusion of data collection, data from the three instruments was imported into SPSS and demographic information was summarized. Frequencies and percentages were used to describe categorical variables. The data was reviewed using descriptive statistics, Pearson correlations, regressions for the path analysis, and Multivariate Analysis of Variance. Preliminary analysis included scoring the scales to create the variables, assessing their reliability with Cronbach's alpha, checking the variables for normality and identifying any outliers. For research question 1, regressions for path analysis was used. Data was examined using a correlational research design and analyzed with Pearson correlation coefficients to check for bivariate linear relationships. Path analysis was conducted using multiple regression to estimate the direct and indirect causal relationships between the variables. Figure 2 includes the original paths that were investigated with the MEGSA model.

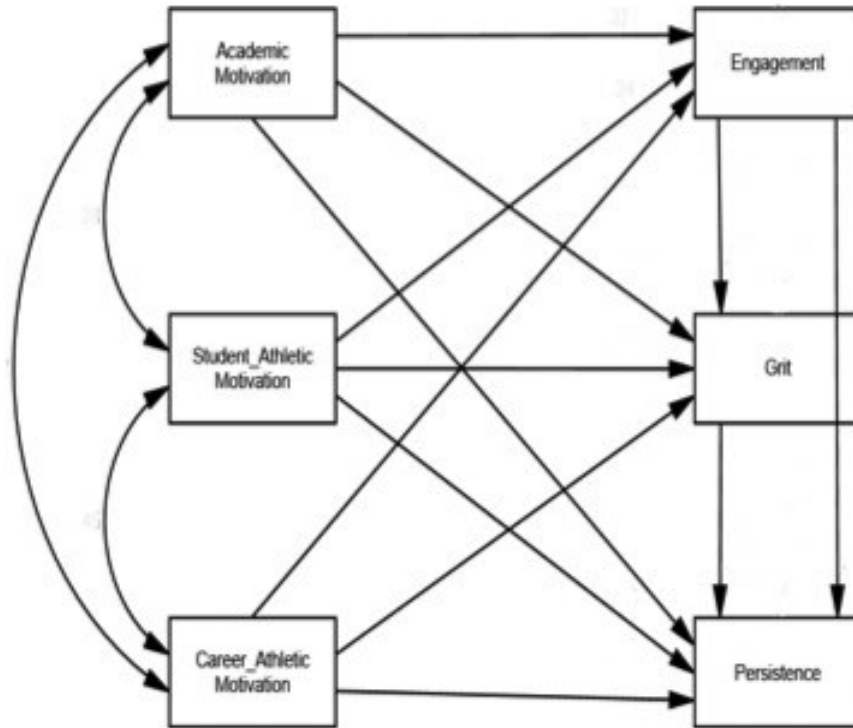


Figure 2. Proposed MEGSA path model

For research question 2, MANOVA was used to review 18 relationships that were analyzed for each of the 3 independent variables: gender, race, and sport. The dependent variables for this research question were Academic Motivation, Student-Athletic Motivation, Career-Athletic Motivation, Engagement, Grit and Persistence. The demographics were compared for each variable by using an MANOVA to look for statistically significant differences.

CHAPTER 4. RESULTS

The study utilized a proposed path model: the Motivation, Engagement, and Grit of Student-Athletes (MEGSA) model to explore the relationship between the three unique motivational constructs and Persistence for student-athletes, and the influence that Engagement and Grit have on this relationship. The two major research questions that guided this study were:

1. Is there a relationship among student-athletes' motivation (as measured using three motivational subscales: Academic Motivation, Student-Athletic Motivation, and Career-Athletic Motivation, and Persistence, and do Engagement and Grit mediate that relationship?
 - A. Do Academic Motivation, Student-Athletic Motivation or Career-Athletic Motivation influence Persistence directly and indirectly through Engagement and Grit?
 - B. Do engagement and grit directly influence persistence?
2. Do Academic Motivation, Student-Athletic Motivation, Career-Athletic Motivation, Engagement, Grit, or Persistence vary by gender, race, or sport?

Preliminary Data Analysis

The findings of this research reveal that Cronbach's alpha for the Academic Motivation subscale was acceptable at .80. According to Nunnally & Bernstein (1994), alpha is considered acceptable at .70. The mean Academic Motivation score was 4.53 ($SD = .55$). Alpha for the Student-Athletic Motivation measure was acceptable at .79; the mean Student-Athletic Motivation score ($M = 4.63$, $SD = .67$) was slightly higher than the mean Academic Motivation score. Alpha for the Career-Athletic Motivation score was also acceptable at .80. The mean Career-Athletic score ($M = 3.39$, $SD = 1.01$) was lower than the other motivation scores. Both

Engagement measures, Social Integration and Academic Integration, were reliable at .80. The mean Social Integration score was 8.01 ($SD = 1.23$). The mean Academic Integration score was 10.35 ($SD = .90$). The mean Persistence score was only .29 ($SD = .90$). Cronbach's alpha for the Grit measure was unacceptable at .65. Cronbach's alpha with item deleted revealed an alpha of .67 with the removal of question two which was still below the minimum acceptable alpha of .70 (Nunnally & Bernstein, 1994). Grit was therefore, excluded from all subsequent analysis.

Relationship among Motivation, Engagement, Grit and Persistence

The first research question sought to determine whether there would be a relationship among student-athletes' motivation and persistence, and whether engagement would mediate those relationships. To answer this research question, the proposed path model was tested. To test whether the indirect effects (of motivation via engagement and grit) were statistically significant, bootstrapping procedures were conducted ($N = 5000$ samples); 95% bias-corrected intervals were requested.

As presented in the Pearson correlation Table 3, Social Integration was positively correlated with Academic Integration, Academic Motivation, and Student-Athletic Motivation, but was not significantly correlated with Career-Athletic Motivation and Persistence. Academic Integration was positively correlated with Academic Motivation and Student-Athletic Motivation, but was not significantly correlated with Career-Athletic Motivation and Persistence. Academic Motivation was negatively correlated with Career-Athletic Motivation and positively correlated with Persistence, but was not correlated with Student-Athletic Motivation. Student-Athletic Motivation was positively correlated with Career-Athletic Motivation, but was not correlated with Persistence. Finally, Career-Athletic Motivation was negatively correlated with

Persistence ($r = -.25, p = .001$). As previously noted, Cronbach's alpha for Grit was unacceptable thereby precluding any further discussion of its relationship to the proposed constructs.

Table 3

Pearson Correlation Table (n = 186)

	Social Integration	Academic Integration	Academic Motivation	SAM	CAM	Persistence
Social Integration	1					
Academic Integration	.53**	1				
Academic Motivation	.32**	.27**	1			
Student-Athletic Motivation	.31**	.38**	.07	1		
Career-Athletic Motivation	.11	.04	-.34**	.45**	1	
Persistence	.12	.13	.24**	-.08	-.25**	1

Note. * $p < .05$. ** $p < .01$.

It was hypothesized that Academic Motivation would directly and indirectly influence Persistence. As shown in Table 4 and depicted in Figure 3, Academic Motivation did not have a significant direct effect on Persistence, $\beta = .14, p = .09$. Further, as shown in Table 5, Academic Motivation did not have a significant indirect effect on Persistence, $\beta = .04, p = .079$. Therefore, the first hypothesis was not supported.

Second, it was hypothesized that Student-Athletic Motivation would directly and indirectly influence Persistence. The findings in Table 4 reveal that Student-Athletic Motivation did not have a significant direct effect on Persistence, $\beta = -.05, p = .575$. Further, as shown in Table 5, it did not have a significant indirect effect on Persistence, $\beta = .04, p = .081$. Thus, the second hypothesis was not supported.

Table 4

Unstandardized and Standardized Direct Path Coefficients for the Proposed Path Model (n = 186)

Path	<i>B</i>	<i>SE</i>	β
Academic Motivation to:			
Engagement	.22	.05	.33 ***
Persistence	.23	.13	.14
Student-Athletic Motivation to:			
Engagement	.17	.04	.31 ***
Persistence	-.06	.12	-.05
Career-Athletic Motivation to:			
Engagement	.02	.03	.06
Persistence	-.17	.08	-.19 *
Engagement to Persistence	.29	.20	.12

* $p < .05$. ** $p < .01$. *** $p < .001$.

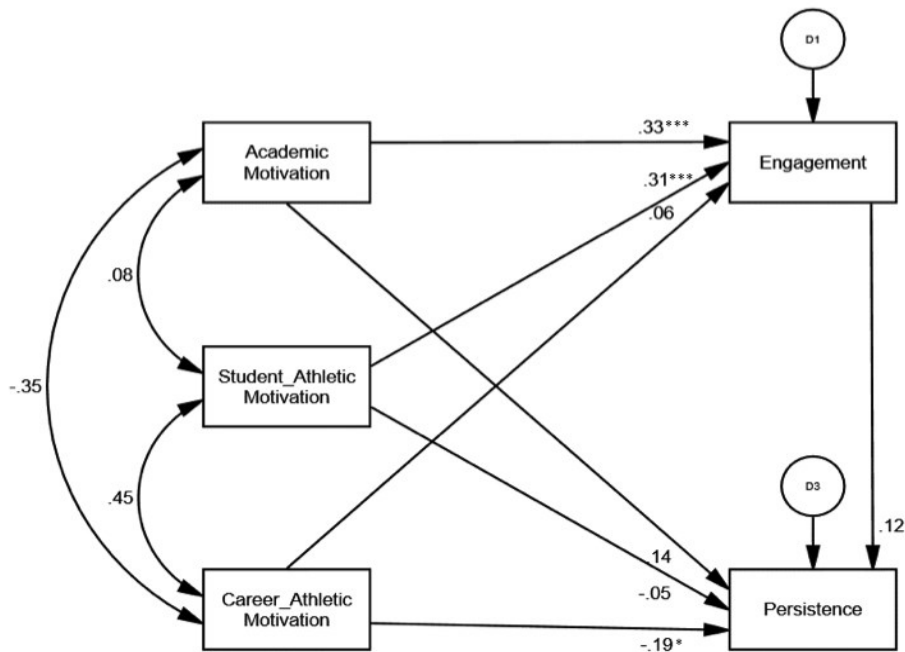


Figure 3. Standardized coefficients for the proposed path model.

Table 5

Unstandardized and Standardized Indirect Path Coefficients for the Proposed Path Model (n = 186)

Path	<i>B</i>	<i>SE</i>	β
Academic Motivation to Persistence	.06	.04	.04
Student-Athletic Motivation to Persistence	.05	.04	.04
Career-Athletic Motivation to Persistence	.01	.01	.01

* $p < .05$. ** $p < .01$. *** $p < .001$.

Third, it was hypothesized that Career-Athletic Motivation would directly and indirectly influence Persistence. The findings in Table 4 indicate that Career-Athletic Motivation had a significant direct and negative effect on Persistence, $\beta = -.19, p = .028$. But as shown in Table 5, it did not have a significant indirect effect on Persistence, $\beta = .01, p = .364$. Accordingly, the third hypothesis was partly supported.

Fourth, it was hypothesized that Engagement would directly influence Persistence. The findings in Table 4 show that Engagement did not significantly predict Persistence, $\beta = .12, p = .139$. As such, the fourth hypothesis was not supported.

Note that for mediation to occur, the following conditions must be met: the independent variable must significantly predict the mediator and the dependent variable, the mediator must significantly predict the dependent variable, the direct effect of the independent variable on the dependent variable must not be significant while the indirect effect of the independent variable on the dependent variable must be significant. But as summarized above, Engagement did not predict Persistence. Further, all the indirect effects were not significant. As such, Engagement did not mediate the relationships between the three Motivation variables and Persistence.

Model Modification

Due to the full model not being supported, the preliminary model was modified by removing paths, one at a time, to ultimately improve the model. Beginning with the least significant path, as shown in Table 6, removing Student-Athletic Motivation to Persistence ($\chi^2 = .32, p < .05$), although non-significant, increased the strength of the resulting paths.

Table 6

Chi-square Statistic and Fit Indices for the Path Models

Model	df	χ^2	CFI	Value	RMSEA		SRMR
					Low	High	
Saturated model	0		1.00	.00	.00	.16	.01
Student-Athletic Motivation to Persistence removed	1	.32	1.00	.00	.00	.11	.01
Career-Athletic Motivation to Engagement removed	2	.84	1.00	.00	.03	.13	.01
Academic Motivation to Persistence removed	3	3.46	1.00	.00	.03	.13	.03

Note. None of the chi-square statistics were statistically significant at .05. All of the RMSEA p-close values were also not significant at .05.

The next path to be removed was Career-Athletic Motivation to Engagement ($\chi^2 = .84, p < .05$) which again, although not statistically significant, showed improvement to the strength of the remaining paths. Lastly, Academic Motivation to Persistence ($\chi^2 = 3.46, p < .05$) was removed, producing a much stronger concluding path model.

As a result of removing all three non-significant paths, this step-wise analysis revealed a final path model as presented in Table 7, figure 4 whereby Academic Motivation ($\beta = .31, p < .001$) and Student-Athletic Motivation ($\beta = .34, p < .001$) positively predicted Engagement.

Engagement, in turn, positively predicted Persistence ($\beta = .15, p < .05$). Career-athletic motivation had a direct but negative effect on Persistence ($\beta = -.26, p < .001$).

Table 7

Unstandardized and Standardized Direct Path Coefficients for the Path Model with Only Statistically Significant Paths (N = 186)

Path	B	SE	β
Academic Motivation to Engagement	.20	.04	.31 ***
Student-Athletic Motivation to Engagement	.19	.04	.34 ***
Career-Athletic Motivation to Persistence	-.24	.06	-.26 ***
Engagement to Persistence	.38	.17	.15 *

* $p < .05$. ** $p < .01$. *** $p < .001$.

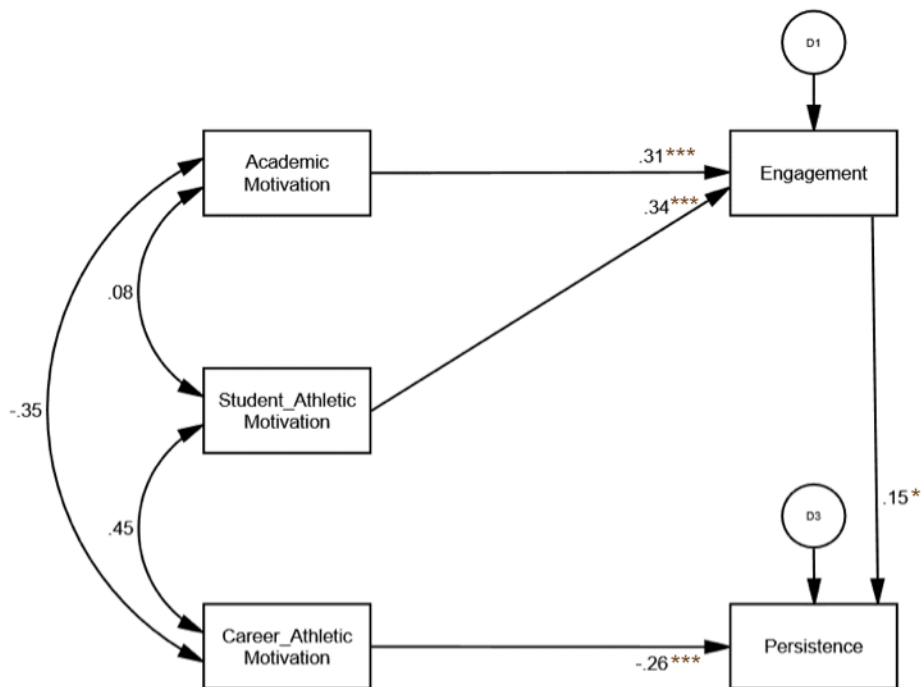


Figure 4. Standardized coefficients for the path model with only statistically significant paths.

Note again that for mediation to occur, the following conditions must be met: the independent variable must significantly predict the mediator, the mediator must significantly predict the dependent variable, the direct effect of the independent variable on the dependent variable must not be significant while the indirect effect of the independent variable on the dependent variable must be significant.

Given that Career-Athletic Motivation did not significantly predict Engagement, Engagement did not mediate the relationship between Career-Athletic Motivation and Persistence in this final model. However, as shown in table 7, figure, 4, Academic ($\beta = .31, p < .001$) and Student-Athletic Motivation ($\beta = .34, p < .001$) significantly predicted Engagement; as such, the first criterion for mediation was met. Further, Engagement significantly predicted Persistence ($\beta = .15, p < .05$); thus, the second criterion for mediation was fulfilled. These findings also revealed that the direct effects of Academic and Student-Athletic Motivation on Persistence were not statistically significant; therefore, the third criterion was met. Lastly, as shown in Table 8, the indirect effects of Academic ($\beta = .05, p < .05$) and Student-Athletic Motivation ($\beta = .05, p < .05$) on Persistence were statistically significant; therefore, the fourth criterion was fulfilled. Since all four criteria were met, Engagement significantly mediated the relationship between Academic and Student-Athletic Motivation and Persistence.

Table 8

Unstandardized and Standardized Indirect Path Coefficients for the Final Path Model (N = 186)

Path	<i>B</i>	<i>SE</i>	β
Academic Motivation to Persistence	.08	.04	.05
Student-Athletic Motivation to Persistence	.07	.04	.05 *

* $p < .05$. ** $p < .01$. *** $p < .001$.

Summary of Results for Research Question One

It was hypothesized that Academic Motivation, Student-Athletic Motivation and Career-Athletic Motivation would directly or indirectly influence Persistence and that Engagement would directly influence this relationship. The results of this study revealed that when testing the fully saturated path model Academic Motivation did not have a significant direct or indirect effect on Persistence. Therefore, this first hypothesis was not supported. Further, it was determined that Student-Athletic Motivation did not have a significant direct or indirect effect on Persistence. It was also determined that Career-Athletic Motivation did have a significant, negative effect on Persistence, $\beta = -.19, p = .028$, but Career-Athletic Motivation did not have a significant indirect effect on Persistence, $\beta = .01, p = .364$. Accordingly, the third hypothesis was partly supported. Finally, it was determined that Engagement did not have a direct effect on Persistence, and because none of the indirect effects were significant, Engagement did not mediate the relationships between the three Motivation constructs and Persistence. Therefore, these hypotheses were not supported.

Additionally, step-wise analysis was conducted to remove the non-significant paths revealing a significant, positive relationship between Engagement and Persistence ($\beta = .15, p < .05$) and a significant indirect effect of Academic ($\beta = .05, p < .05$) and Student-Athletic Motivation ($\beta = .05, p < .05$) on Persistence. This finding suggests that the non-significant paths created a suppressor effect that, once removed, revealed that Academic Motivation and Student-Athletic Motivation did indirectly predict Persistence through Engagement.

Differences in Motivation, Engagement and Persistence by Race, Gender and Sport

The second research question sought to determine whether Academic Motivation, Student-Athletic Motivation, Career-Athletic Motivation, Engagement, and Persistence varied by gender, race, and sport. To answer this question, MANOVA procedures were conducted.

Gender

The MANOVA findings indicate that the five study variables differed significantly across gender, Wilks' $\lambda = .86$, $F(5, 180) = 5.47$, $p = .001$, partial $\eta^2 = .13$. As shown in Table 9, the univariate ANOVA findings further reveal that Student-Athletic Motivation scores differed significantly across male and female student athletes, $F(1, 184) = 6.85$, $p = .01$, partial $\eta^2 = .036$. Male athletes ($M = 4.73$, $SD = 0.71$) had significantly higher Student-Athletic Motivation scores than female athletes ($M = 4.47$, $SD = 0.57$).

Career-Athletic Motivation scores also differed significantly across gender, $F(1, 184) = 14.42$, $p = .001$, partial $\eta^2 = .07$. Male athletes ($M = 3.61$, $SD = 1.04$) had significantly higher Career-Athletic Motivation scores than female athletes ($M = 3.05$, $SD = 0.88$). Lastly, Persistence ratings differed significantly across male and female student athletes, $F(1, 184) = 12.72$, $p = .001$, partial $\eta^2 = .065$. Male athletes ($M = .10$, $SD = 0.88$) had significantly lower Persistence ratings than female athletes ($M = .57$, $SD = 0.87$).

Table 9

ANOVA Results for Gender (n = 186)

Dependent Variable	<i>df</i>	<i>MS</i>	<i>F</i>	<i>Partial</i> η^2
Academic Motivation				
Between groups				
Within groups	1	.80	2.61	.014
Student-Athletic Motivation	184	.30		
Between groups				
Within groups	1	2.98	6.85 *	.036
Career-Athletic Motivation	184	.44		
Between groups				
Within groups	1	13.79	14.42 **	.073
Engagement	184	.96		
Between groups				
Within groups	1	1.17	1.35	.007
Persistence	184	.87		
Between groups				
Within groups	1	9.77	12.72 **	.065
	184	.77		

Note. The five dependent variables differed significantly across gender, Wilks' $\lambda = .86$, $F(5, 180) = 5.47$, $p < .001$, partial $\eta^2 = .13$. * $p < .05$. ** $p < .001$.

Race

The MANOVA findings indicate that the five study variables did not differ significantly across the seven race categories, Wilks' $\lambda = .82$, $F(25, 655) = 1.40$, $p = .09$, partial $\eta^2 = .04$. But when Whites were compared to non-Whites, the five study variables did differ significantly across race, Wilks' $\lambda = .90$, $F(5, 180) = 3.81$, $p = .003$, partial $\eta^2 = .09$. As shown in Table 10, the univariate ANOVA findings further reveal that Career-Athletic Motivation scores differed significantly across race, $F(1, 184) = 4.64$, $p = .03$, partial $\eta^2 = .025$.

Table 10

ANOVA Results for Race (n = 186)

Dependent Variable	<i>df</i>	<i>MS</i>	<i>F</i>	Partial η^2
Academic Motivation				
Between groups				
Within groups	1	.00	.001	.000
Student-Athletic Motivation	184	.31		
Between groups				
Within groups	1	.90	2.02	.011
Career-Athletic Motivation	184	.45		
Between groups				
Within groups	1	4.67	4.64 *	.025
Engagement	184	1.01		
Between groups				
Within groups	1	.89	1.02	.006
Persistence	184	.87		
Between groups				
Within groups	1	3.40	4.25 *	.023
	184	.80		

Note. The five study variables differed significantly across race, Wilks' $\lambda = .90$, $F(5, 180) = 3.81$, $p = .003$, partial $\eta^2 = .09$. * $p < .05$.

Non-White athletes ($M = 3.74$, $SD = 1.04$) had significantly higher Career-Athletic Motivation scores than White athletes ($M = 3.31$, $SD = 0.99$). Persistence ratings also differed significantly across non-White and White athletes, $F(1, 184) = 4.25$, $p = .041$, partial $\eta^2 = .023$. Non-White athletes ($M = -.01$, $SD = .95$) had significantly lower Persistence ratings than White athletes ($M = .34$, $SD = .88$).

Type of Sport

The MANOVA findings indicate that the five study variables differed significantly across type of sport, Wilks' $\lambda = .53$, $F(70, 799) = 1.57$, $p = .004$, partial $\eta^2 = .12$. The univariate

ANOVA findings summarized in Table 11 reveal that Career-Athletic Motivation scores differed significantly across type of sport, $F(14, 171) = 3.70, p = .001$, partial $\eta^2 = .23$.

Table 11

ANOVA Results for Type of Sport (n = 186)

Dependent Variable	<i>df</i>	<i>MS</i>	<i>F</i>	<i>Partial η^2</i>
Academic Motivation				
Between groups	14	.43	1.42	.105
Within groups	171	.30		
Student-Athletic Motivation				
Between groups	14	.62	1.43	.105
Within groups	171	.43		
Career-Athletic Motivation				
Between groups	14	3.15	3.70 ***	.232
Within groups	171	.85		
Engagement				
Between groups	14	.94	1.08	.081
Within groups	171	.87		
Persistence				
Between groups	14	1.93	2.67 **	.179
Within groups	171	.73		

Note. The five study variables did differ significantly across race, Wilks' $\lambda = .53, F(70, 799) = 1.57, p = .004$, partial $\eta^2 = .12$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Post-hoc Tukey comparisons indicate that male hockey athletes ($M = 4.23, SD = .79$) had significantly higher Career-Athletic Motivation scores than football players ($M = 3.14, SD = 1.14; p = .023$), male basketball players ($M = 3.17, SD = 1.03; p = .041$), women's volleyball players ($M = 2.64, SD = .79; p = .003$), women's basketball players ($M = 2.75, SD = .58; p < .001$), and women's softball players ($M = 2.85, SD = .74; p = .01$).

Persistence ratings also differed significantly across type of sport, $F(14, 171) = 2.67, p = .002$, partial $\eta^2 = .179$. Post-hoc Tukey comparisons indicate that male baseball players ($M = -$

.12, $SD = .86$) had lower Persistence ratings than female track and field athletes ($M = 1.01$, $SD = 1.13$; $p = .009$) and female basketball players ($M = .73$, $SD = .98$; $p = .023$). Male hockey players ($M = -.18$, $SD = .57$) also had significantly lower Persistence ratings than female track and field athletes ($p = .017$).

Summary of Results for Research Question Two

It was hypothesized that Academic Motivation, Student-Athletic Motivation, Career-Athletic Motivation, Engagement, and Persistence would vary by gender, race, and type of sport. The findings revealed that Career-Athletic Motivation and persistence ratings did differ across gender, race, and some types of sports. Therefore, this hypothesis was partially supported.

CHAPTER 5. DISCUSSION

The purpose of this research was to examine non-cognitive factors that impact persistence of student-athletes, specifically the relationships among Motivation, Engagement, Grit, and Persistence, and whether such relationships vary by gender, race or sport. The first research question sought to determine whether motivation, as measured using the three unique subscales: Academic Motivation, Student-Athletic Motivation, and Career-Athletic Motivation, influence Persistence, and whether Engagement and Grit would mediate such relationships.

Five hypotheses were used to address the first research question. The first hypotheses considered whether Academic Motivation would influence Persistence directly, and indirectly through Engagement and Grit, by examining the relationship of Academic Motivation to Persistence. The second hypotheses considered whether Student-Athletic Motivation would influence persistence directly, and indirectly through engagement and grit, by examining the relationship of student-athletes' Athletic Motivation to Persistence, and the third hypotheses considered whether Career-Athletic Motivation would influence Persistence directly, and indirectly through Engagement and Grit, by examining the relationship of student-athletes' Career-Athletic Motivation to Persistence. The fourth hypotheses addressed whether Engagement would directly influence Persistence, and the fifth hypotheses considered whether Grit would directly influence Persistence. The proposed path model: the Motivation, Engagement, and Grit of Student-Athletes (MEGSA) model was used to examine these relationships.

The second research question sought to determine whether Academic Motivation, Student-Athletic Motivation, Career-Athletic Motivation, Engagement, Grit, and Persistence

varied by gender, race, and sport. To examine this research question, MANOVA procedures were conducted.

The Relationship among Motivation, Engagement, Grit and Persistence

Regarding whether Motivation, Engagement and Grit directly or indirectly influence Persistence it was noted that the grit scale did not achieve an acceptable alpha of .70 or greater ($\alpha = .65$). Therefore, Grit was eliminated from the resulting path model.

For the first hypotheses, this study revealed that Academic Motivation did not have either a direct or an indirect influence on Persistence, but it did have a direct positive effect on Engagement ($\beta = .31, p < .001$). Pearson correlation analysis also showed a significant positive relationship between Academic-Motivation and both Social Integration $r = .32, p < .01$, and Academic Integration, $r = .27, p < .01$. Academic-Motivation was also significantly related to Persistence, $r = .24, p < .01$. Similarly, Student-Athletic Motivation did not directly or an indirect predict Persistence, but did have a significant positive effect on engagement ($\beta = .34, p < .001$), as well as a significant positive relationship with both Social Integration $r = .31, p < .01$, and Academic Integration, $r = .38, p < .01$.

Previous research conducted by Terenzini and Wright (1987) examined the number of hours that students indicated they spent interacting with faculty outside of class, and how much time they engaged in organized extracurricular activities. In Terenzini and Wright's (1987) work, the authors found that the amount of time students spent participating in these activities had a direct and positive effect on students' academic skill development. Although the results of this study did not indicate that Engagement directly or indirectly predicted Persistence for the fully saturated path model, step-wise analysis revealed that when eliminating the three non-significant paths, Engagement did in fact predict Persistence ($\beta = .15, p < .05$). The significant

relationship between Academic Motivation and Student-Athletic Motivation to Engagement, and the significant relationship between Engagement and Persistence suggests that the non-significant paths created a suppressor effect that, once removed, revealed that Academic Motivation ($\beta = .05, p = .017$) and Student-Athletic Motivation ($\beta = .05, p = .018$) did indirectly predict Persistence through Engagement. These results suggest that students with higher Academic Motivation and Student-Athletic Motivation scores are more likely to engage in academic and social activities that contribute to Persistence, a finding that is consistent with previous research.

Career-Athletic Motivation revealed a significant influence on Persistence noting a significant direct negative influence on Persistence, $\beta = -.19, p = .028$. Pearson's correlation analysis also noted a significant negative relationship between Career-Athletic Motivation and Academic Motivation, $r = -.34, p < .01$ and Persistence $r = -.25, p < .01$. The results of this hypotheses suggest that as student-athletes become more motivated to achieve success in their sport beyond college, they become less motivated to do well academically, and consequently, they are less likely to persist to graduation (Adler and Adler, 1991; Gaston-Gayles, 2004; Stevenson, 1999).

Achievement-motivation theories have a basic assumption that motivation towards a specific task is determined by an individual's choice, persistence, and effort applied to a task (Weiner, 1985). Theoretically, a student-athlete who is motivated to approach a specific task would exert significant energy and time towards successfully completing that task. Therefore, it is likely that student-athletes who were motivated to achieve success on the playing field will exert the time and energy required to be successful in their sport. Similarly, student-athletes who demonstrate an interest in achieving a college degree, it is equally likely to expect that these

student-athletes will exert the time and energy required to be successful in the classroom and therefore, to persist to degree completion. The findings revealed in this study are consistent with previous research.

Motivation is derived from the individual's underlying attitudes and goals, and is not a unitary phenomenon (Ryan & Deci, 2000). Ryan and Deci (2000) defined motivation as "being moved to do something" (p. 54), suggesting that, if a student feels no inspiration to act, he or she is unmotivated. Kuh (2009a) later added that students are motivated to engage in activities that are perceived to help them achieve a desired outcome, thereby suggesting that peoples' motivation may vary based on the attitudes and goals that they may have about a given task or a desired outcome. Such actions are often intrinsically or extrinsically rationalized. Beghetto (2004) posited that student motivation provides the greatest contribution to students' academic success. Student-athletes at this small, private, Midwestern university who desired to be successful both academically and athletically were more likely to engage in academic and social activities posited to predict persistence, but also in the athletic initiatives that would contribute to their ability to achieve athletic success. What is likely however, for student-athletes at this university, is that the amount of time and energy required to achieve both academic and athletic success means that it may take longer to complete their education than the traditional four years as measured utilizing the Persistence Factor described in this research. It is worth the added commentary however, that as student-athletes become more interested in achieving a career in athletics beyond college, this study was consistent with previous research that suggests that these student-athletes are less likely to graduate on time, if at all.

Differences in Motivation, Engagement, and Persistence by Race, Gender, Sport

Research question number two utilized MANOVA procedures to determine whether Academic Motivation, Student-Athletic Motivation, Career-Athletic Motivation, Engagement, Grit and Persistence varied by gender, race, and sport. The findings of this research are discussed below.

Gender – The findings of this research revealed that male student-athletes had significantly higher Student-Athlete Motivation and Career-Athlete Motivation than female athletes, suggesting that male student-athletes at this University are more likely to be motivated by their sport than female student-athletes. As expected, male student-athletes also had significantly lower Persistence ratings than female athletes, further suggesting that as student-athletes' motivations to do well in their sport increase, the likelihood that they will graduate on time decreases. This phenomenon is consistent with previous research which found that intercollegiate-athletic participation had a significant, limiting effect on general cognitive development for both male and female student-athletes during their first year of college noting however, that the effect was less for women (Pascarella, Bohr, Nora, & Terenzini (1995).

While chronicling the experiences of male student-athletes at an elite NCAA Division I university, Adler and Adler (1991) noted that although these student-athletes entered college optimistic about achieving their academic aspirations, after a few short semesters, the student-athletes began to devalue their academic goals in pursuit of their athletic goals. Similarly, while studying the relationship of student-athletes' motivational orientation to his or her academic performance and identification, Simons et al. (1999) noted that female student-athletes were less likely to attend college purely for athletic reasons. Gaston (2002), and later Gaston-Gayles (2004), determined that participating in college sports was modestly related to the motivation to

complete a college degree, and that participation was attributed mainly to female athletes. The author noted that female athletes at a large NCAA Division I program was more likely to be motivated academically than their male counterparts. Several others have found that female student-athletes were more engaged in their academic development than male student-athletes (Gaston, 2002, 2004; Lantz, Etzel, & Ferguson, 1996; Pascarella & Smart, 1991; Simons, Van Rheenen, & Covington, 1999).

Race - The findings of this research revealed that non-white student-athletes had significantly higher Career-Athlete Motivation than their white counterparts suggesting that non-white student-athletes at this University are more likely to be motivated to continue playing their sport beyond college than white student-athletes. As expected, non-white student-athletes also had significantly lower Persistence ratings than white student-athletes suggesting again, that as student-athletes' motivations to do well in their sport increase, the likelihood that they will graduate on time decreases. This phenomenon is consistent with previous research which found that 96.1% of the 76 institutional members of the country's 6 largest NCAA Division I athletic conferences graduated black, male student-athletes at rates lower than other student-athletes (Harper, Williams, and Blackman, 2013). Non-white student-athletes in this study were more likely to be interested in achieving success in their sport beyond college and consequently were not as motivated academically resulting in delayed persistence. Although this delay does not necessarily mean that the student-athlete will not graduate, evidence reviewed in this research suggests a significant negative correlation between student-athletes' Career-Athletic Motivation and persistence thereby suggesting that it may take more than four years to do so.

Sport - The findings of this research revealed that Career-Athletic Motivation differed significantly across certain sports. Male hockey players had significantly higher Career-Athletic

Motivation scores than football, men's and women's basketball, women's volleyball and women's softball suggesting that male hockey players are more motivated to pursue their sport after college than those in the other sports. Persistence factors also differed significantly by sport with men's hockey players' Persistence factor significantly lower than women's track and field. Baseball players' Persistence factor was also significantly less than women's track and field as well as women's basketball. These results are consistent with previous research that suggests that as students become more motivated to achieve success athletically, they often do so at the expense of their academic and social growth. However, previous research primarily studied revenue producing sorts such as football and men's basketball noting that these student-athletes performed at lower levels than athletes competing in non-revenue producing sports (Pascarella, Bohr, Nora, and Terenzini, 1995). At the University studied in this research, hockey was a sport added in the fall, 2016. Many of these athletes were competing at the collegiate level after spending one to three years in a junior, post-high school league with the aspirations of continuing their sport as a career. As they began to realize a different future, attending college to get a degree while continuing to play hockey at a lower level became more of a reality than a goal. Therefore, it isn't surprising that this group of students retained a motivation to continue playing their sport professionally after college which stands to hinder their likelihood of graduating in a timely, four year period.

Limitations

Several limitations were present within this study that should be noted. One important limitation was the achievement of an unacceptable alpha score for the grit scale, thereby eliminating the ability to analyze the data related to this construct. Although the grit scale has received criticism for its validity (Crede, 2016), it is possible that the information obtained in

this research could have contributed immensely to what is already being discussed about grit, particularly as it relates to this unique population who has to endure significant challenges in order to balance their desire to simultaneously participate in athletics while obtaining their college degree. The results of this research confirms that student-athletes are a unique population of students. The road to success for this population is clearly different than it is for traditional students. Continuing to study the qualities that contribute to student-athletes' academic persistence is a critical piece that needs further study.

Another important limitation was the timing of the data collection. Since data collection occurred over a brief, two week period of time during the end of the fall semester, students may not have had the time necessary to participate in the survey. Although the student-athletes were given a few extra days beyond the end of finals week to participate in the study, many may not have opened their e-mail once they left campus for the holiday. One hundred and eighty-six student-athletes participated in this study, representing 32% of the 579 athletes who compete in the 17 different sports at this university. Although this was statistically an acceptable response rate, it may have resulted in a relatively low power for the type of path analysis utilized in this study. It is possible that a larger sample may have resulted in more significant paths.

Although the 32% percent response rate was a satisfactory response rate from the population of student-athletes at this university, it is important to note that this sample is from a single institution. Student-athletes in different parts of the country who play in different leagues, divisions, and conferences, and who have achieved varying levels of post season success may differ in their commitment to their academics and their sport during and beyond college. The size of the institution represented in this study is smaller than the well-known,

larger Division I institutions. Therefore, the characteristics of the student-athletes in the sample may be different than student-athletes at these and other universities. Consequently, the results may not be generalizable to other populations of student-athletes' whose athletic, academic, and social experiences may be vastly differently.

Lastly, the use of the Persistence Factor as an equation to measure the progress students were making throughout their four years in college was unique to this research. Not all teams require the same amount of commitment to participate collegiately. Therefore, it is likely that student-athletes might persist differently depending on which sport they are completing in. Male sports that require size and strength such as football for example, may encourage their student-athletes to red-shirt their first year of college resulting in an additional year to complete their degree. Therefore, a four year measure may not be the only consideration for this population. Persistence factor is a construct that offers significant opportunity as a tool to track and measure students-athletes' likelihood of obtaining a college degree. With the tremendous pressure placed upon institutions and athletic departments to recruit student-athletes who will graduate, persistence factor should continue to receive further attention.

Implications for Theory

Grit research, specifically the use of the grit scale as a single measure of passion and perseverance towards long-term goals, has achieved mixed reviews. The results of this research contributed to existing theory that suggests that the scale itself may not measure what it is intending to measure. This may be particularly true as a single, grit score. Student-athletes are a unique population of people who have had to endure struggles at many levels in order to achieve the opportunity to play their sport collegiately. It is believed that by nature, this population

would describe themselves as gritty. Student-athletes are likely to have many of the characteristics intended to be represented in the scale, yet the instrument itself did not show internal consistency for this population of students. These results suggest that student-athletes may think and act differently than previously studied populations that have supported existing theory.

Secondly, the results of this research support the continued use of Gaston's (2002) SAMSAQ survey. Despite the fact that most of the research conducted using this survey has been at larger institutions, the results achieved in this research are consistent with previous findings. These findings support the theory that student-athletes' motivations are derived from their underlying attitudes and goals, and are not a unitary phenomenon (Ryan and Deci, 2000) thereby supporting future use of this survey as a means of measuring the trifurcated motivations of student-athletes.

Lastly, when removing the non-significant paths, the final path model revealed a significant relationship between Engagement and Persistence, a result consistent with existing theory. Also consistent with current literature was the fact that for those student who were more motivated to achieve a career in athletics, they were less likely to engage and thus, less likely to persist in a timely manner. Current theory suggests that these student-athletes' motivations are directed towards achieving a professional career in athletics and therefore, they neglect the opportunities to connect with their faculty, advisors, and other students who can help them achieve success in college.

Implications for Research

As noted, for this population of students, the questions on the grit scale did not meet an alpha high enough to demonstrate internal consistency. Therefore, the eight questions intended

to measure the grit score of these student-athletes were not able to be analyzed, contributing to the concerns of others that the questions themselves may not measure what Duckworth and her colleagues were intending them to measure, particularly when combined into a single score. Future research should consider whether student-athletes think differently than others, and therefore respond differently when asked to answer questions such as “Do setbacks disappoint you?” Athletes who experience the ups and downs, both publically and privately, symptomatic of sport participation are likely to respond to that question far differently than someone who may not have had that same level of public accountability. Theoretically, further thought should be given to this unique population of students and whether grit should be measured as a single construct or as two separate constructs when discussing student-athletes.

This research supported the notion that student-athletes’ college experiences are different than for the general student. Therefore, it is necessary to continue studying the multiple factors that contribute to understanding this population of students. As was demonstrated in this research, Career-Athletic Motivated students enter college at a higher risk of not graduating on time, if at all. Therefore, opportunities to understand what factors can contribute to their willingness to engage in educationally purposeful activities that will support them academically is critical if we are serious about graduating this population of students.

Lastly, Persistence Factor was constructed as a means of measuring the progress that student-athletes were making towards the university’s graduation requirement of 128 credits in a four year period. It is believed that this type of scoring mechanism has considerable potential for future research. In the past, graduation or GPA have been used as measures of persistence, but Persistence Factor provides a means by which to periodically measure whether the student-

athlete is on track to graduate. Future research should take into consideration similar measurements that would accommodate five and six year terms of enrollment.

Implications for Practice

Student-athletes are a population of students whose academic and athletic successes are a result of abilities and efforts that are uniquely different than traditional students. It was posited in this study that motivation, engagement and grit would influence the persistence of this population of students whose time in college is spent far differently than other students. Because of these differences, it was the intention of this research to contribute to the growing body of research related to non-cognitive factors that may someday be used in the admissions process to enroll and support those students who are most likely to succeed in college.

Although the results of this research did not reveal a direct predictive relationship between Academic Motivation and Persistence and Student-Athletic Motivation and Persistence, the final path model did reveal a relationship between Engagement and Persistence when removing all other non-significant paths. Therefore, this research confirmed that student-athletes' motivations do influence their willingness to engage in the academic and social activities on campus that have been posited to predict persistence. Similarly, the more motivated a student-athlete is to achieve athletic success during and after college, the more unlikely it is that they will graduate on time, or maybe ever. Therefore, it would be insightful, if not impactful, if coaches, advisors, mentors and others better understood the motivating factors that drive their recruits, especially for male and non-white student-athletes who are at the greatest risk of not graduating. Student-athletes at small colleges make up a large majority of the student population; not graduating these students can have devastating consequences both financially and reputationally. Therefore, more needs to be done up front to understand the needs and

desires of this population of students in order to productively and efficiently guide their efforts to obtain a college degree.

Conclusion

College graduation can provide unlimited opportunities for students who are fortunate enough to finish. Yet, we know many who begin do not persist. Student-athletes are a unique population of college students who face profound challenges on their journey to seeking a college degree. Often they have bifurcated goals that can distract them from graduating in a timely manner, or for some, ever. This study confirmed that differences in student-athletes' motivations are related to both engagement and persistence. The more interested a student-athlete is in their athletic career, the less likely they are to persist through college in a timely manner. Although this may not mean that he or she will not graduate from college at all, it does mean that it may take longer, will likely require greater perseverance, and it will certainly cost more to do so. Student-athletes represent a significant number of students who are attending colleges today and the results of this research supports the notion that they present differently than the general student population. Consequently, more needs to be done to support their efforts to balance academics and athletics in a way that contributes to their likelihood of achieving a college degree.

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**APPENDIX A. RECRUITMENT SCRIPT FOR STUDENT-ATHLETES AT THE
UNIVERSITY OF JAMESTOWN**



Dear University of Jamestown Student-Athletes,

My name is Polly Peterson and, in addition to my current role here at the University of Jamestown, I am completing my Ph.D. in Education at North Dakota State University. I graduated from UJ in 1989. While a student here, I too, competed in athletics. To complete my degree, I am conducting research that will help me, academic professionals, coaches, parents and others better understand what contributes to student-athletes success in college. I am requesting your assistance by participating in this study.

There is a consent form at the beginning of the questionnaire that explains what this study is about. Please read it carefully. By agreeing to participate in this research you acknowledge that through the use of your university email address the researcher will have access to your university data through the university database system. All personal identification will be immediately removed upon collection of the analysis, and NO information about you, individually, will be reported.

As with all research, your participation is voluntary, and you may choose to not participate or you may choose to discontinue participating in the questionnaire at any time.

If you have any questions about this study, please contact me (Polly Peterson, ppeterso@uj.edu, 701-252-3467 ext. 5619) or my advisor, Dr. Chris Ray, chris.ray@ndsu.edu).

Thank you for helping me complete this important research.

Polly Peterson

APPENDIX B. INFORMED CONSENT



Informed Consent Form

Please click the link below when ready to begin this Questionnaire:

Title of Research: Three Non-Cognitive Factors the Influence the Persistence of Student-Athletes: Motivation, Engagement, and Grit.

Researcher: Polly Peterson

Purpose of the Study: The purpose of this research is to study the relationship between three non-cognitive factors: motivation, engagement and grit, and persistence of student-athletes

Procedures to be followed: You will be asked to provide minimum demographic information followed by providing responses to 3 short instruments. Using your email address, the researcher will also collect basic information from University of Jamestown records, including your ACT score, GPA, semesters and credits completed, scholarship data, race, gender, and sport participation.

Duration/Time: It will take approximately 10 to 15 minutes to complete these questions

Statement of Confidentiality: Your participation in this research is confidential. By agreeing to participate in this research you acknowledge that through the use of your university email address the researcher will have access to your university data through the university database system. All personal identification will be immediately removed upon collection of the data.

Right to Ask Questions: Please contact me, Polly Peterson, at ppeterso@uj.edu, with questions or concerns about this study. You can also contact my advisor, Dr. Chris Ray, at chris.ray@ndsu.edu. If you have questions about your rights, or complaints about this research, you may talk to the researcher or contact the NDSU Human Research Protection Program by telephone: (701) 231-8995 or 1-855-800-6717, Email: ndsu.irb@ndsu.edu, or mail: NDSU HRPP Office, NDSU Dept. 4000, PO Box 6050, Fargo, ND 58108-6050.

Voluntary Participation: Your decision to participate in this research is voluntary. You can stop at any time. You do not have to answer any questions you do not want to answer.

Completion of this survey questionnaire implies that you have read the information in this form and consent to take part in this research.

Please click the link below to begin the questionnaire.

APPENDIX C. DEMOGRAPHIC INFORMATION

PART 1: Demographic Information (When applicable, unless otherwise indicated, please respond by checking only one of the options.)

1. What is your gender? Male Female

2. Race/Ethnicity

Black/African American American Indian

White/Caucasian Hispanic

Asian/Pacific Islander Other

3. In which sport(s) do you participate (select all that apply)?

Men's Football Women's Volleyball

Men's Soccer Women's Soccer

Men's Cross Country Women's Cross Country

Men's Golf Women's Golf

Men's Basketball Women's Basketball

Men's Wrestling Women's Wrestling

Men's Baseball Women's Softball

Men's Track & Field Men's Track & Field

4. Are you the first person in your family to attend a college or university (select all that apply)?

Yes

No, Mother attended college

No, Father attended college

No, Grandparents attended college

5. What was your ACT Score? _____ SAT Score? _____ High School GPA? _____

6. Do you receive an athletic scholarship from the University? Yes No

7. Do you receive an academic scholarship from the University? Yes No

8. Not including the current semester, how many semesters have you been enrolled in college as a degree seeking student?

___ 1 ___ 2 ___ 3 ___ 4 ___ 5 ___ 6 ___ 7 ___ 8 ___ 9 ___ 10 ___ 11 ___ 12
___ greater than 12

9. Not including any credits in which you are currently enrolled, how many credits (grade of a D- or better) have you earned? _____

10. How much do you feel you have improved athletically while playing on your college team?

___ I have not improved ___ I have somewhat improved
___ I have improved substantially

11. Please answer the following question about playing time

I am a starter on my team _____

I am not a starter, but am OK with the amount of playing time I am getting

I am not receiving a lot of playing time, but expect to in the future

I am not receiving a lot of playing time and believe it is unlikely that I will in the future

I am a redshirt athlete and therefore am not competing this year

12. I plan to continue participating in my sport until I graduate

Yes

No, but I plan to continue at this university and earn my degree

No, and I plan to transfer to another university to earn my degree

No, so I do not plan to continue attending college here or any other university

**APPENDIX D. STUDENT ATHLETES' MOTIVATION TOWARDS SPORTS AND
ACADEMICS QUESTIONNAIRE**

Please use the chart below as a guide to answer the following 30 questions.

VSD = Very Strongly Disagree

A = Agree

SD = Strongly Disagree

SA = Strongly Agree

D = Disagree

VSA = Very Strongly Agree

- | | |
|--|-------------------|
| 1. I am confident that I can achieve a high grade point average this year (3.0 or above) | VSD SD D A SA VSA |
| 2. Achieving a high level of performance in my sport is an important goal for me this year. | VSD SD D A SA VSA |
| 3. It is important to me to learn what is taught in my courses. | VSD SD D A SA VSA |
| 4. I am willing to put in the time to earn excellent grades in my courses. | VSD SD D A SA VSA |
| 5. The most important reason why I am in school is to play my sport. | VSD SD D A SA VSA |
| 6. The amount of work required in my courses interferes with my athletic goals. | VSD SD D A SA VSA |
| 7. I will be able to use what is taught in my courses in different aspects of my life outside of school. | VSD SD D A SA VSA |
| 8. I chose to play my sport because it is something I am interested in as a career. | VSD SD D A SA VSA |
| 9. I have some doubt about my ability to be a star athlete on my team. | VSD SD D A SA VSA |

10. I chose (or will choose) my major because it is something I am interested in as a career. VSD SD D A SA VSA
11. Earning a high grade point average (3.0 or above) is not an important goal for me this year. VSD SD D A SA VSA
12. It is important to me to learn the skills and strategies taught by my coaches. VSD SD D A SA VSA
13. It is important for me to do better than other athletes in my sport. VSD SD D A SA VSA
14. The time I spend engaged in my sport is enjoyable to me. VSD SD D A SA VSA
15. It is worth the effort to be an exceptional athlete in my sport. VSD SD D A SA VSA
16. Participation in my sport interferes with my progress towards earning a college degree. VSD SD D A SA VSA
17. I get more satisfaction from earning an "A" in a course toward my major than winning a game in my sport. VSD SD D A SA VSA
18. During the years I compete in my sport, completing a college degree is not a goal for me. VSD SD D A SA VSA
19. I am confident that I can be a star performer on my team this year. VSD SD D A SA VSA
20. My goal is to make it to the professional level or the Olympics in my sport. VSD SD D A SA VSA
21. I have some doubt about my ability to earn high grades in some of my courses. VSD SD D A SA VSA

22. I am confident that I can make it to an elite level in my sport (Professional/Olympics) VSD SD D A SA VSA
23. I am confident that I can earn a college degree. VSD SD D A SA VSA
24. I will be able to use the skills I learn in my sport in other areas of my life outside of sports. VSD SD D A SA VSA
25. I get more satisfaction from winning a game in my sport than from getting an “A” in a course toward my major. VSD SD D A SA VSA
26. It is not important for me to perform better than other students in my courses. VSD SD D A SA VSA
27. I am willing to put in the time to be outstanding in my sport. VSD SD D A SA VSA
28. The content of most of my courses is interesting to me. VSD SD D A SA VSA
29. The most important reason why I am in school is to earn a degree. VSD SD D A SA VSA
30. It is not worth the effort to earn excellent grades in my courses. VSD SD D A SA VSA

APPENDIX E. SHORT GRIT SCALE

Directions for taking the Grit Scale: Please respond to the following 8 items. Be honest. There are no right or wrong answers!

1. New ideas and projects sometimes distract me from previous ones.

- Very much like me
- Mostly like me
- Somewhat like me
- Not much like me
- Not like me at all

2. Setbacks don't discourage me.

- Very much like me
- Mostly like me
- Somewhat like me
- Not much like me
- Not like me at all

3. I have been obsessed with a certain idea or project for a short time but later lost interest.*

- Very much like me
- Mostly like me
- Somewhat like me
- Not much like me
- Not like me at all

4. I am a hard worker.

- Very much like me
- Mostly like me
- Somewhat like me
- Not much like me
- Not like me at all

5. I often set a goal but later choose to pursue a different one.*

- Very much like me
- Mostly like me
- Somewhat like me
- Not much like me
- Not like me at all

6. I have difficulty maintaining my focus on projects that take more than a few months to complete.*

- Very much like me
- Mostly like me
- Somewhat like me
- Not much like me
- Not like me at all

7. I finish whatever I begin.

- Very much like me
- Mostly like me
- Somewhat like me
- Not much like me
- Not like me at all

8. I am diligent.

- Very much like me
- Mostly like me
- Somewhat like me
- Not much like me
- Not like me at all

APPENDIX F: INSTITUTIONAL INTEGRATION SCALE-REVISED

Following is a list of statements that characterize various aspects of academic and social life at this university. Using the scale to the right of the statements, please indicate the extent of your agreement or disagreement with each statement, as it applies to your experience during the past few months, by circling the appropriate number. Please choose ONLY ONE number for each statement.

5= Agree Strongly, 4=Agree Somewhat, 3= Not Sure, 2=Disagree Somewhat, and 1=Disagree

- _____ 1. Most of my courses have been intellectually stimulating.
- _____ 2. I am satisfied with my academic experience at this university.
- _____ 3. I am more likely to attend a cultural event (e.g., a concert, lecture, or art show) now compared to few months ago.
- _____ 4. I am satisfied with the extent of my intellectual development.
- _____ 5. In addition to required reading assignments, I read many of the recommended books in my courses.
- _____ 6. My interest in ideas and intellectual matters has increased since starting classes.
- _____ 7. I have an idea about what I want to major in.
- _____ 8. This year my academic experience has positively influenced my intellectual growth and interest in ideas.
- _____ 9. Getting good grades is important to me.
- _____ 10. I have performed academically as well as I anticipated.
- _____ 11. My interpersonal relationships with students have positively influenced my intellectual growth and interest in ideas.
- _____ 12. I have developed close personal relationships with other students.
- _____ 13. The student friendships I have developed have been personally satisfying.
- _____ 14. My personal relationships with other students have positively influenced my personal growth, values, and attitudes.
- _____ 15. It has been easy for me to meet and make friends with students.
- _____ 16. I am satisfied with my dating relationships.
- _____ 17. Many students I know would be willing to listen and help me if I had a personal problem.
- _____ 18. Most students at this university have values and attitudes similar to mine.
- _____ 19. I am satisfied with the opportunities to participate in organized extracurricular activities at this university.
- _____ 20. I am happy with my living/residence arrangement.
- _____ 21. I am satisfied with my opportunities to meet and interact informally with faculty members.
- _____ 22. Many faculty members I have had contact with are willing to spend time outside of class to discuss issues of interest and importance to students.
- _____ 23. I have developed a close, personal relationship with at least one faculty member.
- _____ 24. My non-classroom interactions with faculty members have positively influenced my intellectual growth and interest in ideas.

- _____ 25. My non-classroom interactions with faculty members have positively influenced my personal growth, values, and attitudes.
- _____ 26. My non-classroom interactions with faculty members have positively influenced my career goals and aspirations.
- _____ 27. Many faculty members I have had contact with are genuinely outstanding or superior teachers.
- _____ 28. Many faculty members I have had contact with are genuinely interested in students.
- _____ 29. Many faculty members I have had contact with are genuinely interested in teaching.
- _____ 30. Many faculty members I have had contact with are interested in helping students grow in more than just academic areas.
- _____ 31. It is important to me to graduate from college.
- _____ 32. It is important to me to graduate from this university.
- _____ 33. I am confident that I made the right decision in choosing to attend this university.
- _____ 34. I will most likely register at this university this fall.