

1-1-2017

Psychosocial Predictors Of College Student Athlete Burnout And Engagement

Brigid Byrd
Wayne State University,

Follow this and additional works at: https://digitalcommons.wayne.edu/oa_dissertations

 Part of the [Kinesiology Commons](#)

Recommended Citation

Byrd, Brigid, "Psychosocial Predictors Of College Student Athlete Burnout And Engagement" (2017). *Wayne State University Dissertations*. 1787.

https://digitalcommons.wayne.edu/oa_dissertations/1787

This Open Access Dissertation is brought to you for free and open access by DigitalCommons@WayneState. It has been accepted for inclusion in Wayne State University Dissertations by an authorized administrator of DigitalCommons@WayneState.

**PSYCHOSOCIAL PREDICTORS OF COLLEGE STUDENT ATHLETE BURNOUT
AND ENGAGEMENT**

by

BRIGID BYRD

DISSERTATION

Submitted to the Graduate School

of Wayne State University,

Detroit, Michigan

in partial fulfillment of the requirements

for the degree of

DOCTOR OF PHILOSOPHY

2017

MAJOR: KINESIOLOGY

Approved By:

Advisor

Date

DEDICATION

I dedicate my dissertation to my loving and supportive family, especially my Husband Greg, my daughter Evelyn, my Mom Lynn, Dad Dennis, and Sister Shannon. I also dedicate this dissertation to my Grandparents, Don and Jane Grill and Warren and Doris Nash, who would have been delighted to have an academic experience like mine.

ACKNOWLEDGEMENTS

I would like to first and foremost acknowledge my amazing major advisor, Dr. Jeffrey Martin, for his open mind and continuous advice. He has been a supportive cornerstone of my graduate education experience. I would also like to acknowledge Dr. Tamara Hew-Butler who first opened my eyes to the wonderful world of research and has continued to be a positive influence in my growth and development not only as a life-long learner and researcher, but as a substantial human being. I would also like to acknowledge my dissertation committee members, Dr. Whitney Moore and Dr. Noel Kulik, for their assistance in my dissertation journey. Lastly, I would like to acknowledge the dedicated and talented college coaches and college student athletes from Oakland University who made my dissertation possible!

TABLE OF CONTENTS

Dedication	ii
Acknowledgement	iii
List of Tables	vi
List of Figures	vii
CHAPTER 1 INTRODUCTION	1
Need for the Study	2
Theoretical Perspective	4
CHAPTER 2 REVIEW OF LITERATURE	6
Challenges of College Student Athletes	7
Benefits of College Student Athletes	34
Self-Determination Theory and College Student Athletes	40
Coaches, Teammates and Psychosocial Outcomes College Student Athletes	41
College Student Athletes and Academic Engagement and Burnout	44
Pilot Study	47
CHAPTER 3 METHODOLOGY	51
Research Questions	51
Participants	52
Sample Size	52
Procedure	52
Variables	53
Instruments	54
Data Analysis	57
CHAPTER 4 RESULTS	61

Introduction	61
Preliminary Analysis	61
Participant Characteristics	62
Descriptive Results	66
Correlation Results	69
Multiple Regression Results for each Research Question	75
Research Question 1	75
Research Question 2	77
CHAPTER 5 DISCUSSION, CONCLUSIONS, AND APPLICATION	81
Summary of the Study	81
Conclusions and Discussion	82
Research Question 1	82
Research Question 2	87
Generalizations	89
Limitations	90
Recommendations for Future Study	92
Recommendations for Application	93
Appendix A: Letter of Approval from Human Investigation Committees	96
Appendix B: Consent Form	97
Appendix C: Research Instruments	105
References	121
Abstract	133
Autobiographical Statement	135

LIST OF TABLES

Table 1: Ranges, Means, Standard Deviations, Skewness, Kurtosis, Alpha's, and Pearson Product Correlations of Variables	74
Table 2: Multiple regression results predicting Athlete Burnout	76
Table 3: Multiple regression results predicting Athlete Engagement	77
Table 4: Multiple regression results predicting Student Burnout	79
Table 5: Multiple regression results predicting Student Engagement	80

LIST OF FIGURES

Figure 1: Multiple Regression 1	59
Figure 2: Multiple Regression 2	59
Figure 3: Multiple Regression 3	60
Figure 4: Multiple Regression 4	60
Figure 5: Characteristics of Participants: Gender	63
Figure 6: Characteristics of Participants: Race	64
Figure 7: Characteristics of Participants: Academic Standing	64
Figure 8: Characteristics of Participants: Competition Status	65
Figure 9: Characteristics of Participants: Sport	65
Figure 10: Characteristics of Participants: Athletic Scholarship Status	66

CHAPTER 1 INTRODUCTION

College represents a time for many young adults to explore and develop an independent identity while facing challenges concerning academics, social networks, and future careers (Santrock, 2014). College student-athletes, of which there are over 460,000 in the National Collegiate Athletic Association (NCAA, 2015a), represent a unique population in that they face additional challenges including maintenance of a high level of physical training and balancing academic and athletic performances (Ford, 2007). For example, NCAA Division I college student athletes must maintain 6 credit hours per academic semester (NCAA, 2016a) and a grade point average (GPA) of at least 2.00 at the participating university (OU, 2016) in order to remain eligible to participate in their sport. Additionally, NCAA guidelines allow participation in sport activities (e.g., practice or competition) up to 4 hours per day, which does not include activities such as mandatory study halls or travel to and from competition (NCAA, 2016b). The challenges and benefits of college student athletes are unique and a well-rounded university experience, athletically and academically, is essential for optimum outcomes. Hence, the study of psychosocial predictors of college student athlete burnout and engagement in both athletics and academics is of a great importance.

Researchers (Adler & Adler, 1985; Miller & Kerr, 2002) have stated that the academic and athletic outcomes of college student athletes are in a competitive relationship in which success in one or both domains may suffer due to the need to compromise and negotiate between the 2 domains. In contrast, Potuto and O'Hanlon (2007) found that Division IA college student athletes' reported a generally positive college experience from which they believed their athletic experiences taught them important values and skills which transferred to other areas of their college lives including academics. These findings were true across various groups of student athletes (e.g., individual/team athletes, males/females, revenue/non-revenue sports). However, it

is possible that these results would differ with Division II or III college student athletes. These divisional differences may exist due to greater athletic time demands at DI universities verses DII or DIII universities. Academic eligibility standards may also be greater at DI universities due to the availability of greater quality athlete academic services as compared to other divisions. Additionally, coaches at DI institutions compared to DII or DIII institutions are generally paid more thus the pressure to win and succeed in the athletic arena is greater which may also cause differences in college experiences of college student athletes. There is a need for further study of college student athletes in order to examine important predictors of positive and negative athletic and academic outcomes such as student athlete burnout and engagement. Hence, the purpose of the current study was to examine important college student athlete relationships including coaches and teammates in order to predict student athlete burnout and engagement.

Dissertation Structure

The rest of the dissertation is structured as follows: First, the need for this study is discussed. Second, the theoretical perspective for the current study, Self-Determination Theory is discussed. Next, a literature review on the past and current state of research examining college student athletes, specifically the unique challenges and benefits associated with college varsity sport participation is discussed. Fourth, study variables and the current state of the research regarding these variables in the college student athlete population are discussed. Next, research questions and hypotheses are provided. Next, methodology is discussed. Lastly, results and discussion, conclusions and applications are discussed.

Need For The Study

This study is important as I have discovered salient psychosocial predictors of burnout and engagement in both athletic and academic domains for college student athletes. Furthermore,

because college student athletes who become professional athletes is limited (NCAA, 2015b) student's academic outcomes are critical in pursuing careers and thriving after college graduation. Scott and colleagues (2008) found that college athletes had lower grade GPAs during competitive season compared to out of competitive season. Additionally, athletes participating in the highest time demanding sports (e.g., baseball, football, basketball, softball) had the greatest differences in in-season verses out-of-season GPAs and the lowest graduation rates (Scott, Paskus, Miranda, Petr, & McArdle, 2008).

Furthermore, many college student athletes face the challenge of continuing physical activity (PA) behaviors post collegiate athletic careers (Witkowski & Spangenburg, 2008). Sorenson and colleagues (2015) found that former NCAA Division I college athletes compared to non-athletes had lower exercise volume and less compliance with ACSM exercise recommendations. This was representative of a significant difference in PA participation for former college athletes compared to current college athletes but not former and current non-athletes (Sorenson, Romano, Azen, Schroeder, & Salem, 2015). These low PA levels post college sport participation may be due to the large amount of college athletes who experience athlete burnout. Previous research on college student athletes has neglected the examination of athletic and academic outcomes simultaneously. Hence, in the current study I address this shortcoming by examining both academic and athletic burnout and engagement in order to provide information regarding a well-rounded college student athlete. This information could potentially inform interventions created to increase college student athlete well-being in multiple domains of life.

Theoretical Perspective

Self-determination theory (SDT; Deci & Ryan, 1985) states that an individuals' behavior is self-determined if their motivation for their behavior is intrinsic. Within SDT, the organism

integration theory (OIT) states that motivation runs along a continuum as follows: amotivation, external regulation, introjected regulation, identified regulation, integrated regulation, and intrinsic motivation. External, introjected, identified, and integrated regulations are regulatory styles of extrinsic motivation. Amotivation represents non-self-determined behaviors and a lack of intention, value, competence and sense of control of a behavior. For example, an athlete who is amotivated may experience athlete burnout as they no longer value or feel competent in their sport. Extrinsic motivation varies from amotivation as it consists of intentional behavior; however, this behavior is regulated by varying degrees of external forces. External regulation is represented by an athlete who shows up to practice in order to avoid punishment or receive rewards from external sources. Introjected regulation represents a somewhat external locus of causality and can be seen when an athlete is ego-involved and completes tasks in order to feel superior to other teammates. Identified regulation represents a somewhat internal locus of causality and can be seen when an athlete values their sport and they attend practices because it is of personal importance. Integrated regulation represents an internal locus of causality and is the closest form of extrinsic motivation to intrinsic motivation. Integrated regulation reflects an athlete who feels their sport participation is a part of who they are and is congruent with their sense of self. Lastly, intrinsic motivation represents self-determined behavior which is seen through an athlete who participates in their sport because they are genuinely interested, engaged, and satisfied by their sport participation (Deci & Ryan, 2002).

There are also 3 types of intrinsic motivation unique to sport that exist: intrinsic motivation to know, intrinsic motivation toward accomplishments, and intrinsic motivation to experience stimulation. An athlete who has intrinsic motivation to know participates in their sport because they experience pleasure in learning and exploring new skills and techniques. An

athlete who has intrinsic motivation toward accomplishments participates in their sport because they feel pleasure in accomplishing difficult skills. An athlete who has intrinsic motivation to experience stimulation participates in their sport because it stimulates the senses and kinesthetically feels good (Pelletier, Fortier, Vallerand, Tuson, & Briere, 1995).

When an individual's behavior is self-determined due to intrinsic motivation, according to basic needs theory (BNT), the innate, global basic needs of autonomy, competence, and relatedness are satisfied. The basic need of autonomy is the need to feel that behaviors are an act of one's volition. The basic need of competence is the need to feel capable of mastery. The basic need of relatedness is the need to feel one belongs and is cared for by significant others (Vansteenkiste, Niemiec, & Soenens, 2010). Through the satisfaction of these 3 basic needs, self-determined motivation and psychological well-being can be attained. Basic need satisfaction can occur in multiple contexts (i.e., academics, athletics).

A third sub-theory within SDT, cognitive evaluation theory (CET), states that social environmental dimensions are capable of supporting basic need satisfaction. A context can be autonomy supportive or controlling. An autonomy supportive context allows an individual to have control over their own choices, while a controlling context does not. An autonomy supportive context is related to more self-determined motivation (Deci & Ryan, 2002). For example, an autonomy supportive, rather than a controlling, social environment would support the basic need satisfaction of autonomy (Vansteenkiste et al., 2010). Within a CET framework, athlete perceptions of social environments created by coaches and teammates will be examined in the current study as predictors of student athlete burnout and engagement. Research regarding SDT and college student athletes will be discussed in a later section.

CHAPTER 2 REVIEW OF LITERATURE

Challenges and Benefits of College Student Athletes

The purpose of this section is to examine the current literature regarding the unique challenges and benefits associated with college sport participation. In addition to the challenges that non-athlete young adults face during college such as developing an independent identity, adapting to greater academic demands, developing new social networks, and formulating future career paths; college student athletes experience a myriad of other challenges (Carodine, Almond, & Gratto, 2001; Parham, 1993; Santrock, 2014). These additional challenges include balancing academic and athletic participation, managing success and failure in both academic and athletic domains. Managing physical and psychological health in order to prevent injury and remain healthy for competition, fulfilling obligations in many demanding relationships such as with coaches, teammates, and professors, being isolated from “mainstream” social experiences, and managing the termination of an athletic career (Carodine et al., 2001; Fletcher, Benschoff, & Richburg, 2003; Parham, 1993; Watt & Moore, 2001).

Along with additional challenges college student athletes encounter, this population also experiences added benefits through their college athletic participation. These added benefits include financial support from athletic scholarships, psychosocial well-being such as feelings of empowerment and self-esteem, becoming prepared for life challenges and future career endeavors (Blinde, Taub, & Han, 1993; Chalfin, Weight, Osborne, & Johnson, 2014; Singer, 2008; Watt & Moore, 2001). The unique challenges and benefits college student athletes experience beyond those experienced by college non-athletes make college student athletes a unique subset of the young adult population, thus warranting much study and examination.

Hence in the next section I discuss the extant literature regarding specific unique challenges and benefits of college student athletes.

Challenges of College Student Athletes

In the current section I first discuss the challenge of transitioning to college. Next, I discuss the unique challenge for college student athletes of balancing academic and athletic endeavors. This discussion reveals the discrepancies which exist in the literature regarding whether college athletic participation has a negative or positive effect on academic pursuits. Next, I discuss the challenge of managing physical and psychological health in order to prevent injury and remain healthy for competition; additionally, the challenge of rehabilitating from injury is discussed. Substance use in order to manage stress is also discussed. Fourth, the challenge of fulfilling obligations in many demanding relationships such as with coaches, teammates, and professors is discussed. I also discuss the challenge of being isolated from “mainstream” social experiences. Lastly, I discuss the challenge of managing the transition out of college that occurs at the termination of an athletic career.

Transition to College

The transition to college can be associated with many challenges including living independently from caretakers for the first time, creating new social relationships, and managing academic courses of great difficulty. Homesickness can be a distress that many students face when living independently for the first time during the transition to college. Homesickness is defined as an intense longing for home that is associated with depressed mood and negative physical health outcomes (Smith, Hanrahan, Anderson, & Abbot, 2015).

Smith and colleagues (2015) assessed residential athletes’ personality, self-esteem, and coping strategies relative to homesickness of the Australian Institute of Sport (AIS). AIS athletes, similar to college student athletes, were transitioning to living away from home while practicing and competing in their sport. Athletes had a mean age of 17.62 years and participated

in basketball, soccer, volleyball and netball. A multiple regression revealed the personality factor of neuroticism explained 18.7% of the variance in predicting homesickness. In an additional regression analysis, low self-esteem explained 18.1% of the variance in predicting homesickness. In a separate regression, the coping mechanism of mental escape explained 30.7% of the variance in predicting homesickness. Mental escape is an avoidance-oriented coping strategy and is considered maladaptive as a homesick individual is still focusing on the past environment and a genuine interest for the new environment is not formed (Smith et al., 2015). Thus, an individual who is high in neuroticism, low in self-esteem, and uses avoidance-oriented coping strategies is likely to experience homesickness during their transition to a new environment, such as a freshmen year away at college. The transition to college can also be challenging due to the adjustment of increasing demands from both academic and athletic participation and changing social relationships which are discussed next.

Academic and Athletic Participation

College student athletes have the challenge of maintaining a high level of physical training and balancing academic and athletic performances (Ford, 2007). For example, NCAA Division I (DI) college student athletes must maintain 6 credit hours per academic semester (NCAA, 2016a) and a GPA set by their university in order to remain eligible to participate in their sport. Additionally, NCAA guidelines allow participation in sport activities (e.g., practice or competition) up to 4 hours per day or 20 hours per week, which does not include activities such as mandatory study halls or travel to and from competition (NCAA, 2016b). A survey of 21,000 NCAA DI college student athletes revealed that college students were spending over 40 hours per week participating in sport related activities (Wolverton, 2008). For example, the Michigan State University (MSU) Men's basketball team, a NCAA DI team, travelled as far as

California in November 2015 for 3 competitions over a 4 day period. This travel time was additional to the 20 hours per week of sport participation by the NCAA and likely required student athletes to miss academic experiences (Michigan State, 2016).

Researchers (Adler & Adler, 1985; Miller & Kerr, 2002) have stated that the academic and athletic performances of college student athletes are in a competitive relationship in which success in one or both domains may suffer due to the need to compromise and negotiate between the 2 domains. For example, an athlete may decide to skip class in order to catch up on sleep due to extreme tiredness from two-a-day workouts during their sport season. In contrast, Potuto and O'Hanlon (2007) found that NCAA DIA college student athletes' reported a generally positive college experience from which they believed their athletic experiences taught them important values and skills which transferred to other areas of their college lives including academics. These findings were true across various groups of student athletes (e.g., individual/team athletes, males/females, revenue/non-revenue sports). Literature regarding the study of academic outcomes of college student athletes is presented next.

Scott and colleagues (2008) tested the assumption that college student athletes fare better academically during their competitive season (in-season) compared to out of competitive season (out-of-season) among NCAA DI, DII, and DIII college student athletes. Academic data was collected as GPA and credits taken/attempted at DII and DIII schools for 1 academic year and DI schools for 2 academic years. Student athletes participating in multiple sports (i.e., track and field and cross country) were excluded as in-season/out-of-season status is not clear. Eight DIII schools provided data on 2,830 student athletes (males = 1,776) and findings revealed that in-season and out-of-season GPA differences were statistically significant ($p < .01$) as average in-season GPA was 2.93 and average out-of-season GPA was 3.00. Further, student athletes

attempted fewer credits in-season compared to out-of-season. Ninety-two schools provided data on 11,815 (57% male) student athletes and findings had a similar pattern to DIII outcomes in that in-season GPA was statistically significantly lower than out-of-season GPA ($p < .01$) and took 0.4 credits less in-season compared to out-of-season.

All NCAA DI schools provided data on 50,099 student athletes and findings had a similar pattern to DII and DIII schools with in-season GPA being significantly lower than out-of-season GPA and less credits taken in-season as well. Stated differently, NCAA student athletes, regardless of division, had a lower average GPA during their competitive season even though they were taking fewer credits. Overall, the results negated the prior assumption and showed that student athletes had better academic performance out-of-season compared to in-season. This was especially relevant for sports with increased in-season requirements such as DI football, basketball, baseball, and softball (Scott et al., 2008). These findings suggest that during competitive season, college student athletes are unable to balance academic and athletic commitments successfully as compared to off-season.

Milton and colleagues (2012) examined grade point average (GPA) discrepancies between scholarship and non-scholarship college student athletes and male and female college student athletes. A scholarship athlete was defined as any athlete receiving any amount of athletic financial aid. Four-hundred and fifty five student athletes were examined of which 265 were scholarship athletes (301 male) at a NCAA DII private university. A chi-square test was used to examine significant differences between groups (scholarship vs. non-scholarship, scholarship male vs. scholarship female, non-scholarship male vs. non-scholarship female). Findings revealed a significant difference in GPA between scholarship and non-scholarship student athletes. Scholarship student athletes were more likely than non-scholarship student

athletes to have a GPA of 3.0 or above. Scholarship athletes had an average GPA of 3.089 while non-scholarship athletes had an average GPA of 2.944. Findings also showed a significant difference between female and male scholarship athletes in that scholarship female athletes were more likely to have a GPA of 3.0 or higher than scholarship male athletes. Further, the comparison between non-scholarship male and female athletes revealed a significant finding in the same manner as the comparison between scholarship male and female athletes. These results suggest that overall scholarship athletes fare better than non-scholarship athletes and female student athletes fare better than male student athletes (Milton, Freeman, & Williamson, 2012).

Rubin and Rosser's (2014) study of academic performance comparisons between scholarship and non-scholarship college student athletes revealed contrasting results to those of Milton and colleagues' (2012) study. Rubin and Rosser (2014) examined demographic variables such as gender, race, team type (individual/team), and sport type, cumulative GPA, and time-to-degree (semesters) of scholarship and non-scholarship student athletes from 8 NCAA DIA universities. Sport teams examined included Men's and Women's Basketball, Women's Cross Country and Track and Field, Men's Golf, Football, Women's Soccer, Softball, Women's Tennis, and Women's Volleyball and consisted of 593 student athletes (372 or 62.4% scholarship athletes; 42.7% male). The mean GPA for scholarship student athletes was 2.91 and the mean GPA for non-scholarship student athletes was 2.96. Only 389 student athletes had time-to-degree data available, from this scholarship athletes had a mean of 9.34 semesters to graduate while non-scholarship athletes at a mean of 8.95 semesters to graduate (Rubin & Rosser, 2014). Stated differently, non-scholarship student athletes at DIA institutions had better cumulative GPAs and took less semesters to graduate compared to their scholarship athlete peers. Rubin and Rosser's (2014) findings and Milton and colleagues (2012) findings show the discrepancy that

exists in the understanding of outcome effects of athletic scholarship status among college student athletes.

Robst and Keil (2000) examined academic success, GPA and ease of course load, and graduation rates of college student athletes compared to non-athletes at a NCAA DIII institution (Binghamton University (BU), NY). Transfer and non-transfer (60%) student status was also examined. All undergraduate students enrolled in 12 credits per academic year from 1990-1996 were included ($N = 9300$). GPAs for non-transfer student athletes (3.04) were significantly lower than non-transfer non-athletes (3.12). However, ease of course load was lower for non-transfer athletes as well, signifying a more difficult course load compared to non-transfer non-athletes. Further, student athletes entered college with lower SAT verbal scores which may signify a lesser academic readiness and ability at the start of college compared to non-athletes. This trend was also apparent for transfer student-athletes compared to transfer non-athletes.

The federal government states that 12 semesters or 6 years to graduation is successful. However, students who take a full course load every semester should graduate in 4 years or 8 semesters. The analysis of graduation rates included only non-transfer and full-time students at BU. Findings revealed that student athletes were significantly ($p < .05$) more likely to graduate at the 4 (81.4%; 65.6%), 5 (88.4%; 76.6%), and 6 (88.4%; 78.4%) year time points compared to non-athletes. Students, regardless of athlete status, who took more credits during their freshman year with a higher GPA were more likely to graduate in 4 years. More simply, student athletes had a higher graduation rate than non-athletes and in general had comparable GPAs when considering ease of course load. The researchers speculated that college student athletes' demanding schedules provide structure to better manage their time which may be the reason they had higher graduation rates than non-athletes (Robst & Keil, 2000).

Rishe (2003) examined the impact of athletic success of college student athletes on college graduation rates. Graduation rates were determined based on finishing an undergraduate degree in 6 years. Transfer students were not included in the analyses. Two-hundred-fifty-two DI schools were included and the graduation rates of undergraduate non-athlete students and student athletes were compared. Findings revealed the college student-athlete graduation rate (58.15%) compared to the undergraduate student graduation rate (54.62%) was statistically greater. The highest graduation rate compared to all other subgroups was that of White female athletes (68.52%) at DI schools (Rishe, 2003). This may be due to male athletes having more pressure to perform athletically than female athletes. Additionally, male athletes are more likely to be involved in revenue sports such as football or basketball which also increases pressure to perform athletically, while decreasing time to spend on academic pursuits. Interestingly, Rishe (2003) also found that athletic participation for Black female and male athletes had a strong positive effect on graduation rates compared to the Black non-athlete undergraduate population.

Aries and colleagues (2004) compared college student athletes and non-athletes academic performance at highly selective institutions (i.e., Ivy League) over 4 years using 5 waves of identical surveys. The starting sample was 1061 students at 2 institutions, this sample size decreased throughout the 4 year study. Academic variables collected included SAT scores, grades, time spent studying in a week, self-assessments of academic abilities, and commitment to athletics (10+ hours/week participating in athletics). Data were analyzed in a cross-sectional manner for the first and last wave of data due to the significant decrease in subject participation across the 4 year study. High-commitment athletes had lower SAT scores and spent less time studying per week compared to non-athletes. Academic self-assessments revealed high-commitment athletes reported greater difficulty being taken seriously by professors, earning

good grades, and finding time to study. These difficulties increased from the start to the end of the 4 year study.

A regression model revealed that final grades of students were significantly predicted by gender, race, and SAT scores, but not athlete commitment levels. Being female was a significant predictor of better final grades, while being African-American was a significant predictor of worse final grades and SAT scores were significant predictors of final grades with greater SAT scores predicting better final grades. However, high commitment athlete status or participating in athletics 10 hours or more a week was not a significant predictor of final grades in comparison to non-athletes with similar SAT scores. These findings show that although highly committed college student athletes at highly selective institutions report greater difficulties, their final grades were not significantly predicted by their athletic status (Aries, McCarthy, Salovey, Banaji, 2004).

In conclusion, the research that exists concerning the effects of athletic participation and success on academic success of college student athletes is inconclusive and requires further study into possible moderating and mediating variables such as gender, sport team, division, and scholarship status. Currently, researchers (Rishe, 2003; Robst & Keil, 2000) found that athletic status is beneficial for graduation rate variables. In other words, college student athletes are more likely than non-athletes to graduate on-time or within 6 years. However, researchers are mixed on whether athletic status is beneficial for academic success measured by GPA or final grades. The research reviewed suggests that the many challenges of being a student athlete can have many ramifications for student athletes' physical and psychological health and that body of research is discussed next.

Physical and Psychological Health

A critical concern many college student athletes are challenged with is the management of their physical and psychological health in order to prevent injury and remain healthy for competition (Parham, 1993). I present Andersen and Williams (1988) stress and injury model as a framework of physical and psychological health in the prediction and prevention of athletic injury (Andersen & Williams, 1988; Williams & Andersen, 1998). Predictors of college student athlete ill-being such as athlete burnout are also discussed. Additionally, coping mechanisms that athlete's use, such as substance abuse (e.g., alcohol, tobacco, illegal substances), in order to deal with stressors such as injury and burnout are discussed.

Optimal physical and psychological health is critical to maintain and improve athletic and academic performance for college student athletes. However, potentially stressful athletic situations may cause athletic injury through stress responses which have various mechanisms including cognitive, psychosocial, and physiological pathways (Andersen & Williams, 1988; Petrie & Hamson-Utley, 2011; Williams & Andersen, 1998). These athletic injuries may have physical and psychological repercussions in a student athlete's life, in extreme cases causing termination of an athletic career (Parham, 1993). Psychological health disparities are highest among young adults, most of who are in college (NCAA Sport Science Institute, 2013). Wolanin and colleagues (2016) found that depression symptoms were present for 23.7% ($N = 465$) of NCAA DI student athletes, with female athletes being at a greater risk of exhibiting depressive symptoms than male athletes (Wolanin, Hong, Marks, Panchoo, & Gross, 2016). Thus, understanding the pathways that exist from a potentially stressful athletic situation to an injury, described in Andersen and Williams (1988) model is essential.

The stress-injury model (Andersen & Williams, 1988) posits that a potentially stressful athletic situation (e.g., championship competition) elicits a stress response. This stress response

is comprised of a cognitive appraisal of the event (e.g., demands, resources, consequences) and a physiological response (e.g., increased muscle tension, narrowed focus). The stress response is also influenced by psychosocial factors such as personality (e.g., locus of control, trait anxiety), history of stressors (e.g., daily life hassles, previous injuries) such as negative teammate interactions or trying to find time to study while having two-a-day practices, and coping resources (e.g., social support, coping skills, medication). The stress response can also be influenced by interventions (e.g., relaxation skills, imagery) an athlete has experienced in order to decrease stress, which could also be considered coping resources once incorporated into an athlete's repertoire frequently. From the stress response an athletic injury may result. All of these factors are at play simultaneously and may effect an athlete's ability to maintain physical and psychological health.

Once an injury is sustained, rehabilitation can also be a physical and psychological challenge for college student athletes (Petrie & Hamson-Utley, 2011). Wiese-Bjornstal and colleagues (1998) proposed a model of an athlete's psychosocial responses to an athletic injury and rehabilitation (Wiese-Bjornstal, Smith, Shaffer, & Morrey, 1998). Overall, an athlete's rehabilitation is determined by appraisal of their injury which elicits an emotional and behavioral response. A positive response to rehabilitation (e.g., adherence to treatment, team support, confidence in recovery) is likely to lead to an optimal recovery, whereas a negative response and low coping skills may lead to a less full recovery. Physiological considerations are also of import during rehabilitation such as adequate rest, adequate nutrition, and functional bodily systems (e.g., endocrine, metabolic) (Brewer, Andersen, & Van Raalte, 2002).

College student athletes face many stressors which may impair their athletic and academic college experiences. Wilson and Pritchard (2005) assessed the differences in perceived

stressors of college student athletes and non-athletes at a NCAA DI institution. Three-hundred-sixty-two undergraduate freshmen were studied (235 = female, 52 = athletes). Results showed student athletes reported more stress than non-athletes on factors including relationship conflicts (e.g., boyfriend's or girlfriend's family), having many responsibilities, not having enough time for adequate sleep, and having substantial demands from extracurricular activities (e.g., sport participation). Non-athletes reported more stress than student athletes regarding finances, educational decisions, social conflict, social isolation, and appearance dissatisfaction. Overall, college student athletes had greater stress from relationships, time management challenges, and pressure from their sport involvement. However, it seems that athletic participation may be protective in preventing financial stress and body dissatisfaction challenges. This may be due to provision of athletic scholarships and extreme physical training which positively influences physical health and appearance (Wilson & Pritchard, 2005).

Another result of athletic stress and injury may be athlete burnout (Gould & Whitley, 2009). Athlete burnout is a psychological concern characterized by 3 factors: emotional and physical exhaustion, reduced sense of accomplishment, and devaluation of one's sport (Raedeke, 1997). Emotional and physical exhaustion is seen when an athlete is emotionally depleted and overextended and physically worn out which can be represented by fatigue or pain that cannot be relieved. A reduced sense of accomplishment can be seen when athlete no longer feels their sport outcomes are successful. For example, a basketball player who scores 14 points in a game may no longer feel this is a success. Lastly, devaluation of one's sport can be seen when an athlete no longer feels their sport participation is important to their sense of self. Raedeke and Smith (2001) developed the Athlete Burnout Questionnaire (ABQ) comprised of these 3 factors and examined relationships between athlete burnout, competitive trait anxiety, sport enjoyment, sport

commitment, and self-determined motivation of DI and DII college student athletes ($N = 208$). The factors of ABQ were positively correlated with trait anxiety ($r = .14 - .46$) and amotivation ($r = .31 - .64$). Intrinsic motivation ($r = -.22$ to $-.51$), enjoyment ($r = -.40$ to $-.61$), and commitment ($r = -.37$ to $-.76$) were negatively correlated with the factors of athlete burnout. Thus, an athlete high in trait anxiety, lacking motivation, lacking enjoyment for their sport, and lacking commitment to their sport may be at risk for or may already be experiencing some, if not all 3 factors, of athlete burnout (Raedeke & Smith, 2001).

Unfortunately, in order to deal with stressors, such as injury or feelings of athlete burnout, some college student athletes take part in substance use (Green, Uryasz, Petr, & Bray, 2001). The prevalence of risk taking behaviors such as substance use like alcohol use and drug use (Yusko, Buckman, White, & Pandina, 2008; Ford, 2007; Wahesh, Milroy, Lewis, Orsini, & Wyrick, 2013) among college student athletes is greater than among college non-athletes. This may be due to greater time demands and stress felt by college student athletes and a culture created by various sport teams of pressure to use alcohol and drugs. Green and colleagues (2001) examined substance use of NCAA DI, DII, and DIII institutions. Nine-hundred-ninety-one institutions were invited to participate, of that 637 did which provided data from 13,914 student-athletes. Athletes were asked to report past 12 month substance use of 8 categories of substances: alcohol, amphetamines, anabolic steroids, crack/cocaine, ephedrine, marijuana, hallucinogens, and smokeless tobacco. During the past year, 80.5% of the student athletes reported alcohol use, 28.4% reported marijuana use, and 22.5% reported the use of smokeless tobacco. Anabolic steroid use was only reported by 1.1% of the student-athletes; however, of these athletes 32.1% received these steroids from a doctor other than the designated team doctor. Overall, substance use was greatest at DIII institutions compared to DI and DII institutions and among Caucasian

student athletes compared to student athletes of all other ethnicities (Green et al., 2001). This may be due to a sense of decreased monitoring of substance use at DIII institutions compared to DII and DI institutions. It is important to be aware that actual substance use may be greater than reported substance use as substance use is designated as a negative behavior and may have negative repercussions if reported by student athletes.

Risk taking behaviors. Risk taking behaviors of college student athletes has been examined extensively. Such risk taking behaviors that have been assessed include alcohol use, drug use, and risky sexual behaviors. Specific findings regarding risk taking behaviors, specifically substance use and sexual behavior, of college student athletes are described next.

Substance use. Alcohol use is operationalized as binge drinking or hazardous drinking, which for males is considered 5 or more drinks per sitting and for females as 4 or more drinks per sitting (Ford, 2007; Yusko et al., 2008). Drug use is operationalized as use of marijuana or illicit drugs (e.g., crack cocaine, barbiturates, amphetamines, tranquilizers, heroin, LSD, hallucinogens, or ecstasy; Ford, 2007) and performance enhancing drugs, weight-loss drugs, and nutritional supplements (Yusko et al., 2008).

Yusko and colleagues (2008) assessed 392 college student athletes and 504 college non-athletes divided into separate male and female data sets ($n = 418$; $n = 475$) in order to compare substance use behaviors of sex-matched student athletes and non-athletes. A 30 minute survey assessment was completed by participants and included demographic variables of age, GPA, sex, ethnicity, school standing, school status, SAT scores, fraternity or sorority membership, and living situation. Substance use variables included frequency and quantity of alcohol use, drug use (e.g., tobacco, marijuana, designer drugs, performance enhancing drugs, and nutrition

supplements) and timing of use (e.g., during the past year, past 2 weeks, lifetime, student athlete in-season or off-season/non-athlete during semester).

Male athletes and non-athletes were compared and female athletes and non-athletes were compared in analyses which revealed significant differences between male and female student athletes and non-athletes. Male student athletes reported a greater amount of heavy drinking episodes during the past year and during high school compared to non-athletes. Conversely, female student athletes compared to female non-athletes reported consumption of significantly less alcohol over the past month, and of less heaving drinking episodes in the past 2 weeks and during high school. Male student athletes also had greater use of performance enhancing drugs, nutritional supplements, and smokeless tobacco than male non-athletes, while non-athletes had greater use of cigarettes, hallucinogens, designer drugs, and other drugs during their lifetime compared to male athletes.

Similarly, female student athletes were more likely to use performance enhancing drugs and nutritional supplements than non-athletes. However, female non-athletes reported higher use of weight-loss products, cigarettes, designer drugs, and marijuana than female student athletes. Both female and male student athletes reported higher social drug use during the off-season. In summary, the pattern of results suggests that males are more likely to take part in the use of alcohol and drugs than females. Researchers speculated that social differences between student athletes and non-athletes may cause risk taking behaviors such as alcohol and drug use to be more prevalent among student athletes, although female athlete participation may be a protective factor in-season (Yusko et al., 2008). These social differences in student athletes compared to non-athletes may include an increased sense of pressure to fit in with fellow athletes in order to be a part of the team therefore student athletes engage in social drug and alcohol use, as well as

an increased pressure to perform athletically thus using performance enhancing drugs is more accepted by peers. Non-athletes do not have comparable social pressures unless they belong to fraternities or sororities or other university organizations where unhealthy norms may exert a negative influence.

Ford (2007) used data from the 1999 Harvard School of Public Health College Alcohol Study (CAS) to compare differences of substance use behaviors between various college sport/team affiliations. Substance use was classified as alcohol use or illicit drug use and scored dichotomously (yes or no). Eight different sport/team affiliations were examined: football, volleyball, soccer, swimming/diving, basketball, hockey, basketball/softball, and running. Control variables included race, ethnicity, age, marital status, Greek affiliation, and GPA. The sample included 2,316 college student athletes representative of the U.S. college student athlete population.

Chi-square analyses revealed that male athletes who played hockey (75.4%) and baseball (64.6%) reported binge drinking behaviors, while soccer athletes (47.1%) and runners (40.9%) reported less binge drinking behaviors than all other male sports teams examined. Binge drinking for males is considered 5 or more drinks per sitting and for females as 4 or more drinks per sitting. Male hockey athletes also reported more marijuana use (38.5%) while basketball players and runners reported less marijuana and illicit drug use than all other male sports teams examined. Female athletes who played soccer reported greater binge drinking behaviors (46.9%), marijuana use (37.8%), and other illicit drug use (23%), while runners reported less binge drinking (26.6%) and swim/dive athletes reported less marijuana use (16.5%) and illicit drug use (4.9%). Logistic regression analyses revealed that male hockey athletes were more likely to report binge drinking and use of marijuana, basketball athletes were less likely to report

marijuana and illicit drug use, and runners were less likely to report binge drinking and marijuana use compared to other male athletes. Regarding female athletes, soccer athletes were more likely to report binge drinking, marijuana and illicit drug use compared to other female athletes. These findings suggest that differences between various sport/team affiliations may be a factor that contributes to binge drinking, marijuana use, and illicit drug use (Ford, 2007). The greatest teams at risk are men's hockey, baseball, and women's soccer and the teams least at risk are men and women runners, men and women swim and dive, and men's soccer.

Wahesh and colleagues (2013) assessed a predictive model of hazardous drinking behaviors in a convenience sample of 63 first-year college-athletes (56% female; 62% Caucasian; M age = 18.62 years). Questionnaires were administered to collect information regarding ethnicity, age, competitive season status, frequency of drinking and heavy drinking and number of drinks in a day (AUDIT-C), consequences of alcohol consumption, and motives for drinking (positive reinforcement, team/group, sport-related coping). Hazardous drinkers were categorized as producing scores equal to or greater than 5 out of 12 on the AUDIT-C, in the current sample 19 student athletes were hazardous drinkers (AUDIT-C risk status). Hazardous drinking is defined as exceeding 14 drinks for males or 7 drinks for females in a week or exceeding 4 drinks for males or 3 drinks for females in one sitting at least once a month (Wahesh et al., 2013).

Independent samples t-tests revealed that the hazardous drinker sub-group had significantly higher motives for drinking and negative psychosocial consequences than non-hazardous drinkers. Examples of negative psychosocial consequences are decreased motivation to attend class or practice and in extreme cases memory loss due to excessive alcohol consumption. There were no statistical differences by gender, age, ethnicity or season status. In

a logistic regression, negative psychosocial consequences, sport-related coping motives, and positive reinforcement motives significantly predicted 64.2% of the variance in the outcome variable of being a hazardous drinker (AUDIT-C risk status). An example of a sport related coping motive is drinking to help deal with poor athletic performances. Conversely, an example of positive reinforcement is drinking to celebrate a athletic victory. Wahesh and colleagues (2013) concluded that with nearly 1/3 of their participants categorized as hazardous drinkers. Further understanding of motives and predictors of college student athlete drinking behavior is essential to the implementation of successful intervention programs.

Sexual behavior. Sexual behavior is operationalized as vaginal sex or oral sex participation and number of sexual partners (Moore, Berkley-Patton, & Hawes, 2013). Moore and colleagues (2013) assessed the relationships between religiosity, alcohol use, and sex behaviors among 83 college student-athletes (69 % female; 74.6% Caucasian). An online survey methodology was used to collect data. Measures included age, gender, sexual orientation, race, religious denomination, relationship status, religiosity (church attendance and importance of religious beliefs), alcohol use, and sex behavior (oral or vaginal sex and number of partners in past year). Descriptive analyses revealed that 91.6% of student athletes reported religious affiliation while 57.8% reported attending a church service at least once a month and 56.6% reported that their religious beliefs influenced their behaviors. One-fourth of the sample reported never drinking alcohol, while 18% reported drinking 5 or more drinks during the last 2 weeks in 1 sitting. Seventy-one percent and 75% of the sample reported having vaginal sex and oral sex, respectively. The average number of sexual partners in the past year was 2.3 for sexually active student athletes.

Logistic regressions showed that student athletes who reported greater influence from religious beliefs were 69% more likely to report never having oral sex and 98% more likely to report never having vaginal sex. Interestingly, individuals who reported more frequent church attendance were 43% more likely to report having vaginal sex. Moore and colleagues' (2013) findings conflict with previous research (e.g., Davidson, Moore, & Ullstrup, 2004) that stated church attendance was associated with less risky sexual behavior. However, Davidson and colleagues' (2004) sample consisted of all female undergraduates and not college student athletes.

A multiple regression analysis revealed that number of drinks and binge drinking positively predicted number of sex partners while religious influence negatively predicted number of sex partners. Stated differently, student athletes who drank and binge drank frequently had more sex partners than student athletes who engaged in less drinking and less binge drinking. It is possible that increased drinking lowers individuals' inhibitions and their ability to make healthy sexual decisions, thus resulting in an increased number of sexual partners. Moore and colleagues (2013) concluded that religious belief, and not religious service attendance, may be a protective factor against risk taking behaviors such as alcohol use and sexual behavior for college student-athletes.

Summary. Cumulatively, these findings reveal that college student athletes represent a population that has a high prevalence of risk taking behaviors including alcohol use, drug use, and risky sexual behavior. These risk taking behaviors occur at a greater rate among college student-athletes than college non-athletes (Yusko et al., 2008). Possible reasons why greater prevalence for risk taking behaviors among college student-athletes is seen may include existence of a "peer-intensive context" in college athletics in that athletes are exposed

continuously to the same group of peers (i.e., teammates) so they conform to group norms which may consist of participation in risk taking behaviors such as alcohol and drug use (Ford, 2007, p. 372).

The group norm to participate in risk taking behaviors may be greater among male student athletes compared to female student athletes. This may be due to a “macho man” attitude which may exist within male sport teams that may promote the use of illegal substances. Yusko and colleagues (2008) showed that female sport participation may be a protective factor during the competitive season. In season participation of risk taking behaviors among student athletes may decrease due to increased concern for athletic performance outcomes (Yusko et al., 2008). For example, an athlete may be reluctant to go to a party, stay up late, and drink the night before a competition in order to not hinder performance, yet during the off season this is not a concern. However, Wahesh and colleagues (2013) found no significant differences regarding season status for first-year college student-athletes and hazardous drinking behaviors.

Differences in sport/team affiliations also impacted risk taking behaviors as variations in social contexts between sport teams may exist. Ford (2007) reported that male hockey athletes and female soccer athletes reported more risk taking behaviors of binge drinking, marijuana use and illicit drug use. Conversely, basketball athletes and runners reported less participation in these behaviors. These differences may exist due to sport team culture variations. It is possible that certain sport team athletes have greater stress and pressure to perform well, thus leading to greater substance use in attempt to cope with this stress. Additionally, certain sport teams may endorse a normative culture of substance use, while other sport teams endorse a normative culture of anti-substance use (Ford, 2007). As college athletics is a “peer-intensive context” the

normative culture that exists in a specific sport team is likely to have a great impact on individual athletes (Ford, 2007, p. 372).

Additionally, researchers (Moore et al., 2013) found that religiosity differences between college student-athletes effected risk taking behavior participation of alcohol use and sexual behavior. Thus, differences between college student-athletes including sport/team affiliation and religiosity may play an important role in determining the outcome of risk taking behaviors. It is possible that a male college student athlete who is in their non-competitive season, affiliated with a revenue making sport such as hockey or football, does not have strong religious beliefs, and coping with pressure from their team and coaches to perform well during their competitive season may be at a greater risk than other college student athletes to participate in risk taking behaviors such as alcohol use, drug use, and risky sexual behavior.

It is also important to understand the various motivations that college student-athletes possess for participating in risk taking behaviors such as alcohol use. Wahesh and colleagues (2013) determined that sport-related coping (e.g., dealing with a bad athletic performance) and positive reinforcement (e.g., celebrating a good athletic performance) were significant predictors of being a hazardous drinker. These findings highlight the role of athletics in creation of motivation to use alcohol.

In conclusion, college student athletes are at a great risk of physical and psychological health impairments. Physical health and psychological health are inextricably connected and a physical injury may jeopardize psychological well-being, which may have a reciprocal response on physical health of an athlete, and thus athletic performance of a student athlete. Furthermore, student athletes experience different sources of stress than non-athletes regarding pressure to perform athletically at a high level, time management factors, and strain from various

relationships. Research regarding demanding college student athlete relationships is discussed next.

Social Relationships

Fulfilling responsibilities of demanding relationships such as with a coach, teammates, and professors can be an additional challenge college student athletes experience (Parham, 1993). In the current section I first discuss Bandura's social cognitive theory as a framework for the exploration of the effects of social relationships on student athlete outcomes. Then, I discuss specific relationships that student athletes cope with during their collegiate experiences. Last, I discuss the unique challenge student athletes manage of being isolated from mainstream university social experiences due to their sport commitment and participation (Coradine et al., 2001).

Social cognitive theory (Bandura, 1986; Bandura, 2001) states that personal agency and sociocultural influences act and react with each other to create social systems and inform psychosocial outcomes of individuals. Personal agency refers to the student athlete's ability and belief in that ability to behave in a certain way. For example, an athlete who believes they are able to attend class and practice regularly in order to be successful in both domains. In the examination of college student athletes, the sociocultural influences include relationships with coaches, teammates, and professors, as well as university and sport team cultural factors. Thus, within the framework of social cognitive theory I discuss the role social relationships take in the experiences of college student athletes.

Coaches and teammates represent critical social influences in a college student athlete's life. Some coaches and teammates enforce a win at all costs attitude. Unfortunately, this attitude has been shown to impact negative behaviors such as sexual aggression, steroid use, and negative

body image (Watt & Moore, 2001). Czekanski and Turner (2014) examined college student-athlete commitment towards coaches and their team through perceptions of coach-athlete and teammate-athlete dyad relationship qualities. Role fulfillment was also measured. Student-athletes ($N = 149$; 45% male; 35.8% freshman) completed surveys. Structural equation modelling revealed that 86.9% of the variance of athlete commitment to their coaches was explained by quality of the coach-athlete relationship, 13.4% of the variance of athlete commitment to their team was explained by the quality of the teammate-athlete relationship, and 18.9% of the variance of athlete role fulfillment was explained by commitment to the team and coach (Czekanski & Turner, 2014). Czekanski and Turner's (2014) findings show the importance and value college student athletes place on coach and teammate relationships. As such, low-quality relationships, indicated by lack of understanding an athlete's needs or problems, lack of genuine communication, or devaluing an athlete's contributions and potential, have the influence to diminish a student athlete's feelings of commitment and role fulfillment as an athlete and decrease overall well-being.

Traditional views of college student athletes are consistently negative in that many faculty members and non-athlete peers hold a "dumb jock" stereotype of student athletes (Adler & Adler, 1985). Engstrom and colleagues (1995) examined faculty attitudes toward male student athletes at a NCAA D1A public university. Faculty members ($N = 126$; 69% male; 91% White) completed the revised Situational Attitude Scale (SAS) Student-Athlete instrument in which they were asked to respond to personal and social situations regarding non-athletes, revenue and non-revenue student athletes using 10 bipolar adjectives (e.g., happy-sad) on a Likert scale. An example of a situation was, "A student (male basketball player (revenue), wrestler (non-revenue) gets an A in your class." The majority of situations described elicited a more negative attitude

from faculty members toward male revenue and non-revenue student athletes compared to non-athletes, except for the situation of pursuing a slower paced program of study. However, faculty felt similarly negative towards all student groups concerning the situations of withdrawing from school, missing a class, and getting at 2.2 GPA. Overall, the most negative feelings of faculty members were towards male revenue student athletes (e.g., Men's Football or Basketball) compared to female student athletes, non-revenue athletes, and non-athletes (Engstrom, Sedlacek, & McEwen, 1995). These findings are unfortunate as individuals participating in these revenue sports may have entered college the least academically prepared and have the greatest time commitment toward sport, thus these student athletes are in the greatest need of positive support and guidance from academic faculty members.

Ott (2011) examined NCAA DIA institution faculty ($N = 2071$) satisfaction with college athletics on their campuses and if this satisfaction changed in consideration of individual faculty attributes, campus and athletic program characteristics. Results showed that faculty members were satisfied with the academic integrity (62.1%) and level of responsibility (59.9%) of student-athletes. Faculty members were more satisfied with academic factors of college athletics at their institutions when student enrollment was less and the football team graduation rate was higher. Further, faculty who taught student athletes in their classes and held athletics governance positions were more satisfied with the athletic programs at their institutions. However, faculty members were more dissatisfied (36%) than satisfied (21%) with the use of funding to support athletic programs. Additionally, male revenue sport team (Men's Basketball and Football) postseason tournament participation was negatively related to faculty satisfaction (Ott, 2011). Similar to the findings presented by Engstrom and colleagues (1995), Ott (2011) showed that

male revenue student athletes may promote a sense of dissatisfaction among faculty. However, this dissatisfaction may be negated when faculty have direct contact with student athletes.

Yet another challenge college student athletes face is being isolated from “mainstream” social experiences (Cogan & Petrie, 1996; Parham, 1993). Although this may not be perceived as a major challenge, athlete isolation from non-athletes and non-sport related activities due to extreme time commitments to their sport participation decreases the ability of a student athlete to discover and explore alternative pathways once their athletic careers are over. Further, lack of involvement in normal campus activities does not allow for communication between student athletes and faculty or non-athletes which further permeates the negative stereotypes of athletes that exist (Parham, 1993).

In conclusion, college student athletes emphasize the importance of coach and teammate relationships. As such, negative perceptions of such relationships could be cause for concern; as such, further study is warranted in order to promote student athlete well-being. Further, in general institution faculty members hold a negative view of college athletes, especially those participating on revenue sports such as Men’s Football or Basketball. However, this view becomes less negative as faculty members have direct contact with student athletes showing that the stigma of the “dumb jock” can be negated through time and effort. The challenge of managing the various demanding relationships with coaches, teammates, and faculty, as well as feeling left out of “mainstream” social experiences during college, are serious considerations for researchers as they continue the exploration of college student athletes’ lives. All of the above factors also have ramifications for how athletes manage the end of their college careers as discussed in the next section.

Termination of Athletic Career

Throughout an athlete's career many transitions occur including the transition at the end of an athletic career. This transition can be very challenging and upsetting to many athletes, especially if an alternative to athletics has not been adequately explored and developed (Gordon & Lavalley, 2011; Wylleman & Lavalley, 2004). In the U.S. athletic development is largely associated with the educational system. Thus, at the end of secondary education and again at the end of higher education (i.e., college) many student athletes are faced with the challenge of finding a vocational path other than professional athletics. As many college student athletes have spent the majority of their time in college developing their athletic identities and careers and do not always spend time refining academic and job skills, it is possible that they are at a disadvantage compared to non-athletes when graduation from college occurs and their athletic career is terminated. Furthermore, college student athletes may undergo a salient negative psychological experience at this time as a critical part of their identity (e.g., being an athlete) is discontinued and they are forced to re-develop a new fulfilling identity without athletics (Wylleman & Lavalley, 2004).

Murphy and colleagues (1996) examined NCAA DI student athletes' ($N = 124$; 99 = male) identity foreclosure, athletic identity, and career maturity. Identity foreclosure occurs when an individual commits to a role or career without exploring other options. Career maturity is defined by having the ability to make responsible, decisive, and independent career decisions. Correlation analyses showed that athletic identity ($r = -.31$) and identity foreclosure ($r = -.36$) were negatively related to career maturity. Female athletes had greater career maturity than male athletes; however, female and male athletes did not significantly differ on identity foreclosure or athletic identity. Student athletes in revenue sports (football, basketball, and hockey) had significantly greater identity foreclosure and significantly lower career maturity compared to

non-revenue sport athletes; but, athletic identity did not significantly differ between revenue and non-revenue sport athletes (Murphy, Petitpas, & Brewer, 1996). Stated differently, many college student athletes, especially those participating in revenue sports, may not be adequately prepared for the termination of their athletic career as college comes to end as their identities are largely based on their athletic abilities and they have not explored other options outside of athletics.

Brown and colleagues (2000) assessed DI college student athletes' (N = 189; male = 117) time spent participating in sport, identity foreclosure, athletic identity, career locus of control, and self-efficacy for career decision making. Fifty-six percent of the athletes reported participating 30 hours or more per week in their sport and 19% of the athletes reported expectations to participate in their sport at a professional level after college. Correlation analyses revealed that self-efficacy for career decision making was negatively related to hours of weekly sport participation ($r = -.317$), identity foreclosure ($r = -.177$), and career locus of control ($r = -.209$). Athletic identity and self-efficacy for career decision making were not significantly related. Stated differently, student athletes who participated in their sport more per week, were more identity foreclosed, and had an external career locus of control tended to have lower self-efficacy for career decision making (Brown, Glastetter-Fender, & Shelton, 2000). These findings are in line with Murphy and colleagues' (1996) findings and show that many student athletes have not adequately explored alternative roles to athletics and are not prepared to making important career decisions at the termination of their collegiate athletic career.

Furthermore, many college student athletes face the challenge of continuing PA behaviors post collegiate athletic careers (Witkowski & Spangenburg, 2008). Sorenson and colleagues (2015) found that former NCAA Division I college athletes compared to non-athletes had lower exercise volume and less compliance with ACSM exercise recommendations. This

was representative of a significant difference in PA participation for former college athletes compared to current college athletes but not former and current non-athletes (Sorenson, Romano, Azen, Schroeder, & Salem, 2015). The continuation of PA behaviors is critical in the maintenance of physical and psychological health across the lifespan.

Reifsteck and colleagues (2013) assessed the relationship between athletic identity and PA among former Division I and Division III college athletes and non-athletes ($N = 105$; 68 = female). Participants also reported stage of exercise change and changes in PA since college. Descriptive statistics revealed that athletic identity was positively correlated with PA for the separate DI athletes, DIII athletes, and non-athletes. Former athletes reported higher athlete identity than non-athletes. A combined correlation analysis with all 3 groups revealed the same pattern with PA and athletic identity having a positive relationship. Further, when non-athletes were removed from the analysis the relationship was stronger. Males reported greater PA than females regardless of previous athlete status.

Regarding exercise stages of change, more former athletes than non-athletes reported being in the maintenance stage. However, similar amounts of former athletes and non-athletes reported being in the inactive stage. Regarding changes in PA since college, former athletes reported a decrease while non-athletes were more likely to report their PA behaviors stayed the same or increased (Reifsteck, Gill, & Brooks, 2013). Reifsteck and colleagues (2013) showed that PA significantly decreased for the majority (78.4%) of former college athletes in the sample regardless of greater athletic identity compared to non-athletes. A reason for this decrease may be due to a self-determined motivational issue and thus requires further study.

Reifsteck and colleagues (2015) assessed 282 former DI college student athletes' exercise identity, athletic identity, self-determined motivation for exercise, and PA. Results from the first

predictive model showed that exercise identity and athletic identity and the interaction between exercise identity and athletic identity were positively correlated and predictive of PA. A second predictive model showed that both identities predicted PA and exercise identity predicted each motivation subscale while only the identified and introjected subscales were related to PA (Reifsteck, Gill, & Labban, 2015). Both identified (value exercise) and introjected (part of self) motivations represent an internalization of exercise behavior which were impacted by exercise identity and then impacted PA.

In conclusion, the transition at the end of college and an athletic career can be a challenge for many college student athletes. Murphy and colleagues (1996) and Brown and colleagues' (2000) research shows that many student athletes have not explored alternatives to athletics while in college and are not prepared to make future career decisions. Also, many athletes do not maintain adequate PA participation after college sport participation which can be detrimental for health outcomes. At the end of college the general expectation of U.S. society is for a young adult to seek out a successful career. Unfortunately, it seems that many college student athletes are not ready to take this step after college graduation due to their immense commitment to athletics during their college years. It is of great import for researchers to examine how to best aid college student athletes in their transition at the termination of their athletic careers.

College Student Athlete Benefits

The literature regarding challenges and ill-being of college student athletes is abundant. In contrast, the literature on benefits and well-being associated with college athletic participation is sparse. In the current section I first discuss the benefit of financial support from athletic scholarships. Next, I discuss the benefit of psychosocial well-being associated with athletic participation including feelings of college adjustment, empowerment, and self-esteem of college

student athletes. Third, the benefit of becoming prepared for life challenges and future career endeavors through sport participation is discussed.

Financial Support

NCAA institutions provide 150,000 college student athletes with \$2.7 billion of athletic scholarships annually (NCAA, 2016c). This is a substantial benefit to many college athletes as without athletic scholarship they may not have the opportunity to further their academic or athletic careers. While many college students accrue substantial debt in order to obtain their degree, access to athletic scholarships can greatly aid in obtainment of a degree without debt. Singer (2008) qualitatively explored the benefits and detriments of 4 African American male football college student athletes' experiences at a NCAA DIA university. The 4 student athletes reported that their participation in college football and their receipt of an athletic scholarship allowed them access to opportunities they would not have had otherwise because their parents did not have the financial means otherwise to send them to college. College student athletes who come from a minority, low SES situation can greatly benefit from the receipt of an athletic scholarship (Singer, 2008).

Psychosocial Well-being

The benefit of psychosocial well-being has been associated with athletic participation and has been assessed using a multitude of variables including feelings of college adjustment, empowerment, and self-esteem of college student athletes. Melendez (2006) assessed college adjustment of freshmen and sophomore student athletes ($N = 101$) and non-athletes ($N = 106$) at 4 Midwest universities. Athlete and non-athlete groups were not significantly different regarding high school GPA, age, and parental education status. Results showed that student athletes had higher academic adjustment and institution attachment than non-athletes. This may be due to the

increase of athlete academic services offered at many institutions in order to aid in academic success of college student athletes. For example, University of Michigan, a DI institution, built a 12 million dollar academic center for their student athlete's academic success program where instructional support staff are employed (MGoBlue, 2016). Also, student athletes are representing their school when competing in their sport, thus pride in their school or school attachment may be greater than non-athletes. This finding also indicates that, in this study, student athletes had greater commitment to academic goals than non-athletes. Results also showed that female student athletes had higher academic and social adjustment and higher institution attachment than male student athletes. This may be due to males having greater opportunities in sport beyond college than females, thus females place more emphasis on academic outcomes (Melendez, 2006).

Blinde and colleagues (1993) explored the effect of sport participation on empowerment of female ($N = 24$; 22 = scholarship athletes) NCAA DI college athletes through interviews. Empowerment is defined as individual taking control and becoming active participants in the betterment of their life situations. Interviews revealed the female college athletes felt empowered through their sport participation in the areas of bodily competence, competence self-perceptions, and having a proactive approach to life. The sport domain is historically influenced and led by males. Thus, the findings that female college athletes are able to experience feelings of empowerment through their sport participation is an important benefit to be aware of and further examine (Blinde et al., 1993)

Prakasa (1986) compared psychological well-being and body image of Black female college athletes ($N = 79$) and Black female non-athletes ($N = 117$). Results revealed that college student athletes had a more positive body image and greater psychological well-being than non-

athletes. Further, body image was strongly related to psychological well-being (Prakasa, 1986). Wilson and Pritchard (2005) had similar findings in a study regarding body image in a study comparing 362 college athletes and non-athletes at a DI university. Results revealed that non-athletes were more dissatisfied with their physical appearance than athletes (Wilson and Pritchard, 2005). Stated differently, college student athletes have the benefit of greater body satisfaction compared to non-athletes, which is related to psychological well-being. These differences may be due to college athletes' participation in regular exercise and awareness of healthy nutrition.

Weight and colleagues (2014) compared psychological outcomes of NCAA DI college athletes ($N = 914$) and non-athletes ($N = 435$). The psychosocial variables achievement striving, self-discipline, toughness, leadership, self-esteem, teamwork, perseverance, courage, and socioemotional intelligence were examined. Researchers also examined demographic variables of gender, class standing, race, age, GPA, revenue/non-revenue sport status, and participation in youth sport. Student athletes had higher achievement striving, teamwork, leadership, courage, and perseverance compared to non-athletes. Females had higher toughness and self-discipline and lower self-esteem compared to males. African-Americans had higher achievement striving and Asians had higher perseverance compared to all other ethnicities. A comparison between class standing did not reveal significant differences (Weight, Navarro, Huffman, & Smith-Ryan, 2014). These findings suggest that college athletic participation may foster various positive psychosocial benefits including teamwork and leadership skills.

Shearman and colleagues (2011) compared life stress and the personality traits of optimism of NCAA DI college student athletes ($N = 177$) and non-athletes ($N = 155$). Optimism is defined as having a positive outlook on life and viewing stressors as opportunities. Optimism

is believed to be a buffer and adaptive coping mechanism to life stressors. Participants were separated into high-optimistic (top 33%) and low-optimistic (bottom 33%) groups. Results showed that high-optimistic athletes had less life stress than low-optimistic athletes, high-optimistic athletes had less life stress than high-optimistic non-athletes, and high-optimistic males had less life stress than high-optimistic females. These findings suggest that participation in athletics may reduce perceptions of life stress through the personality trait of optimism (Shearman et al., 2011).

In conclusion, many researchers (Blinde et al., 1993; Melendez, 2006; Prakasa 1986; Shearman et al., 2011; Weight et al., 2014; Wilson and Pritchard, 2005) have found participation in college athletics to be beneficial to college student athletes through the examination of a multitude of psychosocial variables which represent well-being. These psychosocial benefits and student athlete well-being must be considered in the further examination of college sport participation. Athletic participation can also aid in preparing for a career after college as discussed next.

Career Preparation

The college athletic experience can involve the introduction to many people, businesses, and organizations. These introductions can create the opportunity for social networking and possible future career connections for college student athletes (Watt & Moore, 2001). Chalfin and colleagues (2014) surveyed 50 prospective employers and found that many companies desire specific qualities and skills that college student athletes possess due to their participation in college athletics. These qualities and skills are being competitive, goal-oriented, able to handle pressure, having a strong work ethic, confidence, being coachable, working well with others, and being self-motivated (Chalfin et al, 2014). These findings suggest that college athletic

participation is of great value to college athletes, especially in their process of finding employment after college graduation.

Former athletes ($N = 229$) of non-revenue sports from DI (53.3%) and DIII institutions completed mixed-method surveys regarding their past athletic and academic experiences. Paule-Kobe and Farr (2013) found that DI and DII athletes reported they felt prepared for life beyond athletic competition and satisfied with the way their college experience had shaped their current life situations. Former athletes reported that their overall college experience, athletic and academic, had prepared them for life. For example, one athlete stated that participation in athletics taught them excellent communication skills. Another athlete stated that athletic participation taught them how to set goals and be disciplined in achieving those goals (Paule-Kobe & Farr, 2013). Singer (2008) also found that African-American college student athletes felt their athletic participation prepared them for life's challenges. Overall, college student athletes reported a positive college experience which they felt prepared them for a career and life after athletics.

Summary

The literature that has been presented revealed the unique challenges and benefits college student athletes experience beyond those experienced by college non-athletes make college student athletes. This makes college student athletes a unique subset of the young adult population, thus warranting much study and examination. This literature review showed that much work is still necessary concerning college student athletes in order to promote understanding and aid in the positive outcomes of this unique population. Further, this review revealed that the challenges and benefits associated with participating in collegiate athletics are interconnected and it is critical to create a holistic view of college student athletes through future

research endeavors. Theory offers researchers a systemic approach to understand psychosocial outcomes and behaviors of college student athletes. Thus, quality research is guided by a strong theory base. The current study is guided by Self-Determination theory. The current state of the research regarding self-determination theory and college student athletes is discussed next.

Self-Determination Theory and College Student Athletes

Self-determination theory (SDT) describes the various forms of motivation an individual can possess along a continuum from amotivation to extrinsic motivation to intrinsic motivation. Intrinsic motivation is thought to be optimal as it is indicative of self-determined behavior and the satisfaction of the 3 basic needs and thus, continued participation in that behavior or activity. In recent research, many researchers have examined college student athlete levels of intrinsic and extrinsic motivation for sport participation (Amorose & Horn, 2001; Medic, Mack, Wilson, & Starkes, 2004) within the framework of SDT. Researchers have also explored motivational climates and basic need satisfaction within SDT (Amorose & Anderson-Butcher, 2007; Hollembeak & Amorose, 2005).

Amorose and Horn (2001) assessed freshmen DI college student athletes' ($N = 72$) pre- to post-season changes in intrinsic motivation. Athletes also reported scholarship status and perceptions of coaching behaviors. Results showed nonsignificant changes from pre- to post-season of intrinsic motivation. Scholarship status was also not predictive of intrinsic motivation. However, perceptions of coaching behaviors were related to athletes' intrinsic motivation. Athletes who perceived their coaches to have a lot of instructional behavior and decreased autocratic behavior reported higher levels of intrinsic behavior. Within the sub-theory CET of SDT, these findings are explained as social context was an important contributor to feelings of intrinsic motivation (Amorose & Horn, 2001). The explanation of intrinsic motivation within

college student athletes is important as intrinsic motivation is indicative of higher self-determined behaviors and greater well-being.

Medic and colleagues (2004), similar to Amorose and Horn (2001), examined the effect of athletic scholarship on motivations of DI college basketball athletes ($N = 116$; scholarship = 46). The sport motivation scale (SMS) was completed by athletes regarding their present scholarship status and a second time regarding a change in their scholarship status (i.e., scholarship to non-scholarship and vice versa). Results showed that male scholarship athletes had higher levels of introjected regulation compared to female scholarship athletes and male scholarship athletes also had higher levels of external regulation compared to female scholarship athletes and non-scholarship male and female athletes (Medic et al., 2004).

Additionally, current non-scholarship athletes who thought of a future scholarship status had a decrease in intrinsic motivation to experience stimulation and accomplish things and an increase in external regulation. Recall that an example of external regulation is an athlete who shows up to practice in order to avoid punishment or receive rewards from external sources. Intrinsic motivation to experience stimulation and to accomplish things also decreased for present scholarship athletes who thought a future non-scholarship status (Medic et al., 2004). The results differ from those of Amorose and Horn's (2001) study in that Medic and colleagues (2004) found possible negative effect of scholarship status while Amorose and Horn (2001) did not.

Coaches, Teammates and Psychosocial Outcomes College Student Athletes

Within the framework of SDT, researchers have also examined the effects of controlling and autonomy supportive coaching behaviors. In a controlling environment a coach may demand that an athlete devote all of their time to their sport, check up on an athlete outside of practice, or punish an athlete for questioning a workout. In an autonomy supportive environment

a coach may make an athlete feel like they have control over their workout choice, ask an athlete their opinion about a workout, or explain why a workout is being completed. DeFreese and Smith (2013) examined perceived teammate support, received teammate support, support satisfaction, and well-being of college student athletes ($N = 235$). Well-being was defined as lack of athlete burnout and presence of self-determined motivation. Self-determined motivation was measured using the sport motivation scale (SMS). Results showed that perceived support, beyond support satisfaction, was predictive of athlete burnout and self-determined motivation. It was not the act of getting support but simply knowing they have support available that was a predictor of self-determined motivation. An athlete who perceived high levels of support reported less burnout and higher self-determined motivation (DeFreese & Smith, 2013). These findings suggest that perceived support is an important aspect of college athlete teammate interactions and the college sporting environment which may facilitate feelings of self-determined motivation for athletic participation.

Amorose and Anderson-Butcher (2007) examined high school and college athletes' ($N = 581$) perceptions of autonomy-supportive sport climates, basic needs satisfaction and self-determined motivation. A mediation model was proposed in which the relationship between sport climate and motivation was mediated by basic need satisfaction. The hypothesized mediational model was confirmed suggesting that an autonomy supportive environment was predictive of satisfaction of the basic needs of competence, autonomy, and relatedness, which predicted self-determined motivation. Athletes who perceived that the sport environment was supportive of their autonomy experienced enhanced satisfaction of their basic needs. In turn, their increased satisfaction with meeting their basic needs led to an increase in self-determined motivation. An autonomy supportive environment was most related to the satisfaction of the

basic need of autonomy. These findings were consistent across gender and age (Amorose & Anderson-Butcher, 2007).

In a similar study, Hollembeak and Amorose (2005) assessed a mediational model of perceived coaching behaviors relationship with intrinsic motivation through perceptions of the 3 basic needs of NCAA DI college student athlete ($N = 280$). Coaching behaviors were measured through athlete perceptions of training and instruction, positive feedback, autocratic behavior, democratic behavior, and social support demonstrated by coaches. Structural equation model results showed coaching behaviors predicted the 3 basic needs, which explained 22% of the variance in the prediction of intrinsic motivation. Thus, the mediation model was confirmed (Hollembeak & Amorose, 2005).

Summary. Researchers (DeFreese & Smith, 2013; Amorose & Anderson-Butcher, 2007; Hollembeak & Amorose, 2005) have shown the importance of coach and teammate relationships for college student athletes. College student athlete perceptions of autonomy supportive behavior of coaches, greater social support, and less negative teammate interactions are predictive of positive psychosocial outcomes including satisfaction of basic needs and intrinsic motivation for sport participation. Furthermore, such perceptions also are predictive of less athlete burnout. Less athlete burnout of college student athletes due to positive coach and teammate social influences may be related to greater athlete engagement of college student athletes. Athletic engagement is the conceptual opposite of athlete burnout and the study of both concepts simultaneously in the college student athlete population is warranted.

Thus, the current study aimed to examine athlete burnout and athlete engagement as outcomes of college student athlete perceptions of coaching behaviors and teammate interactions. College student athletes who experience minimal burnout and who are engaged in

their sport and academics should have a positive college experience. Current research regarding college student academic engagement and burnout is discussed next.

College Student Athletes and Academic Engagement and Burnout

In addition to important psychosocial athletic outcomes of college student athletes, psychosocial academic outcomes such as academic engagement and burnout was assessed in the current study in order to explore sources of influence of such variables. Academic engagement is defined as having a positive and fulfilling state of mind towards academic endeavors that is characterized by vigor, dedication, and absorption in a field of study (Schaufeli, Salanova, Gonzalez-Roma, & Bakker, 2001). A student who is high in academic engagement is involved in school activities, excited about their field of study, and fulfilled by their academic experiences. Academic burnout is defined as a student feeling exhausted due to school demands, feeling cynical and detached toward school, and feeling incompetent in school endeavors (Schaufeli, Martinez, Pinto, Salanova, & Bakker, 2002). A student who is high in academic burnout is not involved in school activities, is cynical about their field of study and what their future may be following their field of study, and does not feel competent while completing academic endeavors. Academic engagement and academic burnout are conceptual opposites. Academic burnout has been considered the lack of academic engagement, thus these constructs are negatively related (Schaufeli et al., 2002).

Purposeful engagement in academic activities by college student athletes has been shown to be a positive influence on academic self-concept of college student athletes (Comeaux, Speer, Taustine, & Harrison, 2011). High academic self-concepts may be indicative of greater academic performance which is important for college student athletes in order to have well rounded

university experiences. It is important to examine predictors of such academic outcomes of student athletes which are discussed next.

Academic engagement and academic burnout of college student athletes may be affected by perceptions of coach and teammate relationships. Paskus (2012) stated that feeling connected to a coach was a factor that could contribute to lowered academic risk of college athletes (Paskus, 2012). Academic risk is represented by a student who may have a low GPA and is at risk of dropping out of school. Comeaux and Harrison (2011) also stated that college coach investment in their athletes academic outcomes are extremely influential in student athlete academic success due to the frequency of interactions between coaches and athletes. A coach who has a “win at all costs” attitude may either negatively impact academic outcomes of their athletes if they expect an athlete to decrease time devoted to academics in order to dedicate more time to sport. However, this attitude may have a positive impact on academic outcomes of their athletes if they expect an athlete to maintain competition eligibility by attending classes and maintaining a certain GPA. The effect of perceptions of coaching behaviors on academic engagement and burnout of college student athletes is uncertain, therefore the study of such impacts is warranted.

Carter-Francique and colleagues (2013) qualitatively examined Black college athlete’s regarding the role of social support in academic success through interviews. Academic success was defined by the subjects in various ways including remembering what was learned in classes and being able to apply what was learned to life. These definitions of academic success are similar to feeling fulfilled by academic endeavors which is a part of the construct academic engagement. Some subjects stated that their teammates would tutor them if they were having trouble in a class. It was also stated that teammates provided unconditional support in order for

them to be successful in the academic domain (Carter-Francique, Hart, & Steward, 2013). Stated differently, athletes felt their relationships with teammates were critical influences in academic outcomes.

The coach-athlete and teammate-athlete relationships are salient in a college student athlete's life as an athlete spends at least 20 hours a week immersed in these relationships. It is logical that perceptions of these relationships would affect various domains of an athlete's life including the academic domain. A pathway to academic engagement and academic burnout may be through academic social support from coach and teammate sources. Academic social support is discussed next.

Academic social support. Social support has been defined by Schumaker and Brownell (1984) as, "An exchange of resources between at least two individuals perceived by the provider or the recipient to be intended to enhance the well-being of the recipient" (Gill & Williams, 2008). Social support from informal sources such as peers compared to formal sources such as academic support counselors have been identified to be of greater importance in the academic domain. Academic social support received from peers can facilitate friendships which allow positive development during college years (Thompson & Mazer, 2009).

Academic social support is higher quality and more effective when received from a friend because students have greater concern for a friend than from an unknown academic support counselor. Academic social support can be informational, esteem, motivational, or venting support. Informational support is when a student helps another student with an academic problem. Esteem support is when a student increases another student's self-esteem. Motivational support is when a student motivates another student to complete an academic endeavor such as

studying for an exam or finishing a paper. Lastly, venting support is when a student listens to another student vent about a certain professor or class (Mazer & Thompson, 2011).

Coach and teammate relationships can be conceptualized as close friendships for many student athletes. Although both relationships represent close friendships the academic social support from these sources may be very different. A teammate may offer greater motivational support for academics than a coach in that teammates may be able to study together while travelling to a competition. If a teammate is absent from the travel to the competition this may adversely affect the academic support felt by an athlete. A coach's academic support for an athlete may be in the form of accepting that an athlete miss practice in order to take a class that is only offered during practice time or understanding if an athlete misses a practice in order to study for an upcoming exam. A coach who does not permit such allowances may decrease the amount of academic social support perceived by an athlete and hinder student athlete academic outcomes. It is logical that academic social support from these sources would be significant predictors of academic outcomes. Research regarding the effects of academic social support from teammates and coaches on college student athletes is lacking. In the current study I explored the relationship between academic social support from teammates and coaches and academic outcomes as an extension to the pilot study which is discussed next.

Pilot Study

A pilot study was conducted on a sample of 78 Division I male and female college student athletes participating in the sports of cross country, swimming and diving, basketball, and soccer with a mean age of 19.7 years old. The psychosocial predictors of athlete burnout including perceptions of controlling coach behaviors, autonomy supportive coaching behaviors, and negative teammate interactions were obtained pre-season. Post-competitive season

questionnaires assessed athlete burnout. The pilot study measures produced adequate reliability ($0.91 < \alpha < .93$). Bivariate correlation analyses revealed moderate to large positive relationships between perceptions of controlling coaching behaviors and negative teammate interactions ($r = 0.46$), controlling coaching behaviors and athlete burnout ($r = 0.38$), and negative teammate interactions and athlete burnout ($r = 0.24$). Bivariate correlation analyses also revealed moderate to large negative relationships between perceptions of controlling coaching behaviors and autonomy supportive coaching behaviors ($r = -0.40$), autonomy supportive coaching behaviors and athlete burnout ($r = -0.37$), and negative teammate interactions and autonomy supportive coaching behaviors ($r = -0.21$). These findings suggest that college student athletes' perceptions of controlling coaching behavior and negative teammate interactions are positively related to athlete burnout and perceptions of autonomy supportive coaching behavior is negatively related to athlete burnout.

The pilot study suggested that salient social influences of college student athletes such as coaches and teammates are related to athletic outcomes such as athlete burnout. The present study further investigated the predictability of positive and negative salient social influences of college student athletes such as coaches and teammates of positive and negative athletic and academic outcomes. The current study extended the pilot study by examining perceptions of positive as well as negative teammate interactions and academic social support of coaches and teammates in addition to controlling and autonomy supportive coaching behaviors and negative teammate interactions as predictors of athlete burnout. Additionally, the current study extended the pilot study by examining a positive athlete outcome of athlete engagement as well as exploring the relationship between the predictor variables and academic outcomes of student engagement and student burnout.

Summary

In summary, relationships between coaching climates and athlete outcomes have been well established. Controlling coaching behaviors are positively related to the negative outcome of athlete burnout and negatively related to the positive outcome of athlete engagement. Autonomy supportive coaching behaviors are positively related to the positive outcome of athlete engagement and negatively related to the negative outcome of athlete burnout.

The relationship between teammate interactions and athlete outcomes are less well established. However, in the pilot study negative teammate interactions were positively related to athlete burnout. Also, teammate support, which is considered a positive teammate interaction, has been found to be negatively related to athlete burnout (DeFreese & Smith, 2013). The conceptual opposite of athlete burnout, athlete engagement, has been less well studied. However, less athlete burnout of college student athletes may be related to greater athlete engagement. Thus, a positive relationship between athlete engagement and positive teammate interactions and a negative relationship between athlete engagement and negative teammate interactions is hypothesized.

The relationships between coaches and athletes academic outcomes has also been established with positive academic outcomes such as lowered academic risk being related to positive coaching relationships. A positive coaching relationship may be defined as autonomy supportive behaviors and lack of controlling behaviors exhibited by the coach. Positive teammate interactions such as social support have also been related to positive academic outcomes such as feelings of academic success. Lowered academic risk and feelings of academic success may contribute to academic engagement of college student athletes. Academic burnout, the conceptual opposite of academic engagement, may be positively related to controlling coaching

behaviors and negative teammate interactions and negatively related to autonomy supportive coaching behaviors, positive teammate interactions, and academic social support. The established validity of these variable relationships guided the conceptualization of the current study.

CHAPTER 3 METHODOLOGY

Research Questions

Athlete

Research Question 1: Do college student athlete perceptions of controlling and autonomy supportive coaching behavior, positive and negative teammate interactions predict athlete burnout and engagement?

Research Hypothesis 1: It is hypothesized that college student athlete perceptions of low controlling coaching behaviors and low negative teammate interactions and high autonomy supportive coaching behaviors and high positive teammate interactions will be predictive of high athlete engagement and low athlete burnout.

Research Hypothesis 2: It is hypothesized that college student athlete perceptions of high controlling coaching behaviors and high negative teammate interactions and low autonomy supportive coaching behaviors and high positive teammate interactions will be predictive of low athlete engagement and high athlete burnout.

Academic

Research Question 2: Do college student athlete perceptions of controlling and autonomy supportive coaching behavior, positive and negative teammate interactions, and teammate and coach academic social support predict student burnout and engagement?

Research Hypothesis 3: It is hypothesized that college student athlete perceptions of low controlling coaching behaviors and low negative teammate interactions and high autonomy supportive coaching behaviors, high positive teammate interactions, and high coach and teammate academic social support will be predictive of high student engagement and low student burnout.

Research Hypothesis 4: It is hypothesized that college student athlete perceptions of high controlling coaching behaviors and high negative teammate interactions and low autonomy supportive coaching behaviors, low positive teammate interactions, and low coach and teammate academic social support will be predictive of low student engagement and high student burnout.

Participants

A sample of college student athletes who are at least 18 years old (50% female; 80% Caucasian) from a university in the Midwest was recruited to participate. Student athletes from various varsity sport teams including women's and men's basketball ($N = 15$, $N = 9$), women's and men's soccer ($N = 24$, $N = 25$), women's and men's cross country ($N = 23$, $N = 12$), women's and men's swimming and diving ($N = 23$, $N = 25$), women's tennis ($N = 8$), women's and men's golf ($N = 10$, $N = 7$), volleyball ($N = 16$), baseball ($N = 22$), and softball ($N = 20$) were recruited through contact with their respective coaches. The total potential sample size was 230.

Sample Size

Green (1991) suggests examining an $N > 104 + m$ where m represents the number of independent variables examined when analyzing individual predictors in a regression analysis. Thus, the current sample size was at least 109 college student athletes because 5 independent variables will be examined. Additionally, according to a power analysis in order to attain an effect size of 0.1 (Cohen's d), with power of .80, and alpha of .05, 125 participants are required. Based on the pilot study I expect to easily attain 125 or more college student athlete participants out of the total 230 available.

Procedure

Permission from the collaborating University (Oakland University, Auburn Hills) internal review board (IRB), Wayne State University IRB, the collaborating university athletic director and coaches was received. Data was collected at the collaborating university in a lab setting. The

current study was a part of a larger ongoing study occurring at the collaborating institution. The author and her advisor have worked with the lab director at Oakland University in the past to complete the pilot study and other studies successfully (e.g., Hew et al., 2014; Byrd, Hew, & Martin, 2015). Participant informed consent was received prior to data collection. Data collection occurred at 1 time point during the academic school year. Fall sport athletes (cross country, golf, soccer, swimming and diving, tennis and volleyball; $N = 173$) and Winter sport athletes (baseball, softball, basketball; $N = 66$) completed surveys consisting of 121 items during the this time point. There were 4 forms of the survey with teammate, coach, academic, and athlete scales in blocks. Surveys were completed by participants with instructions: Please complete this questionnaire thinking about the previous calendar year at Oakland University. Surveys took about 30 minutes to complete during 1 lab visit. Because data collection can be concluded in one 30 minute lab visit subject burden was low. The principle investigator (PI) was present to answer any participant questions. Prior to athletes leaving the lab surveys were checked by the PI in order to minimize missing data.

Demographic Information

The demographic information provided by athletes included their age, gender, and ethnicity, total years in life participating in their sport competitively, scholarship status, years left of eligibility, and competition status.

Variables

Independent Variables included controlling coaching behavior, autonomy supportive coaching behavior, student academic social support from teammates and coaches, and positive and negative teammate interactions.

Dependent Variables included athlete burnout, athlete engagement, student burnout, and student engagement.

Instruments

Controlling Coaching Behavior

Controlling coaching behavior was assessed using the Controlling Coaching Behavior Scale (CCBS; Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2010) which consists of 15 items and 4 subscales: controlling use of rewards, negative conditional regard, intimidation, and excessive personal control. Participants will respond to items on a 7 point Likert scale with 1 representing *strongly disagree* and 7 representing *strongly agree*. Respective sample items of subscales include, “My coach tries to motivate me by promising to reward me if I do well.”; “My coach is less accepting of me if I have disappointed him/her.”; “My coach intimidates me into doing the thing that he/she wants me to do.”; and “My coach tries to control what I do during my free time.” Subscale items will be summed and divided by respective number of subscale items to attain scores. Bartholomew et al. (2010) established adequate validity and reliability ($\alpha = 0.74 - 0.84$).

Autonomy Supportive Coaching Behavior

Autonomy supportive coaching behavior was assessed using the Sport Climate Questionnaire- short form (SCQ-S) which consists of 6 items. The original SCQ is 15 items and is based on the Health Care Climate Questionnaire (HCCQ; Williams & Deci, 1996). Participants will respond to items on a 7 point Likert scale with 1 representing *strongly disagree* and 7 representing *strongly agree*. A sample item is, “My coach listens to how I would like to do things.” Items will be summed and divided by 6 to attain an autonomy supportive coaching behavior score. The original SCQ is 15 items and is based on the Health Care Climate Questionnaire (HCCQ) which Williams and colleagues (1996) have established adequate reliability ($\alpha = 0.92$; Williams, Grow, Freedman, Ryan, & Deci, 1996) and Williams and colleagues (1998) have established adequate validity and reliability of the HCCQ - short version

($\alpha = 0.80$) (Williams, Freedman, & Deci, 1998). Amorose and Anderson-Butcher (2007) established adequate validity and reliability of the SCQ-S among high school and college student athletes.

Student Academic Social Support

Student athlete academic social support from teammates and coaches was measured using 2 subscales of the student academic social support (SASS) scale (Thompson & Mazer, 2009). The esteem support and motivational support subscales are comprised of 3 items each which answer the question, “In the past week, how often did your coaches/teammates...” on a 5 point Likert scale with 1 representing *not at all* and 5 representing *about every day*. A sample item from the esteem support subscale is, “...enhanced my self-esteem through academic support.” A sample item from the motivational support subscale is, “...encouraged me to study.” Items will be summed and divided by 6 to attain a composite teammate student academic social support score and coach student academic social support score. Mazer and Thompson (2011) established adequate validity and reliability of the 2 subscales ($0.78 < \alpha < 0.81$) (Mazer & Thompson, 2011).

Positive and Negative Teammate Interactions

Positive and negative teammate interactions was measured using an altered version of the Positive and Negative Social Exchanges scale (PANSE; Newsom et al., 2005) which consists of 2 subscales of 12 items each. Participants will respond to the question, “In the past month, how much were you (satisfied) bothered when your sport teammates...” using a 4 point Likert scale with 1 representing *never (satisfied) bothered* and 4 representing *very (satisfied) bothered*. A sample item from the positive interaction scale is, “...helped you with an important task or something that you could not do on your own.” A sample item from the negative interaction scale is, “...failed to give you assistance you were counting on.” Subscale items will be summed

and divided by 12 to attain positive and negative teammate interaction scores. Adequate validity and reliability ($\alpha = 0.93$) have been established (Newsom et al., 2005).

Athlete Burnout

Athlete burnout was assessed using the Athlete Burnout Questionnaire (ABQ; Raedeke & Smith, 2001) which consists of 15 items and 3 subscales. The 3 subscales and sample items are: emotional/physical exhaustion (“I feel overly tired from my sport participation.”), reduced sense of accomplishment (I am not performing up to my ability in my sport.”), and devaluation (“I have negative feelings toward my sport.”). Participants respond to items on a 5 point Likert scale with 1 representing *almost never* and 5 representing *almost always*. Specific items are reverse scored then subscale items will be summed and divided by respective number of subscale items to attain scores. Raedeke and Smith (2001) found adequate reliability of the ABQ ($\alpha \geq .70$).

Student Burnout

Student burnout was assessed using the Maslach Burnout Inventory – Student Survey (MBI-SS; Schaufeli et al., 2002) which consists of 15 items and 3 subscales. The 3 subscales and sample items are: exhaustion (“I feel emotionally drained by my studies.”), cynicism (“I have become more cynical about the potential usefulness of my studies.”), and efficacy (“I feel stimulated when I achieve my study goals.”). Participants respond to items on 7 point Likert scale with 0 representing *never* and 6 representing *always*. A high score on the exhaustion and cynicism subscales and a low score on the efficacy subscale indicate student burnout. Schaufeli and colleagues (2002) established adequate validity and reliability of the MBI-SS ($0.67 > \alpha > 0.86$).

Athlete Engagement

Athlete engagement was assessed using the Athlete Engagement Questionnaire (AEQ; Lonsdale, Hodge, & Jackson, 2007) which consists of 16 items and 4 subscales. The 4 subscales and sample items are: confidence (“I am confident in my abilities.”), dedication (“I am dedicated to achieving my goals in sport.”), vigor (“I feel energized when participate in my sport.”), and enthusiasm (“I am enthusiastic about my sport.”). Participants respond to items on a 5 point Likert scale with 1 representing *almost never* and 5 representing *almost always*. Subscale items will be summed and divided by 4 to attain scores. Lonsdale and colleagues (2007) found adequate reliability of the AEQ ($0.84 > \alpha > 0.89$).

Student Engagement

Student engagement was assessed using the Student engagement scale (Schaufeli et al., 2002) which consists of 17 items and 3 subscales. The 3 subscales and sample items are: vigor (“I feel strong and vigorous when I’m studying or going to class.”), dedication (“I am proud of my studies.”), and absorption (“I am immersed in my studies.”). Participants respond to items on 7 point Likert scale with 0 representing *never* and 6 representing *always*. Subscale items will be summed and divided by corresponding number of subscale items to attain scores. Schaufeli and colleagues (2002) established adequate validity and reliability of the student engagement scale ($0.73 > \alpha > 0.85$).

Data Analysis

Preliminary analyses

Data was checked for missing values and mean imputation was used for missing data points. Missing data points were assessed to determine if they were missing completely at random (MCAR; the missing data was unrelated to the study variables) and if 3% of data points are missing for 1 subject then deletion occurred. Total scale composite scores were used in order to maintain adequate subject to variable ratio. Data was screened for outliers, normality, and

multicollinearity. Internal consistency scores (Cronbach alpha) were assessed. Means, standard deviations, ranges, skewness, kurtosis, and Pearson product correlations results were analyzed. Criterion for correlation interpretation were as follows: small (.10 – .29), medium (.30 - .49), and large ($\geq .50$) (Cohen, 1988). Prior to running the regression analyses, tolerance and variance inflation factors were examined in order to assess multicollinearity (Cohen, Cohen, West, & Aiken, 2003). Alpha was set at $p < .05$ to determine significance. Demographic information was used to describe the sample.

Main analyses

Four multiple linear hierarchical regression analyses (Figures 1-4) were conducted to examine the ability of controlling and autonomy supportive coaching behaviors, positive and negative teammate interactions, and student academic social support to predict athlete burnout, athlete engagement, student burnout, and student engagement. Effect sizes (f^2) for all 4 multiple regression analyses were determined, reported and interpreted to provide information on how meaningful any significant results are (Cohen & Cohen, 1975).

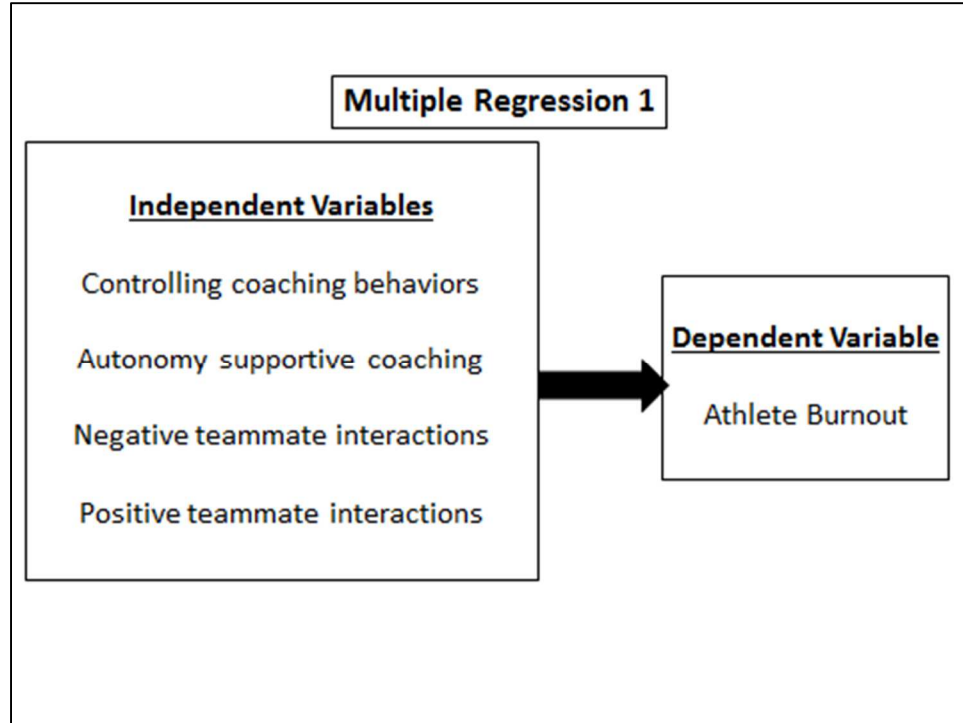


Figure 1

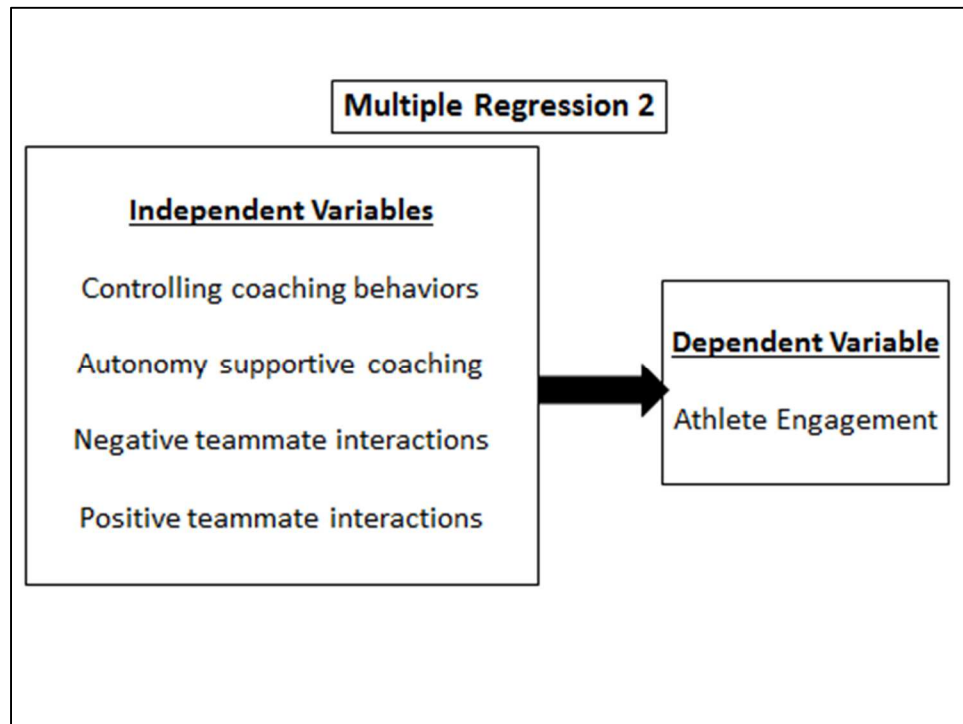


Figure 2

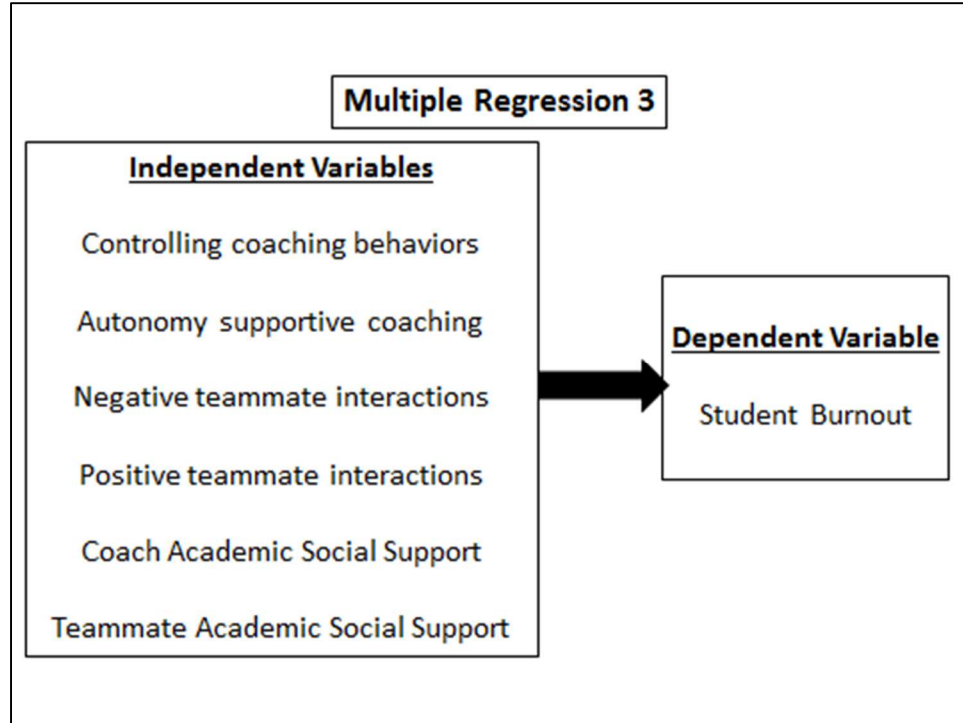


Figure 3

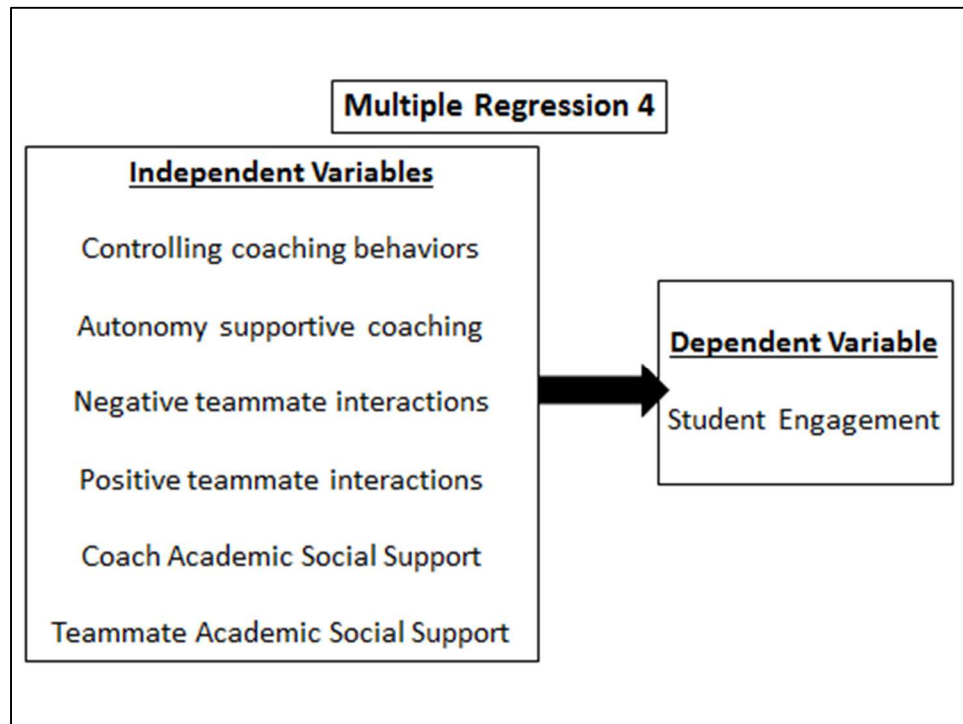


Figure 4

CHAPTER 4 RESULTS

Introduction

As noted in earlier chapters, the study of psychosocial predictors of college student athlete burnout and engagement in both athletics and academics is of a great importance. Hence, the purpose of this study was to examine the ability of controlling and autonomy supportive coaching behaviors, positive and negative teammate interactions, and student academic social support from coaches and teammates to predict athlete burnout, athlete engagement, student burnout, and student engagement. Data analysis and results of each research question and hypothesis is addressed in this chapter. The chapter is organized into five sections: 1) preliminary analyses (i.e., missing data, alpha coefficients), 2) participant characteristics, 3) descriptive results, 4) correlations and, 5) multiple regression results for the four research questions and hypotheses.

Preliminary analysis

Data was checked for missing values. Total missing data was 0.17%. However, two cases were missing greater than 3% of total data thus they were not included in further analyses making the final $N = 179$. Mean imputation was used for remaining missing values. Data were screened for outliers, normality, skewness, and kurtosis. Internal consistencies of composite scale scores produced by the participants were assessed and alpha coefficients ranging from 0.86 – 0.96 were indicative of adequate reliability (see Table 1). Means, standard deviations, ranges, and Pearson product correlations were also examined (see Table 1). Prior to running the regression analyses, tolerance (0.42 - 0.95) and variance inflation factors (1.06 – 2.36) ranges were examined, suggesting there was no evidence of multicollinearity. Tolerance values greater

than 0.10 and variance inflation factors less than 10 are considered acceptable (Cohen, Cohen, West, & Aiken, 2003).

Multiple regression analyses results were interpreted based on variance accounted for and equating variance accounted percentage with small, medium, and large effect sizes. Results were also interpreted for variable importance based on beta weights (standardized β) and structure coefficients (r_s). Beta weights are indicative of the strength of an independent variable to predict the dependent variable while controlling for all the other predictor variables. Structure coefficients are also reported as they are simply the bivariate correlation between a predictor variable and a synthetic variable and thus are indicative of predictor variable's value within a multiple regression analysis, yet are not affected by multicollinearity. A synthetic variable is created by the regression equation which takes into account all other predictor variables in the multiple regression analysis. Interpreting beta weights and structure coefficients together allows for a more accurate representation of the value of predictor variables in explaining variance in the dependent variable (Yeatts, Barton, Henson, & Martin, 2017).

Participant Characteristics

Two-hundred-and-ninety-nine NCAA DI student athletes were recruited to participate from a local university in the midwestern USA to participate in this study between October 2016 and February 2017. A sample of 179 (60% of total student athletes) NCAA DI male (N = 74, 41.3%) and female (N = 105, 58.7%) student athletes participated. As mentioned previously, according to an a-priori power analysis in order to attain an effect size of 0.1 (Cohen's d), with power of .80, and alpha of .05, 125 participants were required. Thus, a sample size of 179 was adequate to have sufficient power to predict small, medium, and large effect sizes. Participants ranged in age from 18 to 24 years of age with a mean age of 19.8 years (SD = 1.37). On average

participants had participated in their sport 11.8 years (SD = 3.8). Athletes participated in the following sports: soccer (N = 43, 24%), swimming and diving (N = 42, 23.5%), basketball (N = 26, 14.5%), cross country (N = 22, 11.7%), golf (N = 15, 8.4%), volleyball (N = 10, 5.6%), track and field (N = 9, 5%), baseball (N = 2, 1.1%), softball (N = 2, 1.1%), and hockey (N = 1, 0.6%). Sixty-one (34.1%) of participants received full athletic scholarships, 83 (46.4%) received partial athletic scholarships, and 35 (19.6%) did not receive athletic scholarships. The majority of athletes competition status' were true freshmen (N = 42, 23.5%), true junior (N = 34, 19%), true sophomore (N = 30, 16.8%), and true senior (N = 30, 16.8%) (See Figure 8 for remainder of sample competition statuses). The racial background of the participants was largely Caucasian (N = 141, 78.8%) and African American (N = 23, 13.4%) (See Figure 6 for remainder of sample races). Characteristics of the participants are summarized in Figures 5 – 10.

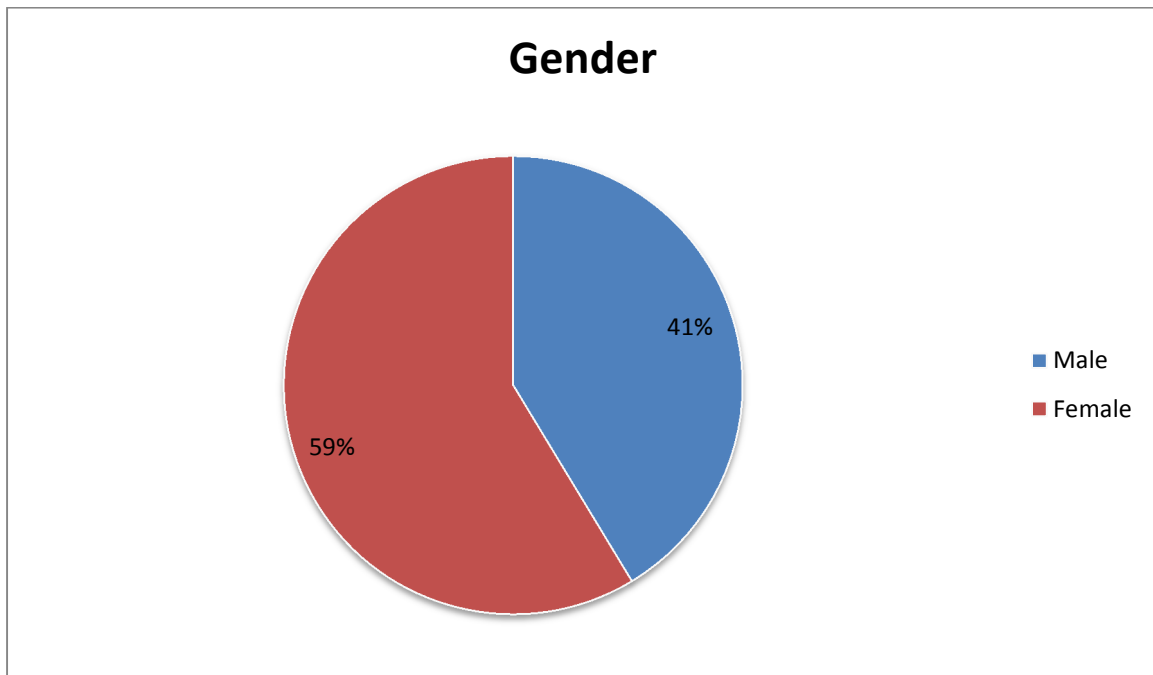


Figure 5

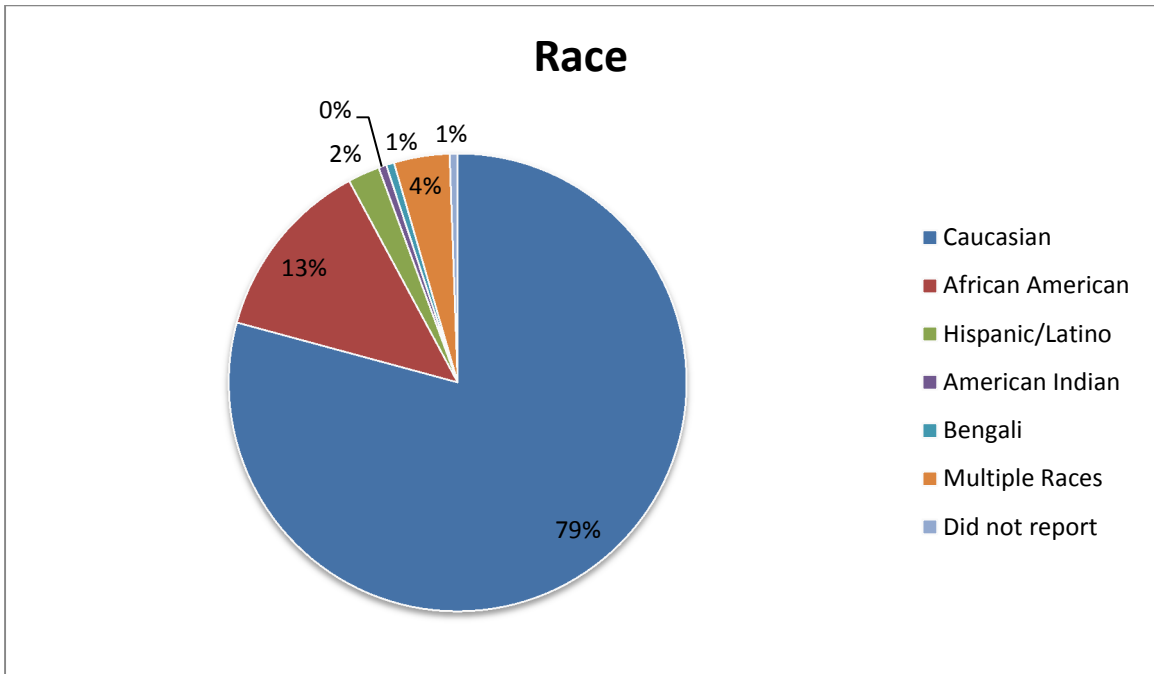


Figure 6

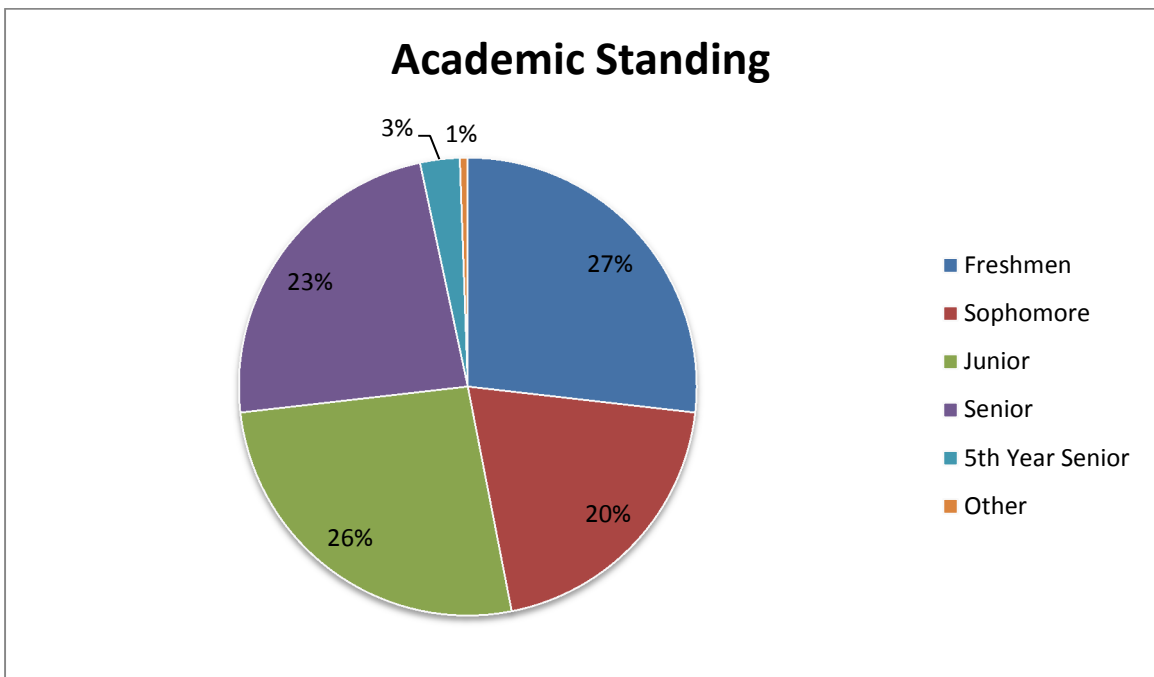


Figure 7

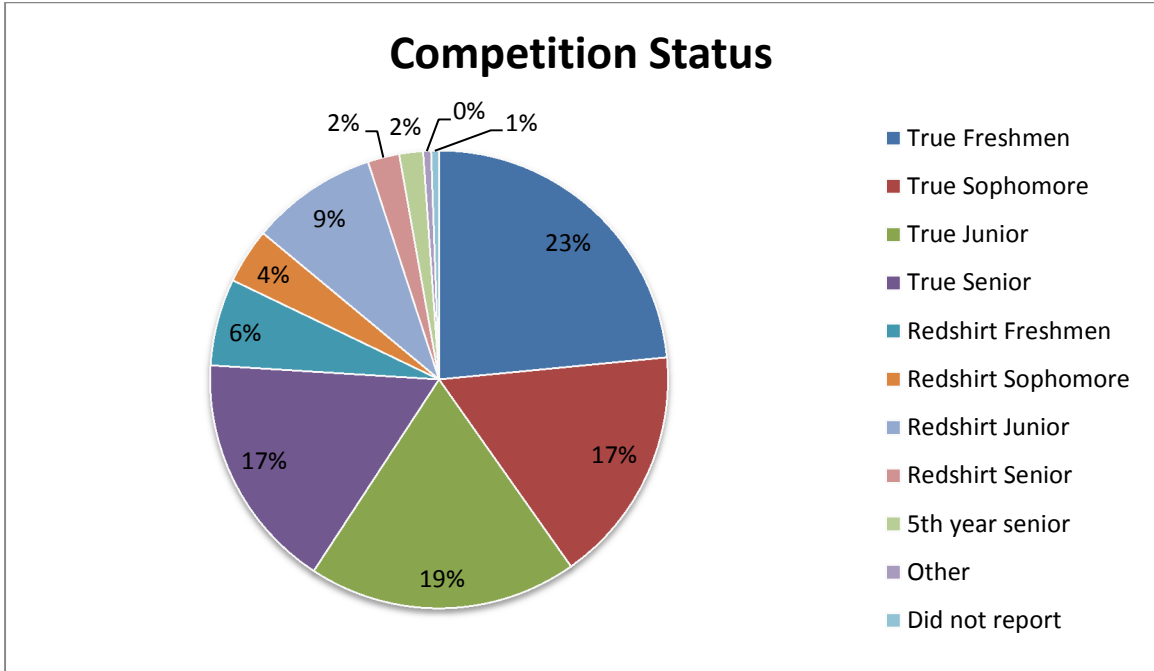


Figure 8

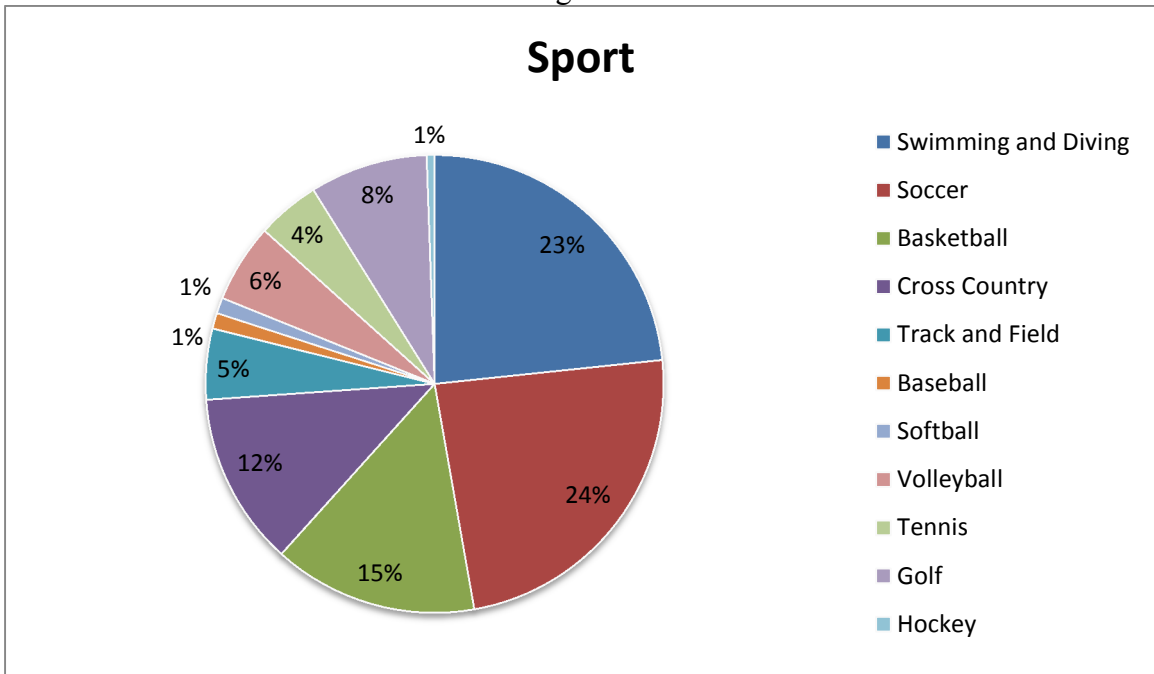


Figure 9

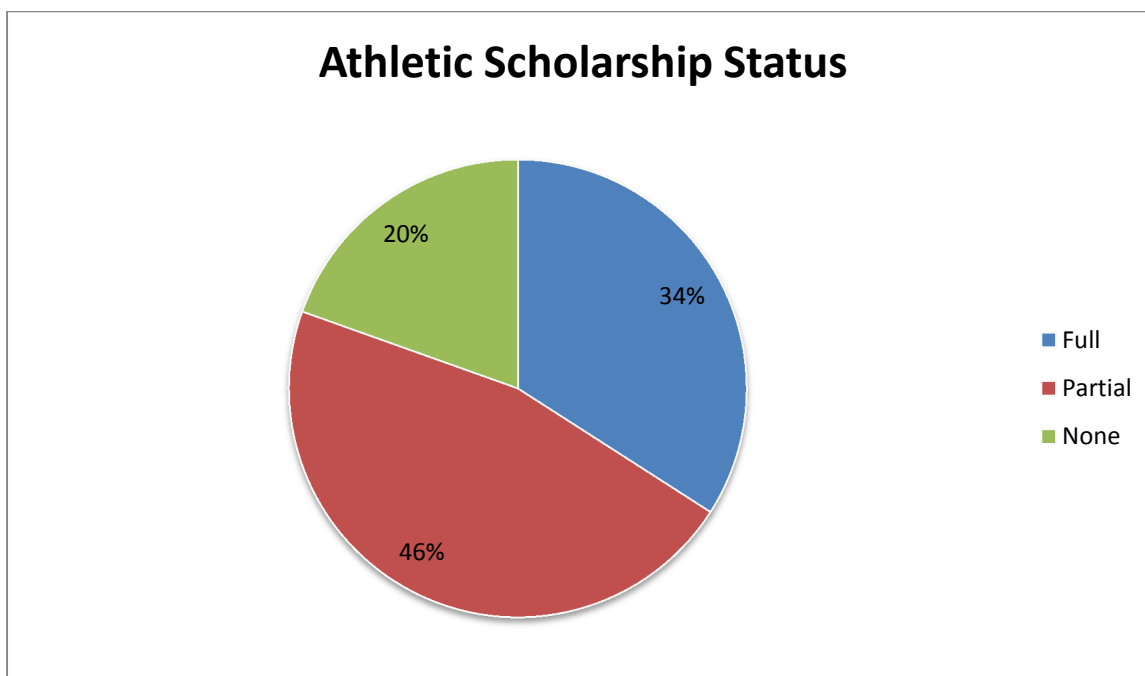


Figure 10

Descriptive Results

Controlling Coaching Behavior

Participants rated perceptions of controlling coaching behaviors on a Likert scale ranging from 1 – 7 with a higher score representing perceptions of high controlling coaching behaviors. The range was 1 – 5.8 and the mean \pm standard deviation score produced was 3.07 ± 1.09 which indicates slight variability of scores around the mean. In general athletes had low perceptions of controlling coaching behaviors as the sample mean is below the scale median.

Autonomy Supportive Coaching Behavior

Participants rated perceptions of autonomy supportive coaching behaviors on a Likert scale ranging from 1 – 7 with a higher score representing perceptions of high autonomy supportive coaching behaviors. The range was 1 – 7 and the mean \pm standard deviation score produced was 4.67 ± 1.48 which indicates moderate variability of scores around the mean. In

general athletes had high perceptions of autonomy supportive coaching behaviors as the sample mean is above the scale median.

Positive Teammate Interactions

Participants rated perceptions of positive teammate interactions on a Likert scale ranging from 1 – 4 with a higher score representing perceptions of high positive teammate interactions. The range was 1 – 4 and the mean \pm standard deviation score produced was 3.46 ± 0.53 which indicates low variability of scores around the mean. In general athletes had high perceptions of positive teammate interactions as the sample mean is above the scale median.

Negative Teammate Interactions

Participants rated perceptions of negative teammate interactions on a Likert scale ranging from 1 – 4 with a higher score representing perceptions of high negative teammate interactions. The range was 1 – 3.6 and the mean \pm standard deviation score produced was 2.12 ± 0.65 which indicates low variability of scores around the mean. In general athletes had neutral perceptions of negative teammate interactions as the sample mean is near the scale median.

Teammate Academic Social Support

Participants rated perceptions of teammate academic social support on a Likert scale ranging from 1 – 5 with a higher score representing perceptions of high teammate academic social support. The range was 1 – 5 and the mean \pm standard deviation score produced was 3.29 ± 0.97 which indicates slight variability of scores around the mean. In general athletes had high perceptions of teammate academic social support as the sample mean is above the scale median.

Coach Academic Social Support

Participants rated perceptions of coach academic social support on a Likert scale ranging from 1 – 5 with a higher score representing perceptions of high coach academic social support.

The range was 1 – 5 and the mean \pm standard deviation score produced was 3.27 ± 0.97 which indicates slight variability of scores around the mean. In general athletes had high perceptions of coach academic social support as the sample mean is above the scale median.

Athlete Burnout

Participants rated perceptions of athlete burnout on a Likert scale ranging from 1 – 5 with a higher score representing perceptions of high athlete burnout. The range was 1 – 4.7 and the mean \pm standard deviation score produced was 2.31 ± 0.65 which indicates low variability of scores around the mean. In general athletes had neutral perceptions of athlete burnout as the sample mean is just below the scale median.

Athlete Engagement

Participants rated perceptions of athlete engagement on a Likert scale ranging from 1 – 5 with a higher score representing perceptions of high athlete engagement. The range was 1 – 5 and the mean \pm standard deviation score produced was 4.16 ± 0.64 which indicates low variability of scores around the mean. In general athletes had high perceptions of athlete engagement as the sample mean is above the scale median.

Student Burnout

Participants rated perceptions of student burnout on a Likert scale ranging from 0 – 6 with a higher score representing perceptions of high student burnout. The range was 0.4 – 4.93 and the mean \pm standard deviation score produced was 2.17 ± 0.80 which indicates low variability of scores around the mean. In general athletes had low perceptions of student burnout as the sample mean is below the scale median.

Student Engagement

Participants rated perceptions of student engagement on a Likert scale ranging from 0 – 6 with a higher score representing perceptions of high student engagement. The range was 0 – 5.3 and the mean \pm standard deviation score produced was 3.14 ± 0.85 which indicates low variability of scores around the mean. In general athletes had neutral perceptions of student engagement as the sample mean is near the scale median.

Summary

In general, the sample of student athletes had perceptions of low controlling coaching behaviors, high autonomy supportive coaching behaviors, high positive teammate interactions, neutral negative teammate interactions, high teammate academic social support, high coach academic social support, neutral athlete burnout, high athlete engagement, low student burnout, and neutral student engagement. See Table 1 for all descriptive results.

Correlation Results

Controlling Coaching Behavior

Controlling coaching behaviors were positively and significantly correlated with athlete burnout ($r = 0.36; p < .05$) and student burnout ($r = 0.26; p < .01$) in the expected directions. Controlling coaching behaviors had a medium correlation with athlete burnout and explained 13% of the variance of athlete burnout and had a small correlation with student burnout and explained 7% of the variance of student burnout. Controlling coaching behaviors were not significantly correlated with athlete engagement ($r = -0.12; p > .05$) or student engagement ($r = -0.03; p > .05$). Athletes who perceived coaches as controlling were more likely express symptoms of being burned out academically and athletically than were athletes who viewed their coaches as less controlling.

Autonomy Supportive Coaching Behavior

Autonomy supportive coaching behaviors were negatively and significantly correlated with athlete burnout ($r = -0.50$; $p < .01$) and student burnout ($r = -0.20$; $p < .01$), and positively associated with athlete engagement ($r = 0.39$; $p < .01$). All correlations were in the expected directions. Autonomy supportive coaching behaviors had a large correlation with athlete burnout and explained 25% of the variance of athlete burnout, had a medium correlation with athlete engagement and explained 15% of the variance of athlete engagement, and had a small correlation with student burnout and explained 4% of the variance of student burnout. Autonomy supportive coaching behaviors were not significantly correlated with student engagement ($r = 0.07$; $p > .05$). Athletes who viewed their coaches as supporting their autonomy were less likely to express symptoms of athletic or academic burnout and were more likely to be engaged athletically than athletes who perceived their coaches to be less autonomy supportive.

Positive Teammate Interactions

Positive teammate interactions were significantly negatively related with athlete burnout ($r = -0.16$; $p < .05$) and significantly positively related to athlete engagement ($r = 0.24$; $p < .01$) in the expected directions. Positive teammate interactions had a small correlation with athlete burnout and athlete engagement and explained 3% of the variance of athlete burnout and 6% of the variance of athlete engagement. Positive teammate interactions were not significantly correlated with student burnout ($r = -0.11$; $p > .05$) or student engagement ($r = 0.11$; $p > .05$). Athletes who felt they had positive interactions with their teammates were less likely to express symptoms of athlete burnout and more likely to be engaged athletically than were athletes who felt less satisfied with positive interactions with their teammates.

Negative Teammate Interactions

Negative teammate interactions were positively and significantly correlated with athlete burnout ($r = 0.23$; $p < .01$) in the expected direction and explained 5% of the variance of athlete burnout. Negative teammate interactions were not significantly correlated with athlete engagement ($r = -0.12$; $p > .05$), student burnout ($r = 0.10$; $p > .05$) or student engagement ($r = 0.05$; $p > .05$). Athletes who felt they had negative interactions with their teammates were more likely to show symptoms of athlete burnout than athletes who were less bothered by negative interactions with their teammates.

Teammate Academic Social Support

Teammate academic social support was positively and significantly correlated with athlete engagement ($r = 0.16$; $p < .05$) and student engagement ($r = 0.18$; $p < .05$) in the expected directions. Teammate academic social support explained 3% of the variance of athlete engagement and 3% of the variance of student engagement. Teammate academic social support was significantly negatively related to student burnout ($r = -0.21$; $p < .01$) in the expected direction and explained 4% of the variance of student burnout. Teammate academic social support had a small correlation with athlete engagement, student burnout, and student engagement. Teammate academic social support was not significantly correlated with athlete burnout ($r = -0.11$; $p > .05$). Athletes who felt they had academic support from their teammates were more likely to be engaged athletically and academically and less likely to show symptoms of academic burnout than were athletes who did not feel they had academic support from their teammates.

Coach Academic Social Support

Coach academic social support was positively and significantly correlated with athlete engagement ($r = 0.33$; $p < .01$) and student engagement ($r = 0.15$; $p < .05$) in the expected

directions. Coach academic social support had a medium correlation with athlete engagement and explained 11% of the variance of athlete engagement, and had a small correlation with student engagement and explained 2% of the variance of student engagement. Coach academic social support was negatively and significantly correlated with athlete burnout ($r = -0.39$; $p < .01$) in the expected direction and explained 15% of the variance of athlete burnout. Coach academic social support had a medium correlation with athlete burnout. Coach academic social support was not significantly correlated with student burnout ($r = -0.11$; $p > .05$). Athletes who felt they had academic support from their coaches were more likely to be engaged athletically and academically and less likely to show symptoms of athlete burnout than were athletes who felt they were not academically supported by their coaches.

Summary

All significant correlations were in the hypothesized directions. Autonomy supportive coaching behaviors and controlling coaching behaviors had a medium-sized correlation with athlete burnout in the expected direction with high controlling coaching behaviors relating to high athlete burnout. Autonomy supportive coaching behaviors had a large-sized correlation with athlete burnout and a medium-sized correlation with athlete engagement in the expected directions with high autonomy supportive coaching behaviors relating to low athlete burnout and high athlete engagement. Coach academic social support had medium-sized correlations with athlete burnout and athlete engagement in the expected directions with high coach academic social support relating to low athlete burnout and high athlete engagement.

According to correlation results all predictor variables except teammate academic social support were significantly correlated with athlete burnout. Autonomy supportive coaching behaviors, coach academic social support, teammate academic social support, and positive and

negative teammate interactions were significantly correlated with athlete engagement. Comparatively, less predictor variables were significantly correlated with the student burnout and student engagement outcome variables. Controlling coaching behaviors, autonomy supportive coaching behaviors, and teammate academic social support were significantly correlated with student burnout. Teammate academic social support and coach academic social support were significantly correlated with student engagement. See Table 1 for all correlation results.

Table 1
Ranges, Means, Standard Deviations, Skewness, Kurtosis, Alpha's and Pearson Product Correlation

Variable	1	2	3	4	5	6	7	8	9	10
1. CCBS										
2. SCQ	-0.53**									
3. SASSC	-0.25**	0.62**								
4. SASST	-0.17*	0.38**	0.44**							
5. PSET	-0.17*	0.39**	0.30**	0.57**						
6. NSET	-0.16*	-0.23**	-0.16*	-0.04	-0.08					
7. ABQ	0.36*	-0.50**	-0.39**	-0.11	-0.16*	0.23**				
8. AEQ	-0.12	0.39**	0.33**	0.16*	0.24**	-0.12	-0.70**			
9. MBISS	0.26**	-0.20**	-0.11	-0.21**	-0.11	0.10	0.19**	-0.10		
10. SEQ	-0.03	0.07	0.15*	0.18*	0.11	0.05	-0.01	0.19*	-0.51**	
Scale Range	1 - 7	1 - 7	1 - 5	1 - 5	1 - 4	1 - 4	1 - 5	1 - 5	0 - 6	0 - 6
Sample Range	1 - 5.8	1 - 7	1 - 5	1 - 5	1 - 4	1 - 3.6	1 - 4.7	1 - 5	0.4 - 4.93	0 - 5.3
Mean	3.07	4.67	3.27	3.29	3.46	2.12	2.31	4.16	2.17	3.14
SD	1.09	1.48	0.97	0.97	0.53	0.65	0.64	0.64	0.80	0.85
Skewness	0.32	-0.37	-0.26	-0.42	-1.20	0.05	0.50	-0.95	0.44	-0.40
Kurtosis	-0.49	-0.44	-0.30	-0.12	2.22	-0.62	0.51	2.15	0.21	1.22
Alpha	0.90	0.94	0.93	0.93	0.94	0.92	0.91	0.96	0.86	0.91

Note. CCBS = Controlling Coaching Behaviors; SCQ = Autonomy Supportive Coaching Behaviors; SASSC = Academic Support from Coaches; SASST = Academic Support from Teammates; PSET = Positive Social Exchanges with Teammates; NSET = Negative Social Exchanges with Teammates; ABQ = Athlete Burnout; AEQ = Athlete Engagement; MBISS = Student Burnout; SEQ = Student Engagement.

*Significant at $p < .05$

**Significant at $p < .01$

Multiple Regression Results for each Research Question

Research Question 1

Do college student athlete perceptions of controlling and autonomy supportive coaching behavior, positive and negative teammate interactions predict athlete burnout and engagement?

Hypothesis 1: It is hypothesized that college student athletes' perceptions of low controlling coaching behaviors and low negative teammate interactions and high autonomy supportive coaching behaviors and high positive teammate interactions will be predictive of high athlete engagement and low athlete burnout.

Hypothesis 2: It is hypothesized that college student athlete perceptions of high controlling coaching behaviors and high negative teammate interactions and low autonomy supportive coaching behaviors and low positive teammate interactions will be predictive of low athlete engagement and high athlete burnout.

Hypotheses 1 and 2 are partially supported by results. Two multiple linear hierarchical regression analyses were conducted to examine the ability of 4 sources of influence: perceptions of controlling coaching behaviors, autonomy supportive coaching behaviors, positive social exchanges with teammates, and negative social exchanges with teammates to predict athlete burnout and athlete engagement. The prediction model for athlete burnout was statistically significant, $F(4,174) = 16.41, p < .001$, and accounted for approximately 27% of the variance ($R^2 = 0.27$; see Table 2). Athlete burnout was primarily predicted by perceptions of less autonomy supportive coaching behaviors ($p < .001$, standardized $\beta = -0.42, r_s = -0.96$). The structure coefficient supports the beta weight (Yeatts et al., 2017). The model produced an effect size of $f^2 = 0.20$ and is considered medium to large (Cohen & Cohen, 1975). The prediction model for athlete engagement was also statistically significant, $F(4,174) = 9.25, p \leq .001$, and accounted

for approximately 18% of the variance ($R^2 = 0.18$; see Table 3). Athlete engagement was primarily predicted by perceptions of more autonomy supportive coaching behaviors ($p < .001$, standardized $\beta = 0.41$, $r_s = 0.93$) (Meyers, Gamst, & Guarino, 2013). The structure coefficient supports the beta weight (Yeatts et al., 2017). The model produced an effect size of $f^2 = 0.15$ and is considered medium (Cohen & Cohen, 1975).

Table 2

Multiple regression results predicting Athlete Burnout:

Model Summary

R	R^2	F	df	$p <$	f^2
0.52	0.27	16.41	4,174	0.001**	0.20

Note. ** Significant at $p < .01$

Coefficients for Final Model

Variable	Standardized β	t	Significance	Structure Coefficient
1. CCBS	0.12	1.50	0.14	0.69
2. SCQ	-0.42	-5.1	0.001**	-0.96
3. PSET	0.03	0.43	0.67	-0.31
4. NSET	0.11	1.71	0.09	0.44

Note. CCBS = Controlling Coaching Behaviors; SCQ = Autonomy Supportive Coaching Behaviors; PSET = Positive Social Exchanges with Teammates; NSET = Negative Social Exchanges with Teammates.

**Significant at $p < .01$

Table 3

Multiple regression results predicting Athlete Engagement:

Model Summary

<i>R</i>	<i>R</i> ²	<i>F</i>	<i>df</i>	<i>p</i> <	<i>f</i> ²
0.42	0.18	9.25	4,174	0.001**	0.15

Note. ** Significant at $p < .01$

Coefficients for Final Model

Variable	Standardized β	<i>t</i>	Significance	Structure Coefficient
1. CCBS	0.13	1.56	0.12	-0.29
2. SCQ	0.41	4.62	0.001**	0.93
3. PSET	0.10	1.35	0.18	0.57
4. NSET	-0.04	-0.60	0.55	-0.29

Note. CCBS = Controlling Coaching Behaviors; SCQ = Autonomy Supportive Coaching Behaviors; PSET = Positive Social Exchanges with Teammates; NSET = Negative Social Exchanges with Teammates.

**Significant at $p < .01$

Research Question 2

Do college student athlete perceptions of controlling and autonomy supportive coaching behavior, positive and negative teammate interactions, and teammate and coach academic social support predict student burnout and engagement?

Hypothesis 3: It is hypothesized that college student athlete perceptions of low controlling coaching behaviors, low negative teammate interactions, high autonomy supportive coaching behaviors, high positive teammate interactions, high teammate academic social support, and high coach academic social support will be predictive of high student engagement and low student burnout.

Hypothesis 4: It is hypothesized that college student athlete perceptions of high controlling coaching behaviors, high negative teammate interactions, low autonomy supportive coaching behaviors, low positive teammate interactions, low teammate academic social support, and low coach academic social support will be predictive of low student engagement and high student burnout.

Hypotheses 3 and 4 are partially supported by results. Two multiple linear hierarchical regression analyses were conducted to examine the ability of six sources of influence: perceptions of controlling coaching behaviors, autonomy supportive coaching behaviors, positive social exchanges with teammates, negative social exchanges with teammates, academic support from coaches, and academic support from teammates to predict student burnout and student engagement. The prediction model for student burnout was statistically significant, $F(6,172) = 3.79$, $p < .005$, and accounted for approximately 10% of the variance ($R^2 = 0.10$; see Table 4). Student burnout was primarily predicted by perceptions of more controlling coaching behaviors ($p < .05$, standardized $\beta = 0.21$, $r_s = 0.81$) and less academic support from teammates ($p < .05$, standardized $\beta = -0.21$, $r_s = -0.66$). The structure coefficients support the beta weights (Yeatts et al., 2017). The model produced an effect size of $f^2 = 0.09$ and is considered medium to small to medium (Cohen & Cohen, 1975). The prediction model for student engagement was not statistically significant, $F(6,172) = 1.34$, $p < 0.24$ (see Table 5) (Meyers, Gamst, & Guarino, 2013).

Table 4

Multiple regression results predicting Student Burnout:

Model Summary

<i>R</i>	<i>R</i> ²	<i>F</i>	<i>df</i>	<i>p</i> <	<i>f</i> ²
0.32	0.10	3.19	6,172	0.005**	0.09

Note. ** Significant at $p < .01$

Coefficients for Final Model

Variable	Standardized β	<i>t</i>	Significance	Structure Coefficient
1. CCBS	0.21	2.36	0.02*	0.81
2. SCQ	-0.06	-0.49	0.62	-0.63
3. PSET	0.05	0.54	0.59	-0.34
4. NSET	0.06	0.82	0.41	0.31
5. SASSC	0.06	0.66	0.51	-0.34
6. SASST	-0.21	-2.18	0.03*	-0.66

Note. CCBS = Controlling Coaching Behaviors; SCQ = Autonomy Supportive Coaching Behaviors; PSET = Positive Social Exchanges with Teammates; NSET = Negative Social Exchanges with Teammates; SASSC = Academic Support from Coaches; SASST = Academic Support from Teammates.

*Significant at $p < .05$

Table 5

Multiple regression results predicting Student Engagement:

Model Summary

<i>R</i>	<i>R</i> ²	<i>F</i>	<i>df</i>	<i>p</i> <
0.21	0.05	1.34	6,172	0.24

Note. ** Significant at $p < .01$

Coefficients for Final Model

Variable	Standardized β	<i>t</i>	Significance	Structure Coefficient
1. CCBS	-0.01	-0.10	0.93	-0.14
2. SCQ	-0.05	-0.41	0.68	0.33
3. PSET	0.01	0.12	0.92	0.52
4. NSET	0.07	0.87	0.39	0.24
5. SASSC	0.12	1.17	0.24	0.71
6. SASST	0.14	1.48	0.14	0.86

Note. CCBS = Controlling Coaching Behaviors; SCQ = Autonomy Supportive Coaching Behaviors; PSET = Positive Social Exchanges with Teammates; NSET = Negative Social Exchanges with Teammates; SASSC = Academic Support from Coaches; SASST = Academic Support from Teammates.

** Significant at $p < .01$

*Significant at $p < .05$

CHAPTER 5 DISCUSSION, CONCLUSIONS, AND APPLICATION

The purpose of this section is to summarize the study findings, offer conclusions and discussion of findings relevant to current literature, discuss generalizations of findings and limitations of the study, and recommendations for future study and application.

Summary of the Study

The purpose of this study was to assess salient psychosocial predictors of both academic and athletic burnout and engagement in college student athletes. Psychosocial predictor variables that were assessed included perceptions of controlling coaching behaviors, autonomy supportive coaching behaviors, positive and negative teammate interactions, and coach and teammate academic social support. Based on the theoretical and empirical considerations outlined in chapters 1 through 3 the following research questions and hypotheses were developed:

Research Question 1: Do college student athlete perceptions of controlling and autonomy supportive coaching behavior, positive and negative teammate interactions predict athlete burnout and engagement?

Research Hypothesis 1: It is hypothesized that college student athlete perceptions of low controlling coaching behaviors and low negative teammate interactions and high autonomy supportive coaching behaviors and positive teammate interactions will be predictive of high athlete engagement and low athlete burnout.

Research Hypothesis 2: It is hypothesized that college student athlete perceptions of high controlling coaching behaviors and high negative teammate interactions and low autonomy supportive coaching behaviors and low positive teammate interactions will be predictive of low athlete engagement and high athlete burnout.

Research Question 2: Do college student athlete perceptions of controlling and autonomy supportive coaching behavior, positive and negative teammate interactions, and teammate or coach academic social support predict student burnout and engagement?

Research Hypothesis 3: It is hypothesized that college student athlete perceptions of low controlling coaching behaviors and low negative teammate interactions and high autonomy supportive coaching behaviors, positive teammate interactions, and academic teammate and coach social support will be predictive of high student engagement and low student burnout.

Research Hypothesis 4: It is hypothesized that college student athlete perceptions of high controlling coaching behaviors and high negative teammate interactions and low autonomy supportive coaching behaviors, low positive teammate interactions, and high academic teammate and coach social support will be predictive of low student engagement and high student burnout.

These research questions and hypotheses were assessed using a cross-sectional questionnaire methodology in which 179 of 299 (60%) potential student athletes from a Midwestern NCAA Division I university participated.

Conclusions and Discussion

Research question conclusions are stated and followed by a comparison of findings to the relevant literature and a discussion of the meaningfulness of the findings (i.e., effect sizes).

Research Question 1

Do college student athlete perceptions of controlling and autonomy supportive coaching behavior, positive and negative teammate interactions predict athlete burnout and engagement?

To answer research questions 1 and 2 multiple regression analyses were completed of which the first prediction model for athlete burnout was statistically significant and accounted for approximately 27% of the variance (see Table 2). Athlete burnout was primarily predicted by

perceptions of less autonomy supportive coaching behaviors. The model produced an effect size of $f^2 = 0.20$ and is considered medium to large (Cohen & Cohen, 1975). Stated differently, athletes who felt misunderstood by their coach, felt their coach did not provide options and choices, and who felt their coach was not confident in their sport ability were exhausted from their training, felt they were not achieving much in sport, and did not care about their sport performance as much as in the past. Additionally, the second prediction model for athlete engagement, the conceptual opposite of athlete burnout, was also statistically significant and accounted for approximately 18% of the variance (see Table 3). Athlete engagement was primarily predicted by perceptions of more autonomy supportive coaching behaviors. The variance accounted for in the model produced an effect size of $f^2 = 0.15$ and is considered medium (Cohen & Cohen, 1975). Stated differently, athletes who felt understood by their coach, felt their coach provided options and choices, and who felt their coach had confidence in their sport ability, believed in their ability to accomplish their sport goals, felt determined and devoted to their sport, and enjoyed their sport participation were engaged in their sport.

Current study findings are supported by relevant literature (Altahayneh, 2003; Amorose and Butcher, 2015; Isoard-Gautheur, Guillet-Descas, & Lemyre, 2012; Quested and Duda, 2011). In the following sections I discuss each of these 4 studies. First, Altahayneh (2003) assessed Jordan university coaches' perceptions of coach burnout and leadership styles (Leadership Scale for Sports; LSS) and athletes' perceptions of athlete burnout, coaches' leadership styles, and athlete satisfaction. Within the LSS 5 leadership attributes are assessed: training and instruction, autocratic behavior, democratic behavior, social support, and positive feedback. When comparing the LSS with the autonomy supportive coaching behaviors (SCQ) used in the current study it is important to note that democratic behavior and autocratic behavior

are most closely positively and negatively, respectively, related to autonomy supportive coaching behaviors. Correlation analyses revealed statistically significant ($p < .01$) negative relationships between athlete perceptions of democratic behavior and the 3 factors of athlete burnout: devaluation of sport ($r = -0.66$), reduced sense of accomplishment ($r = -0.69$), and emotional and physical exhaustion ($r = -0.64$). Stated differently, athletes who perceived their coaches to have democratic behaviors, similar to autonomy supportive behaviors, were less likely to exhibit symptoms of athlete burnout.

Statistically significant ($p < .01$) positive relationships were revealed between autocratic coaching behaviors and the 3 factors of athlete burnout: devaluation of sport ($r = 0.47$), reduced sense of accomplishment ($r = 0.56$), and emotional and physical exhaustion ($r = 0.52$). Stated differently, athletes who perceived their coaches to have autocratic behaviors, similar to controlling behaviors, were more likely to exhibit symptoms of athlete burnout. Altahayneh's (2003) findings support the current results as current multiple regression results indicate that autonomy supportive coaching behaviors was the most important variable in predicting athlete burnout and athlete engagement. In other words, low autonomy supportive coaching behaviors predicted athlete burnout while high autonomy supportive coaching behaviors predicted athlete engagement.

Second, Amorose and Anderson-Butcher (2015) examined perceived autonomy supportive coaching behaviors, perceived controlling coaching behaviors, motivational regulations, basic need satisfaction, and athlete burnout of athletes who ranged in age from 14 to 18 years old ($N = 301$). Correlation analyses showed autonomy supportive coaching behaviors ($r = -0.43$) and controlling coaching behaviors ($r = 0.55$) were significantly ($p < .05$) related to athlete burnout in the expected directions. These results support the current study's correlational

results. Amorose and Anderson-Butcher (2015) also completed hierarchical regression analyses in order to determine the ability of coaching behaviors and the interaction of autonomy supporting and controlling coaching behaviors, to predict motivational regulations, basic need satisfaction, and athlete burnout. A statistical interaction is used to describe a situation in which 2 variables (e.g., autonomy supportive coaching behaviors and controlling coaching behaviors) simultaneously influence a third variable (e.g., athlete burnout) and the influence is not cumulative. Results concerning athlete burnout showed step 1: autonomy supportive ($sr^2 = 0.21$) and controlling coaching behaviors ($sr^2 = 0.44$) significantly predicted athlete burnout $F = 76.64, p < .05$, and accounted for approximately 33% of the variance ($R^2 = 0.33$). The second step of adding the interaction term was also significant ($p < .05$), although it only explained an additional 2% of the variance ($R^2 = 0.35; \Delta R^2 = 0.02$) of athlete burnout. In other words, athletes who perceived lower controlling coaching behaviors and lower autonomy supportive coaching behaviors had lower athlete burnout than athletes who perceived higher controlling coaching behaviors and lower autonomy supportive coaching behaviors. Also, athletes who perceived lower controlling coaching behaviors and higher autonomy supportive coaching behaviors had lower athlete burnout than athletes who perceived higher controlling coaching behaviors and higher autonomy supportive coaching behaviors. These findings suggest that the interaction of the presence of both a negative (i.e., controlling coaching behaviors) and a positive (i.e., autonomy supportive coaching behaviors) sporting environment adds to the explanation of athlete burnout.

Contradictory to the current study's findings, Amorose and Anderson-Butcher (2015) also found athlete perceptions of controlling coaching behaviors to be a significant predictor of athlete burnout and stated that increasing autonomy supportive coaching behaviors *and*

decreasing controlling coaching behaviors is crucial for enhanced positive athlete outcomes in the form of intrinsic motivation, satisfaction of basic needs, and decreased athlete burnout. However, regarding athlete burnout, the current study only supports the need for increased autonomy supportive coaching behaviors in order to decrease athlete burnout. Further study must be completed in order to determine the value of paying attention to both types of coaching behaviors or whether it is more efficient and a coach gets more “bang for their buck” by paying attention to the improvement of autonomy supportive coaching behaviors only.

Third, Isoard-Gauthier and colleagues (2012) assessed 209 (males = 152) high school student athletes enrolled in an elite sport training center in France at two time points: 2 months after the start of the season and near the end of the season. Autonomy supportive coaching style, three basic needs satisfaction, self-determined motivation, and athlete burnout were assessed. All measures were completed at both time points. Concerning coaching behaviors and athlete burnout, structural equation modelling (SEM) revealed autonomy supportive coaching behaviors had a negative mediating influence through the basic needs of autonomy and competence, intrinsic motivation (IM) to know and to accomplish, and extrinsic motivation (EM) identified on one factor of athlete burnout: reduced sense of accomplishment (total effect = -0.14; $p < .01$). Stated differently, athletes who perceived their coach to be autonomy supportive were more likely to have their basic needs of competence and autonomy satisfied, more likely to be intrinsically motivated to know and to accomplish, more likely to have identified EM and were less likely to experience the symptom of burnout: feeling a reduced sense of accomplishment in their sport. Isoard-Gauthier and colleagues' (2012) findings are in agreement with the current study's findings as primarily perceptions of low autonomy supportive coaching predicted athlete

burnout, while perceptions of controlling coaching behaviors was not a significant predictor of athlete burnout in the current study's model.

Fourth, Similar to Isoard-Gauthier and colleagues (2012), Quested and Duda (2011) assessed three basic needs satisfaction, perceived autonomy support, and burnout over a school year of 219 elite dancers ($M_{age} = 18.44 \pm 2.29$ years) enrolled in vocational dance training. Data collection occurred at 3 time points over a 36 week duration. At time 1 burnout was assessed, at time 2 burnout, basic needs satisfaction, and perceived autonomy support was assessed, and at time 3 all variables were reassessed. SEM results supported theoretical tenets of self-determination theory (SDT) with autonomy support significantly predicting global burnout in the expected direction through the mediation model of satisfaction of three basic needs. Stated differently, elite dancers who felt their environment was autonomy supportive was more likely to have their three basic needs satisfied, and in turn less likely to feel burn out. Conclusions state the importance of implementing and maintaining an autonomy supportive environment for elite dancers in order to prevent burnout. Although Quested and Duda (2012) did not examine the conceptual opposite of autonomy supportive trainer behaviors, controlling trainer behaviors, their findings regarding the significant prediction of burnout through autonomy supportive environments supports the current study's results regarding college student athlete outcomes.

Research Question 2

Research question 2 was exploratory and asked: *Do college student athlete perceptions of controlling and autonomy supportive coaching behavior, positive and negative teammate interactions, and teammate and coach academic social support predict student burnout and engagement?* To answer research question 2, multiple regression analyses were completed of which the first prediction model for student burnout was statistically significant and accounted

for approximately 10% of the variance (see Table 4). Student burnout was primarily predicted by perceptions of more controlling coaching behaviors and less academic support from teammates. The variance accounted for in the model produced an effect size of $f^2 = 0.09$ and is considered small to medium (Cohen & Cohen, 1975). Stated differently, athletes who felt their coach was less friendly and supportive if they were not training and competing well, felt intimidated by their coach, and who felt their coach tried to control their free time and who also felt their teammates did not encourage them to study or did not make sure they got to class had high student burnout. Student burnout can be seen when a student is exhausted from studying and attending classes, is less interested in their classes, doubts the significance of their studies, and does not believe they are a good student. However, the second prediction model for student engagement, the conceptual opposite of student burnout, was not statistically significant (see Table 5). Thus, college student athletes' perceptions of controlling and autonomy supportive coaching behavior, positive and negative teammate interactions, and teammate and coach academic social support were not found to be predictive of student engagement.

Research question 2 was exploratory and although not contradictory to the current study's findings that controlling coaching behaviors and teammate academic social support were important predictors of student burnout, Gayles and Hu (2009a; 2009b) offer a different insight into potential influences on college student athlete academic outcomes. Gayles and Hu (2009a; 2009b) examined the extent to which college student athletes participate in non-athletic, educational activities and how this participation effected student engagement, and student learning and development. Data from the Basic Academic Skills Study (BASS) conducted by the NCAA was used to examine these characteristics of college student athletes. A major finding from Gayles and Hu (2009a; 2009b) was of the 4 student engagement measures (interaction with

faculty, interaction with students other than teammates, student organizations and other activities, academic related activities) student athletes most frequently engaged with students other than teammates. This finding suggests student athlete interactions with non-athlete peers, for example interacting with a classmate to prepare for a class project, may be a key factor in predicting high student engagement which in turn may affect positive educational outcomes.

Gayles and Hu (2009a; 2009b) found college student athletes of female, low-profile sports (e.g., women's cross country) interacted more with non-athlete peers than student athletes of male, high profile sports (e.g., men's football). High profile (HP) sport student athletes interacted less with non-athlete peers than low profile (LP) sport student athletes (effect size = -0.269) and male athletes had less interactions with non-athlete peers than female athletes (effect size = -0.353). Effect size was defined as $M_{HP} - M_{LP} / \sigma_{overall}$. This is an important insight as the current study's exploratory prediction model for student engagement, which did not include non-athlete peer academic social support or positive/negative interactions nor gender or sport type, was not statistically significant. The current study's findings reveal college student athletes' perceptions of controlling and autonomy supportive coaching behavior, positive and negative teammate interactions, and teammate and coach academic social support were not found to be predictive of student engagement. Other variables of interest when considering the outcome of student engagement among college student athletes may include interaction with non-athlete peers, interactions with university faculty such as professors or advisors, and engagement in the larger university culture as suggested by Gayles and Hu (2009a; 2009b).

Generalizations

Findings from this study can be generalized in limited contexts although such generalizations should be made cautiously as the methodology was cross-sectional and the

sample was small and only included student athletes from 1 midwestern US institution and primarily from 4 sport teams: swimming and diving, soccer, basketball, and cross country. Findings regarding the value of autonomy supportive behaviors in relation to positive outcomes are well-documented in previous literature. Additionally, generalizability is limited as the current sample was about 79% Caucasian and the sample of college athletes was not greatly diverse. Thus, the findings from the first research question further supports the understanding of the relationship between autonomy supportive behaviors and positive outcomes, specifically in the athletic domain regarding coaching behaviors' effects relative to student athlete burnout and engagement. The second research question was exploratory, thus generalizations to the broad Division I college student athlete population should be made cautiously as further validation of these findings is necessary.

Limitations

There were various limitations to this study. The first limitation was the cross-sectional methodology as such causal relationships regarding predictor and outcome variables cannot be inferred from my results. The second limitation was the exclusive use of self-report questionnaires to collect data from participants. It is possible, especially in this sample of college student-athletes, that perceptions of athlete burnout were not fully disclosed. Although participants were explicitly told that their questionnaire answers would be kept confidential from all coaches and teammates and only the PI would see their answers, student-athletes may have withheld true perceptions of athlete burnout in order to protect their social status within their sport team. In line with this limitation, a third limitation is that my aim was to conduct a study on student athlete burnout and engagement. However, based on the mean scores of this sample the student athletes were not athletically or academically burnt out. As such, firm conclusions

regarding predictors of student and athlete burn out cannot be made. Although the inclusion of non-burnt out student athletes in a study of student athlete burnout is a weakness, assessing college student athletes who have high burnout is difficult as these student athletes are likely no longer participating in their sport. Recently, Raedeke and colleagues (2014) have noted this as a shortcoming of much athlete “burnout” research (Raedeke, Smith, Kentta, Arce, & Francisco, 2014).

A fourth limitation of this study is the sample primarily being made of 4 sport teams (male and female): basketball, soccer, swimming and diving, and cross country. As different sport teams experience different coaching behaviors and teammate interactions due to the various sport climates that exist it is a limitation to have approximately three-quarters of the sample come from only 4 different sport atmospheres as a total of 11 different sports exist at the local university.

A fifth limitation of the study was the various timing of data collection in relation to sport season and academic year. Due to logistical constraints of training and competition schedules as well as course schedules of student athletes, subjects were not able to complete questionnaires at the same time point in their season or academic year. In line with this limitation, if sport teams were not able to complete questionnaires until the end of their sport season we often were unable to include senior athletes, regardless of time during the academic year, as their involvement with their sport team was complete. Therefore, we potentially lost valuable participants as senior athletes may have been more likely to experience student and/or athlete burnout as their time of involvement in both college athletics and academics had been the longest compared to freshmen student athletes. Although these limitations exist, they provide direction for improvements to be made in future research concerning psychosocial predictors of college student athlete burnout

and engagement. These are discussed specifically in the following recommendations for future study section.

Recommendations for Future Study

In order to strengthen our understanding of self-determination theory and its application to the college sport environment future researchers should aim to include variables from multiple SDT mini-theories. Jowett and colleagues (in press) used SEM to examine perceptions of coaching behaviors, self-determined motivation, satisfaction of basic needs, and positive psychological outcomes such as well-being of elite athletes from various cultural backgrounds (e.g., China, Greece, Spain, Sweden, UK). Applying this methodology to college student athlete research regarding SDT variables in both the athletic and academic domain would create greater generalizability of findings. Additionally, Vallerand and Losier (1999) proposed a motivational sequence for athlete outcomes using SDT. The proposed sequence starts with social factors (i.e., coaching behavior, success/failure) impacting psychological mediators (i.e., basic needs satisfaction) which impacts motivation (i.e., intrinsic, extrinsic, amotivation) which lastly impacts athlete consequences or outcomes (i.e., persistence, commitment, affect). For example, a negative perception of coaching behaviors may lead to decreased satisfaction of the 3 basic needs which may result in extrinsic motivation or amotivation and then negative athlete outcomes such as decreased sport performance. Examination of this sequence among college student athletes, with the inclusion of academic outcomes (e.g., student burnout and student engagement) would increase our understanding of the reach environmental sport factors have on college student athletes.

Furthermore, future researchers should aim to strengthen future studies regarding college student athlete burnout and engagement through assessing variables at various time points

throughout the academic year and sport seasons in order to understand the causal relationships that exist between perceptions of coach-athlete and teammate-athlete relationships and student-athlete outcomes. Similar to the methodology of Isoard-Gauthier and colleagues (2012), pre- and post- sport season time points should be assessed in order to determine changes in burnout and engagement measures of student athletes in future studies. Future researchers should also aim to include other measures of athlete burnout that are not self-report measures including coach report or observation in order to further validate the current measure of athlete burnout.

Future researchers should also aim to include more athletes as well as include more athletes from a greater number of sport teams in order to permit greater generalizability of results. Additionally, multiple various university student athletes should be included in future study of academic and athletic burnout and engagement also to permit greater generalizability of results. In future studies the perceptions of non-athlete peers and professors on academic outcomes of student athletes within the academic domain would be critical to assess as both groups represent important social influences on student athletes. Future researchers should also aim to compare the academic outcomes of athletes to non-athletes in order to determine if student athletes are at a greater risk for possible perilous academic outcomes as compared to non-athletes. Lastly, objective sport performance (e.g., points scored, season PR, rebounds, assists) and academic outcomes (e.g., GPA, credit hours, course difficulty) should be included as outcome variables in order to further link psychosocial outcomes such as burnout and engagement to relatable, tangible outcomes that individuals such as coaches, athletic directors, professors, or institution officials may find meaningful.

Recommendations for Application

Given the correlational nature of this study my commentary on the applied ramifications of the results is offered with caution. These findings offer important insight into the various factors that may influence important psychological outcomes of college student athletes in both the academic and athletic domains. As stated previously, understanding such factors is important as success in both domains, school and athletics, leads to well-rounded college student-athletes. These findings also can help inform college student-athlete interventions with a similar goal of generating well-rounded student athletes. Findings from this study indicate the importance of the coach-athlete relationship in athlete outcomes of athlete burnout and engagement. Coaches should aim to create an autonomy supportive coaching climate in which athletes feelings of autonomy are enhanced. This can be accomplished through coaches helping athletes to understand the rationale of their training regimens and listen to an athletes' input regarding their training as well. These actions may allow an athlete to feel they are a self-governing individual and increase the satisfaction of their basic need to feel autonomous. In turn, as shown in this study, feelings of athlete burnout may be diminished as feelings of athlete engagement may be enhanced which is ideal when concerned with overall athlete well-being.

Furthermore, although exploratory, the findings from my second research question suggest decreasing controlling coaching behaviors and increasing teammate academic social support may be important in thwarting feelings of student burnout in student athletes. Decreasing controlling coaching behaviors can be accomplished through coaches initiating a change in their behaviors such as decreasing insults and punishments of athletes when they do not agree with them or when they do not perform as well as a coach believes they should and increasing positive and supportive statements toward athletes. Additionally, coaches should aim to create a healthy sport-life balance for student athletes so athletes do not feel overwhelmed or trapped by

their coach and/or sport participation (Kroshus & DeFreese, in press). Increasing teammate academic social support can be accomplished through 3 approaches, not mutually exclusive: 1) creating opportunities for teammate academic social support to occur through team study times, 2) appointing student athlete leaders within in the team to initiate such social support to all teammates thus creating an atmosphere of academic social support that may trickle down to all teammates, and 3) having coaches implement a team culture of teammate academic social support by emphasizing the importance of student athletes supporting academic endeavors and achievements of their teammates.

Much work must still be completed regarding what influences a college student athlete's outcomes in academic and athletic domains in order to inform critical interventions in this unique population. This study, with the inclusion of SDT as a theoretical framework, offers great insight into the importance of student athletes' perceptions of coach and teammate relationships as they relate to burnout and engagement. In conclusion, university athletic programs and their coaches need to be aware of the great importance they hold in the lives of college student athletes. The behaviors of coaches can greatly effect a student athlete in positive (i.e., athlete engagement) and negative (i.e., athlete burnout, student burnout) ways. Regarding the findings of the current study, this is especially true in the athletic domain. However, a coaches' impact is far reaching, as also seen in the current exploratory study's findings as controlling coaching behaviors significantly predicted student burnout. This construct of student burnout, likely linked with objective academic outcomes and future career possibilities, is also impacted by teammate academic social support. The college sport team wholly has the potential and great power to positively or negatively impact student athletes athletically and academically which translates through to life post-college. This influential power must be yielded responsibly.

APPENDIX A

NOTICE OF EXPEDITED APPROVAL

To: Brigid Byrd
Kinesiology, Health and Sport Studies
3278 Coolidge Highway

From: Dr. Deborah Ellis or designee G. Kusch / 2-2
Chairperson, Behavioral Institutional Review Board (B3)

Date: September 15, 2016

RE: IRB #: 094716B3A
Protocol Title: Student-Athlete Surveillance System, Investigation and Experimental (SASSIE) Project
Funding Source:
Protocol #: 1609015245

Expiration Date: September 14, 2017

The above-referenced Administrative Application request for you to use another IRB as the IRB of Record was APPROVED on 09/15/2016. The IRB Administration Office is in receipt of 1) the IRB Approval Letter from the IRB of Record Institution indicating that Wayne State University has been approved as an additional site under their approved protocol 2) Wayne State University's IRB Authorization to Use Another IRB for Protocol Approval Agreement with appropriate signatures; and 3) an Administrative Application appropriately completed and signed by the principal investigator.

- Administrative Application received in the IRB Office 08/30/2016
- Authorization for WSU Researcher to use another IRB of record
- Name of IRB of Record: Oakland University
- Receipt of Wayne State University IRB Authorization to use Another IRB for Protocol Approval Agreement signed & dated by PI on 8/24/2016 and signed by IRB Institutional Official 9/15/2016

- Please forward a copy of this approval memo and attached agreement to the collaborating institution's IRB upon receipt.
- All amendments and correspondence should be directed to the collaborating institution's IRB, unless instructed by that institution to send a copy to the WSU IRB Administration Office.
- Yearly Continuation approval from the collaborating institution must be submitted to the WSU IRB Administration Office along with an updated Administrative Application (check the continuation box at the top of the form). This submission should be received at least six weeks before the expiration date.
- Please reference the Protocol # (above) on all communication to the IRB Administration Office related to this research.
- Failure to receive approval for continuation before the expiration date will result in the automatic suspension of the approval of this protocol on the expiration date. Information collected following suspension is unapproved research and can never be reported or published as research data.

Enc: Copy of signed Agreement

Notify the IRB of any changes to the funding status of the above-referenced protocol.

APPENDIX B

Consent to Participate in a Research Study (778936) Student-Athlete Surveillance System, Investigation and Experimental (SASSIE) Project

Introduction

You are being asked to participate in a multidisciplinary research study lead by Tamara Hew-Butler DPM, PhD in conjunction with Oakland University Athletics. The purpose of this consent form is to let you know more about the study so you can decide whether to volunteer for the study or not. Please read the form carefully. You may ask questions about why the research is being done, what you will be asked to do, the possible risks and benefits, your rights as a volunteer, and anything else about the research or this form that is not clear. You may talk with your friends and family about this research study before making your decision. When all your questions have been answered, you can decide if you want to be in this study. This process is called ‘informed consent.’ If you decide to participate you will be asked to sign this form and will receive a copy of the form.

Why is this study being done?

The purpose of this research study is to observe changes in your anthropometric characteristics (height and weight), heart rate and blood pressure, performance (endurance and strength), body composition (lean mass, fat mass and bone tissue), athlete burnout and stress, metabolic status (through blood and urine collection) and injuries (including illness) during the competitive season. Additionally, we want to evaluate your current knowledge on sports nutrition and assess your nutrient intake. Ultimately, we want to assess the benefits and possible risks associated with student-athlete training and competition during the entire academic school year.

Who can participate in this study?

You are being asked to participate in the study because you are between 18-30 years of age and a member of Oakland University’s 2015-2016 sports teams (student-athlete). All females who are pregnant or think they might be pregnant will be excluded from participating in this study as well as those who have a history of fainting with blood draws.

Who is sponsoring this study?

This study is not currently funded.

Where is this study being done?

Pre-season, mid-season and post-season laboratory testing for this research study will be conducted in the Prevention Research Center, located on the second floor of the Human Health Building. The vertical jump test will be conducted in Oakland University’s Athletic Training Center.

What procedures are involved with this study?

This ongoing study is an opportunity to observe athletes for research purposes. The research team will be gathering data at three time segments that will be defined for research purposes as the following: Test 1) “before” the academic year begins (denoted as "pre-season" measurements obtained during August/September); Test 2) “during” the academic year measurements (denoted as "mid-season"

measurements obtained during December/January); and Test 3) “after” the academic year ends (denoted as "post-season" measurements obtained during April/May). The pre-season, mid-season and post-season measurements will be conducted in the Prevention Research Center and Athletic Training Center (vertical jump) and will consist of measurements of anthropometrics, heart rate and blood pressure, performance (endurance and strength), body composition (lean mass, fat mass and bone tissue), knowledge of sports nutrition (from a Sports Nutrition Knowledge Questionnaire) as well as an assessment of your typical food intake, plus a few specific biochemistry measurements (24-hour urine collection and a blood sample). We will also be assessing athlete burnout, physical discomfort, and sport climate perceptions by having you fill out questions in our psychosocial athlete questionnaires. We want to measure nutritional intake and pre- to post-season improvements in performance and body composition across a full academic year while assessing injury and illness risks during the season as well. The above-mentioned procedures are detailed more specifically below:

Pre-season, mid-season and post-season Laboratory Measurements:

Anthropometric measures (height and weight), demographic (age and sex), heart rate, and standing and seated blood pressure will be obtained.

Performance Measures: Endurance

Aerobic fitness will be directly assessed by a VO_2 Peak treadmill running test. For this test, you will be allowed to warm-up on the treadmill for 5 minutes or until you feel “loose” enough to run. A mask will be placed over your nose and mouth so that we can directly measure aerobic fitness (how much oxygen the body can utilize during maximal exercise). The VO_2 Peak treadmill running test will then be conducted as follows: after a comfortable speed is self-selected, the treadmill speed will be increased 0.5 mph every 60 seconds until you can no longer keep pace with the treadmill. The VO_2 Peak test ends once you voluntarily step off or stop the treadmill. For most people, this running test will take approximately ten minutes.

Performance Measures: Strength

The vertical jump test is performed as part of standard practice by experienced strength and conditioning coaches, as part of their initial assessment within the training room. A vertical jump test will be measured using a Vertic (an apparatus consisting of horizontal vanes, each measuring a half-inch, which are rotated out of the way by the hand to indicate the maximum jump height reached). First, a “standing height” will be obtained, standing with one arm extended over your head. Next, you will be asked to jump up and touch the highest possible vane. Peak vertical jump height will be measured as the difference between your standing height and peak jumping height. The strength and conditioning coaches will oversee this assessment pre-season, mid-season and post-season. Here is a picture of a vertical jump test using a Vertic device to measure maximum jump height:



Body Composition: dual x-ray absorptiometry (DXA) Scan

For this measurement of lean mass, fat mass and bone tissue, you will be asked to lie flat on a special table located just below the DXA scan. A trained technician will position your body under the scan and you will lie still for 5 minutes until the scan is completed. The amount of fat, muscle and bone in your body will be determined by assessing the absorption rates between two separate low intensity x-ray beams (“dual x-ray”) passing through your body. You will not be able to feel or see these x-ray beams.

Here is a picture of a person undergoing a DXA scan.



Biochemistry Measurements: Blood

10mL (2 teaspoons) of blood will be taken from an arm vein by a medical professional for measurement of triglycerides (fat and cholesterol), blood glucose (blood sugar), plasma electrolytes (sodium, potassium and calcium), complete blood count, serum ferritin (iron in the blood) and vitamin D.

Biochemistry Measurements: Urine

You will be given a plastic container to collect all of your urine produced over a 24-hour period. Your urine sample will be measured for volume and a small sample will be saved for analysis which may include: 1) arsenic, lead and cadmium levels; 2) urine specific gravity (USG), which measures your hydration status; 3) total sodium and calcium concentration; and 4) urine dipstick analysis, which evaluate indicators of kidney and metabolic function. No other measurements will be analyzed in your urine.

Psychosocial Questionnaire: You will be given 1 athlete questionnaire which will evaluate perceptions of coaching behaviors, teammate interactions, academic social support, and student athlete burnout and engagement. Athlete Questionnaires will be completed while in the Prevention Research Center while waiting for the other tests to be completed.

Nutrition Analysis: 1-day dietary recall

We will ask you a few questions about your nutrition (pre-season nutrition survey). Then, we will ask you to write down, using paper and pencil, everything that you ate and drank for one entire day (24 hours). You will also be asked to estimate the quantity of each food and fluid you consumed (like 5 ounces of chicken breast or 8 ounces of whole milk) so we can calculate total caloric intake as well as macronutrient (protein, carbohydrate and fat) and micronutrient (sodium, calcium, iron etc.) intake. We will calculate

your nutrient and caloric intake by entering your dietary data into a software program called Nutritionist Pro™.

Sports Nutrition Knowledge Questionnaire: The purpose of this questionnaire is to allow researchers to better understand how well your understanding of foods may affect your eating habits and the potential for developing burnout, injury and/illness during the academic year. This questionnaire will be administered at the pre-season testing timepoint only in the Prevention Research Center for testing.

Injury/Illness data: Injury data will be obtained from the forms already used routinely (as standard practice) by the athletic trainers over the season and then coded into numbers to protect your identity.

How long will participation in this study last?

This study will begin when you arrive at Oakland University and begin your “official” training for the Fall 2015 competitive season. Therefore, pre-season laboratory testing will be conducted at the beginning of August/September 2015 with mid-season laboratory testing taking place sometime in December 2015/January 2016 and post-season testing taking place in April/May 2016. We anticipate that pre-season, mid-season and post-season laboratory testing will take a maximum of 60 minutes per testing session (3 hours maximum per year) outside of their normal training and competition routine plus 24 hours for each pre-season, mid-season and post-season urine collection/analysis. Therefore, the total anticipated time to participate in this investigation will be ~75 hours (60 minutes for each lab session plus 24 hours for urine collection performed pre, mid and post season) over a 10-month period.

The investigators may stop your participation in this study at any time without your consent. Reasons for stopping your participation would include adverse events which limit your ability to train and compete with the OU Team in which you are affiliated. Such factors would include significant illness or injury, academic probation or other unforeseen events which force you to stop training. Alternatively, you are free to withdraw from the study at any time without penalty.

How many people will be participating in this study?

We aim to recruit all members of the 2015-2016 Oakland University’s 16 sports teams (approximately 300 total student-athlete participants, including those athletes who also participated in the 2013-2014 study).

What are the risks, side effects or discomforts that can be expected from participating in this study?

All females will be asked if they are pregnant or think they may be pregnant. If the answer is yes, than that female will be excluded from participating in this study because the DXA machine (used to measure body composition) uses a small dose of radiation which may be harmful to a developing baby.

By taking part in this study, you may be at risk for the following:

Pre-season, mid-season and post-season laboratory measurements:

The main risk associated with treadmill running includes slipping off the treadmill. As an elite athlete, you are likely familiar with treadmill exercise and so your risks of falling are much lower. Nonetheless, the following safety precautions will be enforced under the auspices of the Prevention Research Center:

To avoid falling off the treadmill, handrails and spotters (spotters are research assistants placed behind the treadmill to “catch” a runner if he or she falters) will be provided as well as instructions on how to mount, dismount and stop the treadmill during the exercise trial. You can stop the treadmill at any time that you feel uncomfortable. The overall heart injury and death rate associated with exercise testing is 0.06%. This statistic includes healthy people and those with known disease. An AED (automatic external defibrillator) will be available in the Human Health Building and the PI is currently certified in CPR (cardiopulmonary resuscitation) - which includes AED use - and will be present during all training sessions. The research assistants will all carry their cell phones with them to be ready to call 911 in the event of an emergency.

The primary risks associated with the vertical jump assessment of test would be a fall during the landing phase or a strained muscle from this effort. These risks will be minimized by careful instruction and monitoring by experienced strength and conditioning coaches, who will be performing this test as part of their normal pre-season fitness assessment.

Three DXA scans (one pre-season, one mid-season and one post-season) will be performed using a Hologic Discovery A Bone Densitometer. The DXA will be performed according to the standard of medical practice. A certified technician will be performing these scans. A standardized protocol regarding correct subject positioning and preparation will be enforced. During standard operating conditions, the effective radiation dose of a single DXA scan is less than 0.5mRem which is less than ½ of the exposure obtained from one standard x-ray. Thus, the amount of total radiation exposure from three DXA scans equates to no more than 1.5mRem; which is equivalent to just over one day’s worth of natural background exposure. Additionally, a typical cross country airline flight supplies an average radiation exposure of 4mRem (equivalent to eight DXA scans) while one cigarette smoked exposes an individual to 10mRem (20 DXA scans) which is equivalent to one chest x-ray. X-rays can have harmful effects on a developing fetus (baby). If you become pregnant during this study, stop participation and notify the principle investigator, Tamara Hew-Butler, immediately.

Three invasive needle sticks (into a superficial arm vein) will be performed during this investigation (one needle stick pre-season, mid-season and another needle stick post-season measurements). Ten milliliters (mL) of blood will be collected both pre-season, mid-season and post-season. This total amount of blood (30mL) will equate to 6 teaspoons of blood (5mL = 1 teaspoon). The risks of blood draw may include: infection, delayed healing, bruising and/or inflammation at the site of vein puncture, physical discomfort, mental discomfort, fainting and feeling faint and injury to a nerve or vessel. These risks will be minimized by the use of trained professionals (Professor’s Landis-Piwowar and Hew-Butler) experienced with performing the blood draws, sterile technique and single use, disposable, materials. **Athletes with a history of previous fainting episodes secondary to blood draws should not participate in this study.** You may refuse to participate at any time that you feel uncomfortable.

Participants may experience some personal discomfort when answering the Psychosocial or Sports Nutrition Knowledge questions on the Questionnaires. If this happens, the participants can choose not to answer any of those questions.

The 1-day dietary recall (for Nutrition Analysis) is fairly straightforward. Therefore, there are no expected risks to these survey forms, as no sensitive questions are being asked. Participants may choose not to complete this record, if logging what they eat makes them uncomfortable.

There are minimal risks to non-invasive measurements of heart rate, blood pressure or urine collection.

All of your data will be “blinded” (not identified as yours). You will be assigned an unidentified subject number once you sign this consent form. The “master list” which contains the link between your name and your assigned subject number will be placed in a locked cabinet in Dr Hew-Butler’s office, separate from the actual data, once your subject number is assigned. All of your information will remain strictly confidential and your identity will not be identified in any subsequent publications or presentation of the results.

A breach of confidentiality is also a possible risk. It is possible that individuals not associated with this research may accidentally gain access to the personal information of participants. Appropriate safeguards are set in place to minimize a breach of confidentiality (e.g. researcher’s office is a secure and password protected) but no researcher can ever guarantee that this sort of breach will not occur.

There may be risks that are currently unforeseeable at this time.

What happens if you become ill or are injured because you took part in this study?

In the event of illness or injury related to the research, you should contact Tamara Hew-Butler immediately [248-364-8686 (work) or 810-375-2162 (home)]. No funds have been set aside for medical treatment in the case of injury related to research and you may be charged for treatment; however, by signing this form you are not waiving your rights to seek compensation if taking part in this study caused illness or injury. If any of your laboratory tests are abnormal, Dr Hew-Butler will counsel you in detail, in private.

Are there any known benefits from taking part in this study?

Individual and global knowledge obtained by tracking changes in performance, body composition, metabolic parameters, athlete burnout and stress, nutritional knowledge and intake, as well as injury risk during a single competitive season will be the main benefits from participating in this observational study. The tracking of injuries and illness will also provide baseline data for researchers, physicians, coaches and athletic trainers to explore trends which maximize performance, minimize injury and minimize illness in certain athlete populations.

What are the alternatives to participation in this study?

You may choose not to participate in this study.

What are the costs of taking part in the study?

There is no cost to you for participating in this study.

What compensation is being provided for participation?

None

What are your rights if you participate in this study?

Your decision to participate in this study is voluntary. You may choose to leave the study at any time, or refuse to answer any questions that may be asked during the study. You will not lose any benefits to which you are otherwise entitled and your decision will not affect your present or future relationship with Oakland University, the researcher, or the School of Health Science. If you are a student or employee at Oakland University, your decision about participation will not affect your grades or employment status.

If you would like to stop participating in this study, you should contact the principal investigator, Tamara Hew-Butler, 248-364-8686 (work), who will provide instructions on how to withdraw from the study.

Any new information that may affect your willingness to participate in the study will be provided to you as soon as possible.

What will be done to keep my information confidential?

Every effort will be made to keep your study-related information confidential.

Personal information regarding your participation in this study may be disclosed if required by law. Also, your records may be reviewed by the following groups:

- Regulatory authorities involved in the oversight of research (Office for Human Research Protections or other federal, state, or international regulatory agencies)
- Members or representatives of Oakland University Institutional Review Board (IRB) (in order to ensure that your rights as a research participant are being protected);
- The FDA may inspect the records of this research project.

When study results are presented at professional conferences or published in professional journals, your name will not be used.

What do you do if you have questions about the study?

For questions about the study you may contact Tamara Hew-Butler, DPM, PhD; 3157 Human Health Building, Oakland University, Rochester, MI 48309; Phone: 248-364-8686 (work); Email: hew@oakland.edu.

For questions regarding your rights as a participant in human subjects' research, you may contact the Oakland University Institutional Review Board, 248-370-2762.

Signing the consent form

You have read (or someone has read to you) this form. You are aware that you are being asked to participate in a research study, and you understand the possible risks and potential benefits. You have had the chance to ask questions and have had them answered to your satisfaction. You voluntarily agree to participate in this study.

You are not giving up any rights by signing this consent form. You will be given a copy of this form.

Print Name of Participant

Signature of Participant

_____AM/PM

Date and Time

Print name of person authorized to consent for participant

Signature of person authorized to consent for participant

_____AM/PM

Relationship to the participant

Date and Time

Investigator/Research Staff

I have explained the research to the participant or his/her representative before requesting the signature(s) above. There are no blanks in this document. A copy of this form has been given to the participant or his/her representative.

Signature of person obtaining the consent

Date and Time

_____AM/PM

Print name of person obtaining the consent

APPENDIX C

Demographics

1. Your age today: _____ (in years)
2. Gender: Male Female
3. What is your academic standing at Oakland University? Check one circle.
 - Freshmen
 - Sophomore
 - Junior
 - Senior
 - 5th year Senior
 - Other. Please explain: _____
4. What race do you consider yourself to be? (Check one circle. This is optional. You do not have to complete this if you do not want to.)
 - White/Caucasian/European American
 - Black/African American
 - Hispanic/Latino (Mexican, Mexican American, Chicano, Puerto Rican, Cuban, Other Spanish)
 - Arab American/Middle Eastern
 - Asian America (Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese, Other Asian)
 - American Indian/Alaska Native
 - Bengali
 - Native Hawaiian/Pacific Islander
 - Multiple Races
5. What sport do you participate in at Oakland University? Check one circle.
 - Swimming and Diving
 - Soccer
 - Basketball
 - Cross Country
 - Track and Field
 - Baseball
 - Softball

- Volleyball
- Tennis
- Golf

6. What is your competition status in your sport? Check one circle.

- Redshirt Freshmen
- Redshirt Sophomore
- Redshirt Junior
- Redshirt Senior
- True Freshmen
- True Sophomore
- True Junior
- True Senior
- 5th year Senior
- Other. Please explain: _____

7. How many years total in your life have you been competing in your sport?
_____ (years)

8. Do you have an athletic scholarship at Oakland University? Circle one.

FULL PARTIAL NO

Directions: Please complete this questionnaire thinking about the previous calendar year at Oakland University.

Controlling Coaching Behaviors Scale

Instructions: Consider your general experiences with your current coach. Please indicate how much you agree or disagree with each statement.

1. My coach tries to motivate me by promising to reward me if I do well.

1	2	3	4	5	6	7
strongly disagree						strongly agree

2. My coach only rewards/praises me to make me train harder.

1	2	3	4	5	6	7
strongly disagree						strongly agree

strongly
disagreestrongly
agree

12. My coach embarrasses me in front of others if I do not do the things he/she wants me to do.

1
strongly
disagree

2

3

4

5

6

7
strongly
agree

13. My coach expects my whole life to center on my sport participation.

1
strongly
disagree

2

3

4

5

6

7
strongly
agree

14. My coach tries to control what I do during my free time.

1
strongly
disagree

2

3

4

5

6

7
strongly
agree

15. My coach tries to interfere in aspects of my life outside of my sport.

1
strongly
disagree

2

3

4

5

6

7
strongly
agree

Sport Climate Questionnaire

1. I feel that my coach provides me with choices and options.

1
strongly
disagree

2

3

4

5

6

7
strongly
agree

2. I feel understood by my coach.

1
strongly
disagree

2

3

4

5

6

7
strongly
agree

3. My coach conveyed confidence in my ability to do well in my sport.

1
strongly
disagree

2

3

4

5

6

7
strongly
agree

3. ...suggested ways that you could deal with problems you were having?

1	2	3	4
never satisfied			very satisfied

4. ...did favors and other things for you?

1	2	3	4
never satisfied			very satisfied

5. ...provided you with aid and assistance?

1	2	3	4
never satisfied			very satisfied

6. ...helped you with an important task or something that you could not do on your own?

1	2	3	4
never satisfied			very satisfied

7. ...did or said things that were kind or considerate toward you?

1	2	3	4
never satisfied			very satisfied

8. ...cheered you up or help you feel better?

1	2	3	4
never satisfied			very satisfied

9. ...discussed personal matters or concerns with you?

1	2	3	4
never satisfied			very satisfied

10. ...provided you with good company and companionship?

1	2	3	4
never satisfied			very satisfied

11. ...included you in things they were doing?

1	2	3	4
never satisfied			very satisfied

12. ...did social or recreational activities with you?

1	2	3	4
never satisfied			very satisfied

How much were you bothered when your teammates...

13. ...gave you unwanted advice?

1	2	3	4
never bothered			very bothered

14. ...questioned or doubted your decisions?

1	2	3	4
never bothered			very bothered

15. ...interfered or meddled in your personal matters?

1	2	3	4
never bothered			very bothered

16. ...let you down when you needed help?

1	2	3	4
never bothered			very bothered

17. ...asked you for too much help?

1	2	3	4
never bothered			very bothered

18. ...failed to give you assistance that you were counting on?

1	2	3	4
never bothered			very bothered

19. ...left you out of activities you would have enjoyed?

1	2	3	4
never bothered			very bothered

20. ...forgot or ignored you?

1	2	3	4
never bothered			very bothered

21. ...failed to spend enough time with you?

1	2	3	4
never bothered			very bothered

22. ...did things that were thoughtless or inconsiderate?

1	2	3	4
never bothered			very bothered

23. ...acted angry or upset with you?

1	2	3	4
never bothered			very bothered

24. ...acted unsympathetic or critical about your personal concerns?

1	2	3	4
never bothered			very bothered

Athlete Burnout Questionnaire

1. I'm accomplishing many worthwhile things in sport.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

2. I feel so tired from my training that I have trouble finding energy to do other things.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

3. The effort I spend in sport would be better spent doing other things.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

4. I feel overly tired from my sport participation.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

5. I am not achieving much in sport.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

6. I don't care as much about my sport performance as I used to.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

7. I am not performing up to my ability in sport.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

8. I feel "wiped out" from sport.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

9. I'm not into sport like I used to be.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

10. I feel physically worn out from sport.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

11. I feel less concerned about being successful in sport than I used to.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

12. I am exhausted by the mental and physical demands of sport.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

13. It seems that no matter what I do, I don't perform as well as I should.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

14. I feel successful at sport.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

15. I have negative feelings toward sport.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

Athlete Engagement Questionnaire

1. I believe I am capable of accomplishing my goals in sport.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

2. I feel capable of success in my sport.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

3. I believe I have the skills/technique to be successful in my sport.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

4. I am confident in my abilities.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

5. I am dedicated to achieving my goals in sport.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

6. I am determined to achieve my goals in sport.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

7. I am devoted to my sport.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

8. I want to work hard to achieve my goals in sport.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

9. I feel energized when I participate in my sport.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

10. I feel energetic when I participate in my sport.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

11. I feel really alive when I participate in my sport.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

12. I feel mentally alert when I participate in my sport.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

13. I feel excited about my sport.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

14. I am enthusiastic about my sport.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

15. I enjoy my sport.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

16. I have fun in my sport.

1	2	3	4	5
almost never	rarely	sometimes	frequently	almost always

Maslach Burnout Inventory – Student Survey

1. I feel emotionally drained by my studies.

0	1	2	3	4	5	6
never						always

2. I feel used up at the end of a day at university.

0	1	2	3	4	5	6
never						always

3. I feel tired when I get up in the morning and I have to face another day at the university.

0	1	2	3	4	5	6
never						always

4. Studying or attending a class is really a strain for me.

0	1	2	3	4	5	6
never						always

5. I feel burned out from my studies.

0 1 2 3 4 5 6
never always

6. I have become less interested in my studies since my enrollment at the university.

0 1 2 3 4 5 6
never always

7. I have become less enthusiastic about my studies.

0 1 2 3 4 5 6
never always

8. I have become more cynical about the potential usefulness of my studies.

0 1 2 3 4 5 6
never always

9. I doubt the significance of my studies.

0 1 2 3 4 5 6
never always

10. I can effectively solve the problems that arise in my studies.

0 1 2 3 4 5 6
never always

11. I believe that I make an effective contribution to the classes that I attend.

0 1 2 3 4 5 6
never always

12. In my opinion, I am a good student.

0 1 2 3 4 5 6
never always

13. I feel stimulated when I achieve my study goals.

0 1 2 3 4 5 6
never always

14. I have learned many interesting things during the course of my studies.

0 1 2 3 4 5 6
never always

REFERENCES

- Adler, P. & Adler, P.A. (1985). From idealism to pragmatic detachment: The academic performance of college athletes. *Sociology of Education*, 58, 241-250.
- Altahayneh, Z. (2003). *The effects of coaches' behaviors and burnout on the satisfaction and burnout of athletes* (Doctoral dissertation). Retrieved from Florida State University Libraries.
- Amorose, A., & Anderson-Butcher, D. (2007). Autonomy-supportive coaching and self-determined motivation in high school and college athletes: A test of self-determination theory. *Psychology of Sport and Exercise*, 8, 654-670.
- Amorose, A., & Anderson-Butcher, D. (2015). Exploring the independent and interactive effects of autonomy-supportive and controlling coaching behaviors on adolescent athletes' motivation for sport. *Sport, Exercise, and Performance Psychology*, 4, 206-218.
- Amorose, A., & Horn, T. (2001). Pre- to post-season changes in the intrinsic motivation of first year college athletes: Relationships with coaching behavior and scholarship status. *Journal of Applied Sport Psychology*, 13, 355-373.
- Andersen, M., & Williams, J. (1988). A model of stress and athletic injury: Prediction and prevention. *Journal of Sport & Exercise Psychology*, 10, 294-306.
- Aries, E., McCarthy, D., Salovey, P., & Banaji, M. (2004). A comparison of athletes and nonathletes at highly selective colleges: Academic performance and personal development. *Research in Higher Education*, 45, 577-602.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.

- Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology*, 52, 1-26.
- Bartholomew, K., Ntoumanis, N., & Thogersen-Ntoumani, C. (2010). The controlling interpersonal style in a coaching context: Development and initial validation of a psychometric scale. *Journal of Sport & Exercise Psychology*, 32, 193-216.
- Blinde, E. M., Taub, D. E., & Han, L. (1993). Sport participation and women's personal empowerment: Experiences of the college athlete. *Journal of Sport & Social Issues*, 17(1), 47-60.
- Brewer, B., Andersen, M., & Van Raalte, J. (2002). Psychological aspects of sport injury rehabilitation: Toward a biopsychosocial approach. In D. Mostofsky & L. Zaichkowsky (Eds.), *Medical Aspects of Sport and Exercise* (41-54). Morgantown, WV: Fitness Information Technology.
- Brown, C., Glastetter-Fender, C., & Shelton, M. (2000). Psychosocial identity and career control in college student-athletes. *Journal of Vocational Behavior*, 56, 53-62.
- Byrd, B., Hew-Butler, T., & Martin, J. (2015). The Effects of a Running Intervention on the Physical Self- Concept of Obese Novice Adult Female Runners. *Women in Sport and Physical Activity Journal*,
- Carodine, K., Almond, K. F. and Gratto, K. K. (2001). College Student Athlete Success Both In and Out of the Classroom. *New Directions for Student Services*, 2001, 19–33.
- Carter-Francique, A., Hart, A., & Steward, A. (2013). Black college athletes' perceptions of academic success and the role of social support. *Journal of Intercollegiate Sport*, 6, 231-246.

- Chalfin, P., Weight, E., Osborne, B., & Johnson, S. (2014). The value of intercollegiate athletics participation from the perspective of employers who target athletes. *Journal of Issues in Intercollegiate Athletics*, 8, 1-27.
- Cogan, K. D., & Petrie, T. A. (1996). Counseling college women student-athletes. *Counseling college student-athletes: Issues and interventions*, 2, 77-106.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd edition). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Cohen, J., & Cohen, P. (1975). *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences*. Hillsdale: Lawrence Erlbaum Associates, Inc.
- Cohen, J., Cohen, P., West, S., & Aiken, L. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Mahwah, N.J.: L. Erlbaum Associates.
- Comeaux, E., & Harrison, K. (2011). A conceptual model of academic success for student-athletes. *Educational Research*, 40, 235-245.
- Comeaux, E., Speer, L, Taustine, M., & Harrison, C. (2011). Purposeful engagement of first-year division I student-athletes. *Journal of the First-Year Experience & Students in Transition*, 23, 35-52.
- Czekanski, W., & Turner, B. (2014). Social exchange and performance in intercollegiate athletics. *Journal of Issues in Intercollegiate Athletics*, 7, 367-389.
- Davidson, J., Sr., Moore, N., & Ullstrup, K. (2004). Religiosity and sexual responsibility: Relationships of choice. *American Journal of Health Behavior*, 28, 335-346.
- Deci, E., & Ryan, R. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.

- Deci, E., & Ryan, R. (2002). *Handbook of Self-Determination Research*. New York: The University of Rochester Press.
- DeFreese, J., & Smith, A. (2013). Teammate social support, burnout, and self-determined motivation in collegiate athletes. *Psychology of Sport and Exercise, 14*, 258-265.
- Engstrom, C. M., Sedlacek, W. E., & McEwen, M. K. (1995). Faculty attitudes toward male revenue and nonrevenue student-athletes. *Journal of College Student Development, 36*(3), 217-227.
- Fletcher, T., Benschhoff, J., & Richburg, M. (2003). A systems approach to understanding and counseling college student-athletes. *Journal of College Counseling, 6*, 35-45.
- Ford, J.A., (2007). Substance use among college athletes: A comparison based on sport/team affiliation. *Journal of American College Health, 55*, 367-373.
- Gayles, J. G., & Hu, S. (2009a). Athletes as students: Ensuring positive cognitive and affective outcomes. *New Directions for Higher Education, 148*, 101-107.
- Gayles, J.G., & Hu, S. (2009b). The influence of student engagement and sport participation on college outcomes among Division I student athletes. *The Journal of Higher Education, 80*, 315-333.
- Gill, D., & Williams, L. (2008). *Psychosocial Dynamics of Sport and Exercise* (3rd ed.). Champaign, IL: Human Kinetics.
- Gordon, S., & Lavalley, D. (2011). Career transitions. In T. Morris & P. Terry (Eds.), *The New Sport and Exercise Psychology Companion* (567-5581). Morgantown, WV: Fitness Information Technology.
- Gould, D., & Whitley, M. (2009). Sources and consequences of athletic burnout among college athletes. *Journal of Intercollegiate Sports, 2*, 16-30.

- Green, S. B. (1991). How many subjects does it take to do a regression analysis. *Multivariate behavioral research*, 26(3), 499-510.
- Green, G., Uryasz, F., Petr, T., & Bray, C. (2001). NCAA study of substance use and abuse habits of college student-athletes. *Clinical Journal of Sport Medicine*, 11, 51-56.
- Hew-Butler, T., Landis-Piwowar, K. Byrd, G., Seimer, M., Seigneurie, N., Byrd, B., & Muzik, O. (2014). Plasma irisin in runners and non-runners: no favorable metabolic associations in humans. *Physiological Reports*, 2, e12262.
- Hollembek, J., & Amorose, A. (2005). Perceived coaching behaviors and college athletes' intrinsic motivation: A test of self-determination theory. *Journal of Applied Sport Psychology*, 17, 20-36.
- Isoard-Gauthier, S., Guillet-Descas, E., & Lemyre, P. (2012). A prospective study of the influence of perceived coaching style on burnout propensity in high level athletes: Using a self-determination theory perspective. *The Sport Psychologist*, 26, 282-298.
- Jowett, S., Adie, J., Bartholomew, K., Yang, S., Gustafsson, H., & Lopez-Jimenez, A. (In press). Motivational processes in the coach-athlete relationship: A multi-cultural self-determination approach. *Psychology Sport and Exercise*
- Kroshus, E., & DeFreese, J. (in press). Athlete burnout prevention strategies utilized by U.S. collegiate soccer coaches. *The Sport Psychologist*
- Lonsdale, C., Hodge, K., & Jackson, S. (2007). Athlete engagement: II. Development and initial validation of the athlete engagement questionnaire. *International Journal of Sport Psychology*, 38, 471-492.

- Mazer, J., & Thompson, B. (2011). The validity of the student academic support scale: Associations with social support and relational closeness. *Communication Reports, 24*, 74-85.
- Medic, N., Mack, D., Wilson, P., & Starkes, J.(2004). The effects of athletic scholarships on motivation in sport. *Journal of Sport Behavior, 30*, 292-306.
- Melendez, M. (2006). The influence of athletic participation on the college adjustment of freshmen and sophomore student athletes. *College Student Retention, 8*, 39-55.
- Michigan State. (2016). *Men's Basketball*. Retrieved from:
<http://www.msuspartans.com/sports/m-baskbl/sched/msu-m-baskbl-sched.html>
- Miller, P., & Kerr, G. (2002). The athletic, academic, and social experiences of intercollegiate student-athletes. *Journal of Sport Behavior, 25*, 346-368.
- Milton, P., Freeman, D., & Williamson, L. (2012). Do athletic scholarships impact academic success of intercollegiate student-athletes: An exploratory investigation. *Journal of Issues in Intercollegiate Athletics, 5*, 329-338.
- Moore, E.W., Berkley-Patton, J.Y., & Hawes, S. M. (2013). Religiosity, alcohol use, and sex behaviors among college student-athletes. *Journal of Religion and Health, 52*, 930-940.
- Murphy, G., Petitpas, A., & Brewer, B. (1996). Identity foreclosure, athletic identity, and career maturity in intercollegiate athletes. *The Sport Psychologist, 10*, 239-246.
- NCAA. (2015a). *Current Student-Athletes*. Retrieved from: <http://www.ncaa.org/student-athletes/current>
- NCAA. (2015b). *Estimated probability of competing in professional athletics*. Retrieved from: <http://www.ncaa.org/about/resources/research/estimated-probability-competing-professional-athletics>

NCAA. (2016a). *Remaining eligible: Academics*. Retrieved from:

<http://www.ncaa.org/remaining-eligible-academics>

NCAA. (2016b). *Playing and practice season policies and procedures*. Retrieved from:

<http://www.ncaa.org/gsearch/practice%2Bhours>

NCAA. (2016c). *The value of college sports*. Retrieved from: <http://www.ncaa.org/student-athletes/value-college-sports>

NCAA Sport Science Institute. (2013). *Mental health best practices*. Indianapolis, IN: NCAA SSI.

Newsom, J., Rook, K., Nishishiba, M., Sorkin, D., & Mahan, T. (2005). Understanding the relative importance of positive and negative social exchanges: Examining specific domains and appraisals. *Journal of Gerontology*, 60B, P204-P312.

Ott, M. (2011). Faculty satisfaction with intercollegiate athletics. *Journal of Issues in Intercollegiate Athletics*, 4, 370-395.

OU. (2016). *Academic policies and procedures*. Retrieved from:

<http://catalog.oakland.edu/content.php?catoid=11&navoid=483>

Parham, W. (1993). The intercollegiate athlete: A 1990s profile. *The Counseling Psychologist*, 21, 411-429.

Paskus, T. (2012). A summary and commentary on the quantitative results of current NCAA academic reforms. *Journal of Intercollegiate Sport*, 5, 41-53.

Paule-Koba, A., & Farr, N. (2013). Examining the experiences of former D-I and D-III nonrevenue athletes. *Journal of Issues in Intercollegiate Athletics*, 6, 194-215.

- Pelletier, L., Fortier, M., Vallerand, R., Tuson, K., & Briere, N. (1995). Toward a new measure of intrinsic motivation, extrinsic motivation, and amotivation in sports: The sport motivation scale (SMS). *Journal of Sport & Exercise Psychology, 17*, 35-53.
- Petrie, T., & Hamson-Utley, J. (2011). Psychosocial antecedents of and responses to athletic injury. In T. Morris & P. Terry (Eds.), *The New Sport and Exercise Psychology Companion* (531-551). Morgantown, WV: Fitness Information Technology.
- Potuto, J., & O'Hanlon, J. (2007). National study of student-athletes regarding their experiences as college students. *College Student Journal, 41*, 947- 966.
- Prakasa, R. (1986). Psychological well-being and body image: A comparison of Black women athletes and nonathletes. *Journal of Sport Behavior, 9*, 79-91.
- Quested, E., & Duda, J. (2011). Antecedents of burnout among elite dancers: A longitudinal test of basic needs theory. *Psychology of Sport and Exercise, 12*, 159-167.
- Raedeke, T. (1997). Is burnout more than stress? A sport commitment perspective. *Journal of Sport & Exercise Psychology, 19*, 396-417.
- Raedeke, T., & Smith, A. (2001). Development and preliminary validation of an athlete burnout measure. *Journal of Sport & Exercise Psychology, 23*, 281-306.
- Raedeke, T., Smith, A., Kentta, G., Arce, C., & de Francisco, C. (2014). Burnout in Sport: From Theory to Intervention. In A.R. Homes, R. Resende, and A. Albuquerque (Eds.), *Positive Human Functioning* (113-141). New York: Nova Science Publishers.
- Reifsteck, E., Gill, D., & Brooks, D. (2013). The relationship between athletic identity and physical activity among former college athletes. *Athletic Insight, 5*, 271-284.

- Reifsteck, E., Gill, D., & Labban, J. (2015). “Athletes” and “exercisers”: Understanding identity, motivation, and physical activity participation in former college athletes. *Sport, Exercise, and Performance Psychology*, 1-15.
- Rishe, P. (2003). A reexamination of how athletic success impacts graduation rates: Comparing student-athletes to all other undergraduates. *The American Journal of Economics and Sociology*, 62, 407-427.
- Robst, J., & Keil, J. (2000). The relationship between athletic participation and academic performance: evidence from NCAA Division III. *Applied Economics*, 32, 547-558.
- Rubin, L., & Rosser, V. (2014). Comparing division IA scholarship and non-scholarship student-athletes: A discriminant analysis. *Journal of Issues in Intercollegiate Athletics*, 7, 43-64.
- Santrock, J. (2014). *Life-Span Development* (15th Ed.). New York: McGraw-Hill.
- Schaufeli, W. B., Martinez, I. M., Pinto, A. M., Salanova, M., & Bakker, A. B. (2002). Burnout and engagement in university students a cross-national study. *Journal of cross-cultural psychology*, 33(5), 464-481.
- Schaufeli, W. B., Salanova, M., González-Romá, V., & Bakker, A. B. (2002). The measurement of engagement and burnout: A two sample confirmatory factor analytic approach. *Journal of Happiness studies*, 3(1), 71-92.
- Scott, B., Paskus, T., Miranda, M., Petr, T., & McArdle, J. (2008). In-season vs. out-of-season academic performance of college student-athletes. *Journal of Intercollegiate Sports*, 1, 202-226.
- Shearman, E., Czech, D., Burdette, T., McDaniel, T., Joyner, B., & Zwald, D. (2011). A comparison of optimism levels and life stress levels among NCAA division I athletes and non athletes. *Journal of Issues in Intercollegiate Athletics*, 4, 190-206.

- Singer, J. (2008). Benefits and detriments of African American male athletes' participation in a big-time college football program. *International Review for the Sociology of Sport*, 43, 399-408.
- Smith, B., Hanrahan, S., Anderson, R., & Abbott, L. (2015). Predicting homesickness in residential athletes. *Journal of Clinical Sport Psychology*, 9, 138-155.
- Sorenson, S. C., Romano, R., Azen, S. P., Schroeder, E. T., & Salem, G. J. (2015). Life span exercise among elite intercollegiate student athletes. *Sports health: a multidisciplinary approach*, 7(1), 80-86.
- Thompson, B., & Mazer, J., (2009). College student ratings of student academic support: Frequency, importance, and modes of communication. *Communication Education*, 58, 433-458.
- MGoBlue. (2016). *Academic Success Program*. Retrieved from: <http://www.mgoblue.com/asp/>
- Vallerand, R., & Losier, G. (1999). An integrative analysis of intrinsic and extrinsic motivation in sport. *Journal of Applied Sport Psychology*, 11, 142-169.
- Vansteenkiste, M., Niemiec, C., & Soenens, B. (2010). The development of the five mini-theories of self-determination theory: An historical overview, emerging trends, and future directions. *In The Decade Ahead: Theoretical Perspectives on Motivation and Achievement Advances in Motivation and Achievement*, 16A, 105-165.
- Wahesh, E., Milroy, J.J., Lewis, T.F., Orsini, M.M., & Wyrick, D.L. (2013). Hazardous drinking by first-year college-athletes: The differential roles of drinking motives, alcohol consequences, and season status. *Journal of Alcohol and Drug Education*, 57, 66-84.
- Watt, S. K., & Moore, J. L. (2001). Who are student athletes?. *New directions for student services*, 2001, 7-18.

- Weight, E., Navarro, K., Huffman, L., & Smith-Ryan, A. (2014). Quantifying the psychological benefits of intercollegiate athletics participation. *Journal of Issues in Intercollegiate Athletics*, 7, 390-409.
- Wiese-Bjornstal, D. M., Smith, A. M., Shaffer, S. M., & Morrey, M. A. (1998). An integrated model of response to sport injury: Psychological and sociological dynamics. *Journal of applied sport psychology*, 10(1), 46-69.
- Williams, J., & Andersen, M. (1998). Psychosocial antecedents of sport injury: Review and critique of the stress and injury model. *Journal of Applied Sport Psychology*, 10, 5-25.
- Williams, G., & Deci, E. (1996). Internalization of biopsychosocial values by medical students: A test of self-determination theory. *Journal of Personality and Social Psychology*, 70, 767-779.
- Williams, G., Freedman, Z., & Deci, E. (1998). Supporting autonomy to motivate patients with diabetes for glucose control. *Diabetes Care*, 21, 1644-1651.
- Williams, G., Grow, V., Freedman, Z., Ryan, R., & Deci, E. (1996) Motivational predictors of weight loss and weight- loss maintenance. *Journal of Personality and Social Psychology*, 70, 115-126.
- Wilson, G. S., & Pritchard, M. (2005). Comparing sources of stress in college student athletes and non-athletes. *Athletic Insight*, 7, 1-8.
- Witkowski, S., & Spangenburg, E. (2008). Reduced physical activity and the retired athlete: a dangerous combination? *British Journal of Sports Medicine*, 42, 952-953.
- Wolanin, A., Hong, E., Marks, D., Panchoo, K., & Gross, M. (2016). Prevalence of clinically elevated depressive symptoms in college athletes and differences by gender and sport. *British Journal of Sports Medicine*, 50(3), 167-171.

- Wolverton, B. (2008). Athletes' hours renew debate over college sports. *The Chronicle of Higher Education*, 54.
- Wylleman, P., & Lavallee, D. (2004). A developmental perspective on transitions faced by athletes. In M. Weiss (Ed.), *Developmental Sport and Exercise Psychology: A Lifespan Perspective* (503-523). Morgantown, WV: Fitness Information Technology.
- Yeatts, P., Barton, M., Henson, R., & Martin, S. (2017). The use of structure coefficients to address multicollinearity in sport and exercise science. *Measurement in Physical Education and Exercise Science*, 21, 83 – 91. DOI: 10.1090/1091367X.2016.1259162
- Yusko, D.A., Buckman, J.F., White, H.R., & Pandina, R.J. (2008). Alcohol, tobacco, illicit drugs, and performance enhancers: A comparison of use by college student athletes and nonathletes. *Journal of American College Health*, 57, 281-290.

ABSTRACT**PSYCHOSOCIAL PREDICTORS OF COLLEGE STUDENT ATHLETE BURNOUT
AND ENGAGEMENT**

by

BRIGID BYRD**December 2017****Advisor:** Dr. Jeffrey Martin**Major:** Kinesiology**Degree:** Doctor of Philosophy

Purpose: The purpose of this study was to assess salient psychosocial predictors of both academic and athletic burnout and engagement in college student athletes. **Method:** One-hundred and seventy-nine male and female college student athletes were recruited from a Midwestern University to complete a questionnaire at one time point. **Results:** The prediction model for athlete burnout was statistically significant, $F(4,174) = 16.41, p < .001$, and accounted for approximately 27% of the variance. The prediction model for athlete engagement was also statistically significant, $F(4,174) = 9.25, p \leq .001$, and accounted for approximately 18% of the variance. The prediction model for student burnout was statistically significant, $F(6,172) = 3.79, p < .005$, and accounted for approximately 10% of the variance. The prediction model for student engagement was not statistically significant. **Conclusions:** Athletes who felt misunderstood by their coach, felt their coach did not provide options and choices, and who felt their coach was not confident in their sport ability experienced symptoms of athlete burnout while athletes who felt understood by their coach, felt their coach provided options and choices, and who felt their coach had confidence in their sport ability, believed in their ability to accomplish their sport goals, felt engaged in their sport. Also, athletes who felt their coach was less friendly and supportive if they

were not training and competing well, felt intimidated by their coach, and who felt their coach tried to control their free time and who also felt their teammates did not encourage them to study or did not make sure they got to class had high student burnout. **Application:** Coaches should aim to create an autonomy supportive coaching climate in which athletes feelings of autonomy are enhanced. Exploratory findings also suggest decreasing controlling coaching behaviors and increasing teammate academic social support may be important in thwarting feelings of student burnout in student athletes.

AUTOBIOGRAPHICAL STATEMENT

Professional Record PhD Candidate

BRIGID C. BYRD

September 6, 2017

DEPARTMENT/COLLEGE

Division of Kinesiology, Health, and Sport Studies
College of Education
Wayne State University

PRESENT POSITION:

PhD Candidate

EDUCATION:

Baccalaureate: B.S. Oakland University, MI, 2012

Graduate: Master's Kinesiology Wayne State University, MI 2014

Ph.D. Wayne State University, MI
Dissertation Defense: September 20, 2017

PROFESSIONAL SOCIETY MEMBERSHIP(S):

1. Association for Applied Sport Psychology (AASP)
2. American College of Sports Medicine (ACSM)

AWARDS:

1. 2017 *The Sport Psychologist* Young Researcher Award
 - a. \$1000 sponsored by Human Kinetics

RELEVANT PUBLICATIONS:

1. **Byrd, B.** & Martin, J. (in press). Self-Determination Theory and College Student Athletes. In XX (Ed.): *Self-Determination Theory (SDT): Perspective, Applications, and Impact*. (pp. xx-xx). New York, NY: Nova Science.
2. Martin, J., **Byrd, B.**, Wooster, S., Kulik, N. (2016). Self-Determination theory: The role of the health care professional in promoting well-being. *Journal of Applied Biobehavioral Research*, 21, 1-16.
3. **Byrd, B.** & Martin, J. (2016). The Relationships among Youth Running Programs' Multidimensional Climates and Social Responsibility and Belonging. *Journal of Clinical Sport Psychology*, 10, 19-31.