

THE ROLE OF SPORT PARTICIPATION ON EXERCISE SELF-EFFICACY,
PSYCHOLOGICAL NEED SATISFACTION, AND RESILIENCE

by

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A Dissertation

Submitted in Partial Fulfillment of the Requirements for the
DOCTOR OF PHILOSOPHY IN HEALTH EDUCATION

Department of Public Health and Recreation Professions
in the Graduate School
Southern Illinois University Carbondale
June 2019

DISSERTATION APPROVAL

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A Dissertation Submitted in Partial
Fulfillment of the Requirements
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Doctor of Philosophy in Education
in the field of Health Education

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AN ABSTRACT OF THE DISSERTATION OF

Eric M. Wiedenman, for the Doctor of Philosophy degree in Education in the field of Health Education, presented on **date**, at Southern Illinois University Carbondale.

TITLE: THE ROLE OF SPORT PARTICIPATION ON EXERCISE SELF-EFFICACY, PSYCHOLOGICAL NEED SATISFACTION, AND RESILIENCE

MAJOR PROFESSOR: Dr. Aaron Diehr

To be added.

DEDICATION

To be added.

ACKNOWLEDGMENTS

To be added.

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CHAPTER 1

INTRODUCTION

This introductory chapter provides an overview of the present topic of inquiry: the impact of high school sports participation on future exercise behaviors and resilience of university students in the United States. The following topics will be covered in the present chapter: statement of the problem, need for the study, purpose and significance of the study, significance to health education, theoretical framework, research questions and hypotheses, assumptions, limitations, delimitations, and definition of terms. The subsequent two prospective chapters will provide a comprehensive review of the extant literature guiding the study, as well as a detailed discussion of proposed methods.

Introduction

Even before the birth of the United States, sports have been an integral part of American culture, with World War I serving as the catalyst for introducing sports into the school system (O’Hanlon, 1982; Savage, Bentley, McGovern, & Smiley, 1929). Within schools, sports were not seen solely as recreational opportunities for students, but also as tools that helped develop necessary skills for individuals to contribute to society (O’Hanlon, 1982). The preparedness movement that followed World War I, where Americans recognized the relative weakness of the military and the need to strengthen it (Ward, 1960), further integrated sports into school curricula through the adoption of sports into physical education (P.E.) programs. School administrators believed sports prepared individuals for life, both physically and psychologically, and provided essential personal development for the transition to adulthood (Berryman, 1975; O’Hanlon, 1982). This holistic view of sports as an essential developmental tool for adolescents—combined with its then-presumed benefits to physical and psychological health—has been studied at length,

with researchers largely supporting those school administrators' beliefs one hundred years ago (Dewenter, & Giessing, 2015; Fergus & Zimmerman, 2005; Groff, Lundberg, & Zabriskie, 2009; Hall, 2011; Howie et al., 2010; Machida, Irwin, & Feltz, 2013; Pierce, 2010; Shiina, Brewer, Petitpas, & Cornelius, 2003; Weis, 2007).

As obesity continues to be a global epidemic, health professionals continue to search for effective intervention and prevention programs. As suggested early in the 20th century, sport participation creates an environment not only for one to be physically active at a particular moment, but also one that cultivates and develops skills necessary to lead a physically active lifestyle across the lifespan. Multiple researchers have established that sports participation as a child is one of the strongest predictors of physical activity throughout middle adulthood and beyond (Ball, Bice, & Parry, 2014; Dohle & Wansink, 2013; Smith et al., 2015; Weiss, O'Loughlin, Platt, & Paradise, 2007). This association is likely due to the skill development during sports that collectively mitigate many of the barriers to being physically active as an adult (Beunen et al., 2004; Vanreusel et al., 1997). In this sense, the sports environment appears to be a crucial developmental space for individuals to develop a physically active lifestyle, but its effects extend beyond activity, likely impacting multiple other aspects of health.

For example, physical activity has been identified as a protective factor for mental health (Flegal et al., 2005; USHHS, 2008; Viridis et al., 2009); however, the sports setting provides additional benefits to mental health beyond merely allowing an individual to be physically active. Sports participation's multiple associations with positive mental health (Skirka, 2000) include lower scores of depressive symptoms, lower perceived stress, and higher self-rated mental health (Jewett et al., 2014), as well as overall greater life satisfaction (Gilman, 2001). An

addition to these benefits, the sports environment may directly impact other important psychological components, such as individual self-efficacy and the development of resilience.

The concept of *self-efficacy* refers to an individual's belief in his or her own ability to accomplish a particular task, with self-belief typically task-specific (Bandura, 1986; 1997; Caprara, Alessandri, & Eisenberg, 2012; Pajares, 2002; Pintrich, 1995). As such, sports may improve an individual's self-efficacy to participate in exercise. Self-efficacy's importance for physical activity behaviors is twofold: it is both an outcome of, and an influencing factor for, physical activity participation (McAuley & Blissmer, 2000). More specifically, self-efficacy plays a crucial role in the adoption of and adherence to exercise (Chiu, 2009; McAuley & Blissmer, 2000; Shields, Spink, Chad, & Odnokon, 2010; Tsai & Coleman, 2009). These associations suggest that developing exercise self-efficacy at a younger age may result in greater physically activity later in life. Sports may be the ideal setting for developing exercise self-efficacy due to its support of the four methods of increasing self-efficacy, which include mastery experience, social modeling, verbal persuasion, and improving physiological states (Bandura, 1997). Sports can also develop self-efficacy through the development of resilience in individuals (Simpson et al, 2017).

Adolescent development is often described as one of the most stressful times in an individual's life (American College Health Association [ACHA], 2017; Blanco et al., 2008; Drum, Brownson, Burton Denmark, & Smith, 2009; Piercecall & Keim, 2007). Therefore, it follows that adolescents who are able to develop the necessary coping skills and mechanisms to deal with the influx of associated stress hold greater likelihood of having better lifespan health outcomes. The sports setting provides a unique environment for individuals to learn to cope with difficult situations. The abilities to achieve positive outcomes in the face of challenge, develop

and hone coping skills, and avoid negative outcomes are all components of resilience (Alvord & Grados, 2005; Brooks, 2006; Luthar, Cicchetti & Becker, 2000). Fergus and Zimmerman (2005) identified four models of resilience, each touching on the unique components of the sports setting and thus suggesting sports may be the ideal setting for the development of resilience. As the sports setting works to develop components like self-concept (Werner, 1986), self-regulation (Alvord & Grados, 2005; Benzies & Mychasiuk, 2009), and positive relationships with teammates and coaches (Zolkoski & Bullock, 2012), each skill works in turn to develop overall individual resilience.

Through multiple pathways, the sports environment holds great potential to impact individual health positively, both physically and psychologically. Further, these benefits may continue throughout the course of individuals' lifespans, encouraging them to lead physically active and healthy lifestyles.

Statement of the Problem

United States obesity rates have tripled since 1980, and, globally, obesity represents one of the greatest risks to population health (Dietz, 2015; Ogden, Carroll, & Flegal, 2014, Ogden, Carroll, Kit, & Flegal, 2014). Physical inactivity, a prominent risk factor for obesity, is associated with increased risk for heart disease, diabetes, osteoporosis, and cancer, as well as loss of muscle mass and increased probability of injuries (Flaghouse Inc., 2010; Flegal et al., 2005; Howard & Gillis, 2009; Sherry, Blanck, Galuska, Pan, & Dietz, 2010; Sithole & Veugelers, 2008; Stalmatakis & Weiler, 2010; Wearing, Hennig, Byrne, Steele, & Hills, 2006). Researchers have suggested that if current trends in physical inactivity and diet continue, more than 44% of adults will be considered obese by body mass index (BMI) by 2030 (Finkelstein et al., 2012). This prediction stems from the health of our youth, with approximately one-third of school-aged

children classified as overweight or obese in the US as of 2016 (National Kids Count, n.d.; National Research Council, 2012; Sahoo et al., 2015).

Adolescence—defined as the developmental period between the ages of 10 and 18 (Hoff, Briley, Wee, & Rounds, 2018)—is marked by increased independence and stimuli, resulting in increased levels of stress and decreasing levels of physical activity (PA) (ACHA, 2017; Flaghouse Inc., 2010; Flegal, Graubard, Williamson, & Gail, 2005; Haskell et al., 2007; Pierceall & Keim, 2007). This developmental stage is crucial for children to develop an understanding of self and establish habits sustainable across a lifetime (Arnett, 2000; Dinger & Vesely, 2001; Jackson, Tucker, & Herman, 2007; Parker, Summerfeldt, Hogan, & Majeski, 2004). It also marks a common period in which the onset of mental health disorders is greater, further complicating how adolescents might choose to—or otherwise experience difficulty—establish health-promoting behaviors. Over fifty percent of anxiety, mood, and substance use disorders present symptoms in individuals prior to age 15 (Cohen et al., 1993; Kim-Cohen et al., 2003; Lewinsohn, Hops, Roberts, Seeley, & Andrews, 1993; McGee, Feehan, Williams, & Anderson, 1992; Merikangas et al., 2010). Yet only about half of children and adolescents with severe mental health disorders seek treatment (Merikangas et al., 2010; Merikangas et al., 2011). Even for those who seek treatment, these disorders often continue throughout adolescence and into young adulthood.

For university students, the diagnosis of mental health problems has become increasingly prevalent (ACHA, 2017; Blanco et al., 2008; Drum, Brownson, Burton Denmark, & Smith, 2009), with the ACHA National College Health Assessment (NCHA) reporting in 2017 that 67.3 percent of students felt very sad at some time in the last 12 months and that another 39.1 percent reported feeling so depressed that they found it difficult to function. Anxiety frequently coexists

with these depressive symptoms (Olfson et al., 2000; Schonfeld et al., 1997), potentially causing even greater disability for individuals (Alonso et al., 2004; Andrews, Henderson, & Hall, 2002; Olfson et al., 1997). Furthermore, anxiety and depression are both risk factors for suicide (Weber, Michail, Thompson, & Fiedorowicz, 2017), the second leading cause of death for college students (Turner, Leno, & Keller, 2013). Thus, young adults represent a priority population when considering both current and future health outcomes; however, university students are nonetheless surrounded by structured, educational environments capable of positively impacting their knowledge, attitudes, and behavior towards health behavior.

Sports can provide individuals with an ideal environment to cultivate the psychological constructs of resilience and self-efficacy, traits that can provide them with protective agents that support physical and mental health, thus promoting greater life satisfaction (Fergus & Zimmerman, 2005; Hall, 2011). However, for many adolescents, after high school, the availability of sports participation can be limited and/or non-existent. As of 2016, over 52% of high school students participated in school-sponsored sports programs (National Center for Education Statistics, 2016; National Federation of State High School Associations [NFSHSA], 2016), but only 2.74% of high school athletes had the opportunity to compete in junior college, National Association of Intercollegiate Athletics (NAIA), or National Collegiate Athletic Association (NCAA) sanctioned athletics (NAIA, n.d.; NCAA, 2018; NFSHSA, 2017; National Junior College Athletic Association [NJCAA], n.d.). Therefore, establishing healthy habits during adolescence, specifically within the school setting, may help to improve physical activity levels into adulthood.

Need for the Study

By 2030, over forty four percent of adults in the US will be obese (Finkelstein et al., 2012). In 2014, the lifetime costs of childhood obesity, as calculated based on the number of obese 10-year-olds, directly accounted for approximately \$14 billion in medical costs. While this amount in and of itself is startling, that particular study's authors noted that lifetime costs related to obesity for adults are consistently greater than for children (Finkelstein et al., 2014). Obesity, therefore, represents not only a national health crisis, but a legitimate future economic crisis.

Healthy People 2020 has identified physical activity, mental health and mental disorders, and adolescent health as priority health topic areas, with physical activity and mental health and mental disorders being topic areas that date back to Healthy People 2000 (CDC, 2019). Yet, the need to study these issues remains critical, and perhaps it is even more important to examine those innovative approaches that might succeed where previous programs have failed to produce positive impact. The sports setting has consistently demonstrated an ability to display effectiveness on physical activity levels among participants across both short- and long-term. However, there has been some evidence that sports may also impact individual self-efficacy and resilience. Therefore, this study is necessary in identifying effective intervention programs aimed at combatting obesity, and programs that cultivate important life skills, such as intrinsic motivation, self-efficacy, and resilience.

Purpose of the Study

Accordingly, the purpose of this study is to evaluate the relationship between high school sport participation among university students and whether that previous sports participation correlates with current levels of exercise-self efficacy, resilience, psychological need satisfaction in sport, and current physical activity behaviors.

Significance of the Study

Establishing effective and efficient ways to address obesity among youth is increasingly important, given that obesity and physical activity behaviors in adolescence are correlated strongly with adult obesity (US Department of Health and Human Services, 2014). The school setting provides a promising environment to effect change for youth, with its ability to impact knowledge, behaviors, and environmental factors associated with obesity (Robinson, Berg, & Gleddie, 2018; Scherr et al., 2017; Wang et al., 2015). Within the school setting, sports participation represents an intervention that provides participants with opportunities to partake in activities that can enhance overall health and combat obesity. Additionally, sport provides the opportunity to learn and reinforce skills that can be used to promote and adhere to healthy behaviors such as lifelong physical activity.

Moreover, high school sport participation provides venues through which individuals can increase self-efficacy through practice of a skill or technique, as well as via their interactions with coaches and peers (Glanz, Rimer & Viswanath, 2008). Sports participation cultivates resilience through many of the same avenues as self-efficacy (Machida, Irwin, & Feltz, 2013). Therefore, in addition to providing regular physical activity, high school sport participation may have a positive influence on an individual's self-efficacy and resilience. Individuals with high levels of self-efficacy and resilience may continue participating in physical activity behaviors long beyond the structured environment of high school sports, thereby avoiding the negative health risks associated with the transition to college, some of which include decreased physical activity and increased emotional and psychological stress (Bray & Born, 2004; Gall, Evans, & Bellerose, 2000).

Researchers have emphasized that the transitional period to young adulthood is one of the most stressful times in one's life, with the challenges of university life compounding that stress (Gallagher, 2008; Grace, 1997; Hales, 2009; Hudd et al., 2000; Mackenzie et al., 2011). This added stress can have significant negative impacts on physical and mental health (Benton, Robertson, Tseng, Newton, & Benton, 2003; Dyson & Renk, 2006; Economos, Hildebrandt, & Hyatt, 2008; Kessler & Walters, 1998; Pritchard, Wilson, & Yamnitz, 2007; Weitzman, 2004; Yorgason, Lonville, & Zitzman, 2008), with mental health problems becoming increasingly common among university students (ACHA, 2017; Blanco et al., 2008; Drum, Brownson, Burton Denmark, & Smith, 2009). Therefore, identifying components that can develop the skills necessary to maintain a physically active lifestyle and the environments where these skills are most supported is crucial to preventing obesity and other poor health outcomes in adults.

Significance to Health Education

Understanding how motivation for physical activity is developed in adolescents and college students can open new possibilities in intervention strategies that inform how youth are educated. Designing physical activity environments that teach and cultivate the psychological foundations of motivation can work to reinforce those skills, resulting in greater motivation for physical activity. As individuals become more competent in their respective environments, they begin to feel more comfortable and able to interact effectively within their parameters. Developing autonomy towards physical activity helps instill individual responsibility for physical health and the belief that health can be positively impacted. Relatedness gives individuals a sense of connectedness and similarity with others, which can similarly encourage participation in activities and environments that might have been otherwise insignificant or uninteresting to the individual. Through the development of these constructs, individuals can

develop personal motivation and enjoyment in physical activity and thus cultivate resilience and self-efficacy toward lifelong exercise.

High-school-sponsored sports often provide environments in which some of the psychological constructs comprising motivation can be developed. The progressive teaching of complex skills, interactions with adults and peers, and personal responsibility are all important components of sports—the combination of which might contribute to the development of personal motivation. As students move beyond high school and into colleges or universities, these same components can be implemented into existing physical activity programs, such as physical education classes, exercise and fitness classes, and college introductory courses. Through the addition of these components, these new environments can more effectively develop the constructs crucial to motivation for physical activity, resulting in individuals who grow to be personally motivated to be physically active throughout life.

Theoretical Framework

The self-determination theory (SDT) was developed to help explain motivations underlying individual behavior and has been used extensively to examine what intrinsic and extrinsic factors influence individuals' decisions to participate in physical activity (Deci & Ryan, 1985; 2000; Frederick-Recascino, 2002). The SDT posits that the psychological foundation upon which motives develop in individuals is the product of the psychological needs of competence, autonomy, and relatedness (Deci & Ryan, 1985; 2000). Participation in physical activity is closely linked with experiences with the three psychological needs that comprise the SDT (Bice, Ball, Parry, & Adkins, 2016). The SDT seeks to understand how these constructs influence individual motivation towards behavior and how they can be strengthened via participation in a particular behavior, thus leading to a greater levels of individual motivation to continue engaging

in that behavior. The present study posits that high school sport participation may cultivate the aforementioned psychological constructs of the SDT, promoting individuals to continue physical activity beyond high school.

The SDT may also help to explain the cultivation of resilience and self-efficacy in the sports environment. For example, researchers have established that resilience consists of five attributes, with social competence, autonomy, and a sense of purpose all directly linked to the SDT (Zolkoski & Bullock, 2012). Further, individual self-efficacy toward a task implies a level of competence and autonomy both within a specific environment and with respect to the task itself (Bandura, 1997). Therefore, the SDT acts as a strong theoretical foundation for exploring the research questions associated with the present study.

Research Questions

The following research questions will guide the methods of the present study (see Chapter 3 for detailed methodological discussion).

1. Does self-efficacy among college freshmen differ by previous participation in high school sports?
2. Does resilience among college freshmen differ by previous participation in high school sports?
3. Do current exercise behaviors among college freshmen differ by previous participation in high school sports?
4. What demographic characteristics are associated with higher exercise self-efficacy among college freshmen?
5. What demographic characteristics are associated with higher resilience among college freshmen?

6. What influence does previous participation in high school sports have on psychological need satisfaction in exercise (PNSE) scores among college freshmen?
7. What demographic characteristics are associated with higher psychological need satisfaction in exercise (PNSE) scores among college freshmen?

Assumptions

The research team acknowledges several assumptions in the design and procedures of the proposed study. First, though the proposed instruments for the present study have been validated across multiple populations across the years (see Chapter 3), we must nonetheless assume they continue to measure what they purport to measure. Second, the primary investigator assumes survey questions will be understood by respondents and that they will provide honest and accurate responses. Finally, the proposed sampling method has been chosen for its likelihood of yielding a normally-distributed and representative sample of college freshmen in the United States (see Chapter 3).

Limitations

As with all cross-sectional studies, any potential findings must be analyzed and discussed with the understanding of specific limitations. Using college freshmen students to self-report information relating to their high school experience may allow for potential inaccuracy in reporting due to recall bias. Limiting participating universities to public, four-year institutions prevents a significant swath of college freshmen from participating in the survey. Furthermore, other variables not measured in this study may hold influence in individuals' exercise self-efficacy, motivation, and/or resilience, thus impacting the effect of any resultant findings. Lastly, the level of high school sport competition and quality can vary from individual to individual, possibly allowing for some skewness.

Delimitations

Delimitations are those parameters set in the design of this study. College freshmen were selected as the sample population to reduce any potential recall bias regarding impacts of high school sport participation on the variables of interest in the study. The sampling method of dividing the United States into distinct geographical regions was chosen purposively to present a more representative sample of college freshman. Lastly, asking solely about high school sport participation and not non-affiliated club sports allows the research team to control for potential variability in competition level as well as coaching quality.

Definition of Terms

Adolescence. The developmental age range between 10 and 18 years old (Hoff, Briley, Wee, & Rounds, 2018).

Autonomy. The free agency of behavior choice believed to come from an internal, intrinsic source (Decharms, 1968).

Competence. The interaction individuals have with their environment and their ability to master challenging tasks and skills within that environment (White, 1959).

Exercise. Physical activity that is planned, structured, repetitive, and purposive, with its intended outcome to improve or maintain elements of physical fitness (Caspersen et al., 1985).

Individual sport. A collection of individuals connected together in an activity where individuals perform separate of each other and their subsequent performances impact team standing (Merriam-Webster, 2018).

Obesity. A body weight that is higher than what is considered a healthy weight. Using body mass index (BMI), obesity is defined as a value of 30 or greater (CDC, 2016a; 2016b).

Overweight. A body weight greater than a healthy weight, defined as BMI value between 25.0 and 29.9 (CDC, 2016a; 2016b).

Physical activity. Bodily movement produced by the skeletal muscles that requires energy expenditure and provides numerous benefits to an individual's physical health (WHO, 2011).

Relatedness. The need to belong and the ability to make meaningful connections within an individual's social environment (Baumeister & Leary, 1995).

Resilience. An individual's ability to achieve positive outcomes in the face of challenge, the possession of coping skills for traumatic experiences, and the avoidance of negative outcomes associated with risks (Alvord & Grados, 2005; Brooks, 2006; Luthar, Cicchetti & Becker, 2000).

Self-efficacy. The belief in one's capabilities to complete an action that produces a desired result (Bandura, 1997).

Sport(s). A collection of individuals connected together in an activity (Merriam-Webster, 2018).

Stress. The process that occurs when an event has the potential to impact an individual's well-being, sometimes—but not always—harmfully (Lazarus & Folkman, 1984).

Team sport. A collection of individuals connected together involving a reliance on all other players to work together equally to accomplish tasks related to the sport (Baofu, 2013).

Summary

This chapter provided an introduction to the current study that seeks to evaluate the impact of high school sport participation on various factors among college freshmen in the United States. Within the context of this chapter, the following sections were introduced: the problem of interest, the need for the current study, research questions, theoretical framework, assumptions, limitations, delimitations, and a definition of terms relevant to the study.

CHAPTER 2

LITERATURE REVIEW

Introduction

Rising obesity rates, both globally and within the United States, represents one of the greatest risks to population health (Dietz, 2015). While obesity is a complex issue impacted by many factors (Davison & Birch, 2001; Seyednasrollah et al., 2017), researchers suggest if current trends in physical inactivity and diet continue, more than 44% of adults will be considered obese by 2030 (Finkelstein et al., 2012). This troubling statistic has resulted in the United States declaring obesity an epidemic, as overall rates have tripled since 1980 (Ogden, Carroll, & Flegal, 2014, Ogden, Carroll, Kit, & Flegal, 2014).

Childhood obesity has become a primary public health concern, and approximately one-third of school-aged children are classified as overweight or obese in the United States as of 2016 (National Kids Count, n.d.; National Research Council, 2012; Sahoo et al., 2015). Establishing effective and efficient ways to address obesity among youth is increasingly important, given that obesity and physical activity behaviors in adolescence are associated with obesity in adulthood (US Department of Health and Human Services, 2014). For youth, the school—with its ability to impact education, behavior, and environmental factors associated with obesity—provides a promising environment to effect change (Robinson, Berg, & Gleddie, 2018; Scherr et al., 2017; Wang et al., 2015). The unique interactions of factors within a school provide an ideal environment to promote healthy behaviors such as being physically active; however, as of 2013, only 27.1 percent of high school students are considered physically active (Johnson, Hayes, Brown, Hoo, & Ethier, 2014).

One intervention that yields varying direct and indirect impact on obesity is sports participation. Not only do sports provide participants opportunity to partake in activities that can enhance overall health, they also provide a route to combat obesity. Additionally, they can establish a unique environment that challenges individuals and indirectly solidifies physical and psychological skills transferrable to other sports or activities of daily living. Sports provide the opportunity to learn and reinforce skills that can be used to promote and adhere to healthy behaviors such as lifelong physical activity.

Adolescence is a term used to describe an age range between 10 and 18 (Hoff, Briley, Wee, & Rounds, 2018). Throughout these years, individuals are exposed to multiple internal and external stimuli, resulting in increased levels of stress and decreasing levels of physical activity (PA) (American College Health Association [ACHA], 2017; Flaghouse Inc., 2010; Flegal, Graubard, Williamson, & Gail, 2005; Haskell et al., 2007; Pierceall & Keim, 2007). These stimuli can influence a combination of consequences negatively impacting physical, psychological, and social health. As adolescents transition into adulthood, they are presented with new or heightened stressors that create more barriers to being physically active. However, this transition into adulthood also signifies a unique developmental stage for adolescents. During this time, they begin to understand their sense of self, how they fit in with society, and how to create habits sustainable throughout their lifetime (Arnett, 2000; Dinger & Vesely, 2001; Parker, Summerfeldt, Hogan, & Majeski, 2004). Therefore, activities that promote positive development during this stage may help to equip individuals with valuable skills and resources necessary to combat new and more frequent stressors.

Adolescents participating in sports are equipped with tools to live healthier lives, create strong social connections, and excel in their future careers (Dewenter, & Giessing, 2015; Groff,

Lundberg, & Zabriskie, 2009; Howie et al., 2010). Sports can provide an individual with the ideal environment to cultivate the psychological constructs of resilience and self-efficacy, traits that can provide individuals with protective agents supporting physical and mental health and greater life satisfaction (Fergus & Zimmerman, 2005; Hall, 2011). However, after high school, the availability of sports participation can be limited and/or non-existent. Over 52% of high school students participate in school-sponsored sports programs (National Center for Education Statistics, 2016; National Federation of State High School Associations, 2016), but only 2.74% of high school athletes have the opportunity to compete in junior college, National Association of Intercollegiate Athletics (NAIA), or National Collegiate Athletic Association (NCAA) sanctioned athletics (NAIA, n.d.; NCAA, 2018; NFSHSA, 2017; NJCAA, n.d.).

University students typically represent individuals in transition from adolescence to early adulthood, and many attended high schools that offered school-sponsored sports. Accordingly, the purpose of this study is to evaluate the relationship between high school sports participation and current resilience, self-efficacy, and physical activity motivation levels among college students. The following literature review will document recent and marquee studies outlining college health, sports participation, the connection between sports participation and health, self-efficacy, and resilience.

University Health

Approximately 20.4 million students are enrolled in colleges and universities in the United States as of 2017, representing about one third of the young adult population (U.S. Department of Education, 2017). Students entering the university setting presumably have existing skills and behaviors acquired during adolescence but also the ability to acquire new ones. Students are often living on their own for the first time, taking greater control over their

behaviors, and exploring their new-found independence (Parker, Summerfeldt, Hogan, & Majeski, 2004). This transition to independence can have a profound effect on the adaptation and maintenance of health behaviors into adulthood (Arnett, 2000; Dinger & Vesely, 2001). Deficiencies in skills and behaviors that promote health can potentially put university students at a disadvantage. More importantly, the consequences of neglected health behaviors have long-term effects (Centers for Disease Control and Prevention [CDC], 2009; Gordon-Larsen, Nelson, & Popkin, 2004). New roles and responsibilities for college students contribute to a variety of health issues that can be detrimental to overall health, including physical inactivity, psychological well-being, mental health, & stress.

One main factor influencing university students' health behaviors is the increase in stress. Hales (2009) argued that this transitional period is one of the most stressful times in an individual's life, with new academic and social challenges increasing the prevalence of stress for university students (Gallagher, 2008; Grace, 1997; Hudd et al., 2000; Mackenzie et al., 2011). Stress has a significant negative impact on overall health behaviors (Economo, Hildebrandt, & Hyatt, 2008; Pritchard, Wilson, & Yamnitz, 2007) as well as mental health status when an individual is not able to cope effectively (Benton, Robertson, Tseng, Newton, & Benton, 2003; Dyson & Renk, 2006; Kessler & Walters, 1998; Weitzman, 2004; Yorgason, Lonville, & Zitzman, 2008). In fact, mental health problems have become increasingly prevalent among university students (ACHA, 2017; Blanco et al., 2008; Drum, Brownson, Burton Denmark, & Smith, 2009).

Along with added stress and its effect on mental health, researchers have suggested individuals also exhibit a substantial decrease in physical activity levels during this time in their lives (Butler, Black, Blue, & Gretebeck, 2004; Nelson, Gortmaker, Subramanian, & Wechsler,

2007; Nelson, Neumark-Stzainer, Hannan, Sirard, & Story, 2006; Sallis, Alcaraz, McKenzie, & Hovell, 1999; Troiano et al., 2008). This trend in physical activity levels represents a significant health risk, as physical inactivity affects poor health comparable to smoking or obesity (Lee et al., 2012).

Physical inactivity. Physical inactivity is a crucial contributing factor to obesity trends in all age groups (Anderson, Hughes, & Fuemmeler, 2009; Zettle-Watson & Britton, 2008). As a result, the World Health Organization (WHO) has identified increasing physical activity levels as a top priority in the health of all individuals (Suggs, McIntyre, & Cowdery, 2010). Physical inactivity is associated with increased risk for heart disease, diabetes, osteoporosis, and cancer, as well as loss of muscle mass and increased probability of injuries (Flaghouse Inc., 2010; Flegal et al., 2005; Howard & Gillis, 2009; Sherry, Blanck, Galuska, Pan, & Dietz, 2010; Sithole & Veugelers, 2008; Stalmatakis & Weiler, 2010; Wearing, Hennig, Byrne, Steele, & Hills, 2006). Age is a risk factor for diseases, and as individuals age, they become less active (Flaghouse Inc., 2010; Flegal, Graubard, Williamson, & Gail, 2005; Haskell et al., 2007). Therefore, older individuals are already at a higher risk for disease, and lack of physical activity simply increases their risk.

Engaging adults in physical activity can help negate some of the disease risk factors associated with aging; however, by the time individuals have reached adulthood, many of their daily habits and routines have been firmly established. Because habit formation related to physical activity has been linked to increased lifelong exercise behaviors (Dishman & Buckworth, 1996), interventions focusing on adolescence, when individuals are beginning to form habits (Jackson, Tucker, & Herman, 2007), seem to be the most promising in improving physical activity. Indeed, evidence shows higher childhood levels of physical activity to be

linked with greater adult physical activity participation (Barnekow-Bergkvist, Hedberg, Janlert, & Jansson, 2001; Kjonniksen, Torsheim, & Wold, 2008). Finding effective ways to engage children and adolescents in physical activity may help to establish habits that will persist into adulthood, thereby improving individuals' overall health.

Psychological Wellbeing

One in three individuals worldwide will be affected by one or more mental health disorder (Kessler et al., 2007); however, only a small number of individuals receive help for their mental health issues (Alonso et al., 2004b; Bijl et al., 2003). Of those who receive help, the financial and physical impact is profound. For instance, in 2002, mental health issues accounted for an estimated \$317 billion in total expenditures and were found to reduce life expectancy by up to 32 years (National Institute of Mental Health, 2013a, 2013b). These numbers, while startling, only show a fraction of the impact poor mental health has on society.

Mental health. Mental health has been defined by the World Health Organization (WHO, 2005) as “a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to contribute to his or her community” (p. 2). Additionally, one must achieve a combination of emotional, psychological, and social well-being to be healthy mentally (Keyes, 2002). Mental health, then, is more than simply the absence of mental illness, as it is fundamental to quality of life and physical health (Herrman, Saxena, Moodie, & WHO, 2005).

Although mental health is important at all stages of life, the onset of mental health issues often is in childhood and adolescence. Broadly, data on mental health in children and adults mirror each other, with about one in every three to four children suffering from a mental health disorder (Brauner & Stephens, 2006; Costello, Egger, & Angold, 2005; Merikangas et al., 2010).

National data report the general adolescent population has a prevalence rate of 31.9% for anxiety disorders, 19.1% for behavioral disorders, and 14.3% for mood disorders (Merikangas et al., 2010). These disorders present themselves in individuals at a young age; 50% who suffer from anxiety, mood, and substance use disorders presented with symptoms by age 6, 13, and 15 respectively. (Cohen et al., 1993; Kim-Cohen et al., 2003; Lewinsohn, Hops, Roberts, Seeley, & Andrews 1993; McGee, Feehan, Williams, & Anderson, 1992; Merikangas et al., 2010). However, only about one half of children and adolescents with severe mental health disorders seek treatment (Merikangas et al., 2010; Merikangas et al., 2011). Two of the most diagnosed disorders associated with mental health are depression and anxiety.

Depression. A universal major health concern, depression is among the leading contributors to the global burden of disease and disability (Moussavi et al., 2007; World Health Organization, 2008; World Health Organization, 2012). In the United States alone, more than 19 million adults suffer from a depressive illness each year, with total costs associated with the disorder estimated at over \$30 billion (Mathers, Lopez, & Murray, 2006). Kessler and colleagues (2005) estimate a lifetime prevalence rate for major depression to be 16.6%, meaning that nearly one in five individuals suffers from depression in his or her life. This mood disorder is influenced by a variety of both intrinsic and extrinsic factors that affect an individual's thought patterns, behavior, and overall well-being (American Psychiatric Association, 2013; Langner & Michael, 1963; Salmans, 1997).

Depressive symptoms impact all aspects of an individual's health and wellness, affecting both psychological and physical functionality (American Psychiatric Association, 2013). Specifically, depression has been linked with decreased functioning in social relationships (Davila, Karney, Hall, & Bradbury, 2003; Wade & Pevalin, 2004), in the workplace (Adler et al.,

2006; Kessler et al., 2006), and in the overall health domain (Räikkönen, Matthews, & Kuller, 2007; Wulsin & Singal, 2003). Additionally, depression has been associated with increased rates of suicidal behavior (Berman, 2009; Harris & Barraclough, 1997) and is often chronic among individuals with the disorder (Kessler et al., 2003; Solomon et al., 2000). Specific to college settings, students with depression are more likely to miss classes, assignments, and tests when compared to their non-depressed counterparts (Hysenbegasi, Hass, & Rowland, 2005), and depression is associated with overall decreased academic performance (Hysenbegasi et al, 2005; Keyes et al., 2012).

The American College Health Association (ACHA) National College Health Assessment (NCHA) reports 67.3 percent of students felt very sad any time in the last 12 months, and 39.1 percent of students reported feeling so depressed that it was difficult to function (ACHA, 2017). This report highlights the impact mental health and depression has among college students and how prevalent mental health issues are. Individuals with depressive symptoms often suffer from anxiety as well, with both disorders frequently coexisting (Olfson et al., 2000; Schonfeld et al., 1997). Together, these two disorders can cause even greater disability for the individual (Alonso et al., 2004a; Andrews, Henderson, & Hall, 2002; Olfson et al., 1997).

Anxiety. Anxiety can be defined as a state of over-arousal (Malmö, 1957) or an uneasiness about the potential occurrence of a negative event (Roseman, Antoniou, & Jose, 1996), and it is characterized by the expectation of a future threat over which an individual does not have control (Barlow, 2002). Anxiety is a natural response for individuals; however, when that response is prolonged and disproportionate to the perceived threat and when an individual feels unable to cope, it is then referred to as neurotic or clinical anxiety (Iacovou, 2011; May, 1977).

The prevalence of anxiety in the United States is significant, with a study conducted by the Anxiety and Depression Association of America (n.d.) reporting that seven out of 10 adults experience anxiety or stress at least at a moderate level. Additionally, anxiety is the most commonly reported mental health disorder among college students, with over 60 percent reporting feelings of overwhelming anxiety at least once in the last 12 months (ACHA, 2017). Taken together with the data on depression among college students, overall mental health is a critical concern for the college student population. Additionally, anxiety and depression are both risk factors for suicide (Weber, Michail, Thompson, & Fiedorowicz, 2017), the second leading cause of death for college students (Turner, Leno, & Keller, 2013). However, physical activity has proven to be an effective intervention in treating anxiety and depressive symptoms, with exercise mirroring the effects of more clinical interventions (Fox, 1999). Exercise can also serve as a protective factor against developing depression and anxiety, highlighting the importance for regular physical activity beginning in adolescence (Fox, 1999; Paluska & Schwenk, 2000).

Stress

Stress is another factor that greatly impacts student health. Stress can be defined as the process that occurs when an event has the potential to impact an individual's well-being, sometimes harmfully (Lazarus & Folkman, 1984). Additionally, stress requires physical, psychological, or behavioral inputs from the individual to manage both the event and potential outcomes (Lazarus & Folkman, 1984). These events are commonly referred to as stressors (Mason, 1975) and have the potential for both positive and negative outcomes, depending on the specific stressor and individual (Lazarus & Folkman, 1984). However, it is not the specific stressor itself that determines if an event is stressful, but it is instead how the individual

perceives or evaluates the event (Mason, 1972) in concert with the physical health of the individual (McEwen, 1998).

Stress can occur at any time in daily life, impacted by specific situations or events. These events may not be inherently stressful, but an individual's perception and appraisal of the events determines the level to which they feel stressed by them. Stress is not universally interpreted, making it difficult to predetermine how an individual will respond to the stressor (Renn Upchurch Sweeney, 2013). Therefore, an individual's perception of the stressor determines its potential for positive or negative outcomes.

Distress. When individuals view a stressor as undesirable or harmful in some way, the reaction is described as *distress* (Helman, 2007). Often, distress is associated with stressors that persist over an extended period of time, may be particularly intense, or continually repeat themselves, causing an individual to be unable to cope (Dowell, Hamilton, & McLeod, 2000). These stressors, then, result in negative physical and psychological outcomes (Selye, 1976) that occur when an individual's stress response exceeds his or her ability to cope (Clancy & McVicar, 2002).

Towbes and Cohen (1996) report that the transition from adolescence to adulthood, during which time many individuals attend college/university, increases individuals' vulnerability to distress (Pierceall & Keim, 2007). The NCHA reported that 45.1% of students experienced more than average stress in the last year, compared to 34.6% who reported average stress. In addition, 12.0% of students reported tremendous stress, and a combined 8.3% of students reported less than average or no stress (ACHA, 2017). These findings continue to support the notion that the transition to, and continuation of, college marks a very stressful event

for students. Stress affects myriad aspects of an individual's life and holds the potential to impact greatly an individual's functioning and interactions with the world.

Physiological effects. The human body is designed to survive. When a stressor is presented, the human body undergoes physiological changes to allow the individual to cope and maintain homeostasis. This autonomic response, commonly referred to as the “fight or flight” response, is two-sided: it can provide protection to the body during a stressful event, but it also can cause considerable damage (Selye, 1936). As individuals come into contact with a stressor, the stress response prepares the body for action. This preparation is achieved via a number of physiological changes. The body increases both heart and respiration rate, allowing more oxygen to be readily available to the skeletal muscles and to accelerate the expulsion of carbon dioxide. Blood is pulled from the skin, digestive tract, kidneys, and liver to assist in the transport of oxygen to the muscles. Skeletal muscles tense up, ready to activate at a moment's notice. Stored energy in the body is released into the bloodstream by the hormone cortisol, making it readily available to the skeletal muscles (Thygeson, 2018). These actions prepare and protect the body from the potential stressor. However, the physiological response to stress is fundamentally the same regardless of the stressor (Cohen & Hamrick, 2003). When these stressors persist for a prolonged period—a situation defined as *chronic stress*—the response begins to become detrimental.

As the response to stress persists, the once-beneficial changes become problematic. Increased heart and respiration rates can lead to general fatigue, chest pains, and sleep problems. Blood being diverted to the skeletal muscles causes increased likelihood of gastrointestinal issues. Cortisol causes the release of stored energy in the body, eliciting the hunger response (Sapolsky, 2004). This release, coupled with the energy not being used by muscles, often leads to

weight gain (Mayo Clinic, 2016). These physiological changes can have a profound impact on the overall physical health of college students (Brougham, Zail, Mendoza, & Miller, 2009). College students who report higher levels of stress are less likely to exercise and get adequate sleep, and they are more likely to consume unhealthy food options (Hudd et al., 2000). The inability to cope with stress often results in students engaging in poor health behaviors, such as alcohol abuse, smoking, eating disorders, and decreased physical activity (Economos, Hildebrandt, & Hyatt, 2008; Oliver, Reed, & Smith, 1998; Pritchard, Wilson, & Yamnitz, 2007; Stults-Kolehmainen & Sinha, 2014). While the stress response is physiological in nature, the effects reach beyond physical health and play an important role in the psychological health of college/university students as well.

Psychological effects. The effect of stress on psychological health is well documented, with stress levels having been shown to predict psychological distress (Cassidy, O'Connor, Howe, & Warden, 2004; Chang, 2001; O'Connor, Cobb, & O'Connor, 2003). Many psychological disorders present symptoms during late adolescence and early adulthood, potentially impacting the well-being of college students already experiencing elevated levels of stress. (Dyrbye, Thomas, & Shanafelt, 2006; Stoeber & Rambow, 2007). Indeed, high levels of stress among college students have been consistently linked with poor mental health status overall, but it has also been associated specifically with depression, anxiety, and suicidal behavior (Bardeen, Fergus, & Orcutt, 2013; Hirsch, Chang, & Jeglic, 2012). As stress levels often increase in individuals while at college or university (Hales, 2009), they may experience decreased cognitive functioning and learning (Dahlin, Joneborg, & Runeson, 2005), directly interfering with their ability to succeed. This inability to learn and function effectively in courses may, in turn, cause additional stress, thus creating a cycle. Learning ways to cope with stress

effectively can help individuals break this cycle, thus providing benefits to overall health. An individual's psychological response to stress has a direct influence on his or her bodily response to stress and is predictive of overall well-being (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001; Lazarus & Folkman, 1984). These responses are often observable by other students and peers, impacting how individuals are viewed socially.

Social effects. The transition to college introduces individuals to a new host of potential stressors, with researchers indicating relationships as one of the most stressful (Hurst, Baranik, & Daniel, 2013; Seiffge-Krenke, Weidmann, Fenter, Aegenheister, & Poebblau, 2001; Williamson et al., 2003). Alternatively, social support is strongly linked to positive health outcomes (Clarke, 2006; Compas et al., 2001) and its use is a popular coping strategy to combat stress in adolescence (Zimmer-Gembeck & Skinner, 2011). Social media websites, such as Facebook, have begun to replace more traditional means of social interaction, and adolescents have identified these sites as means of social support (Coiro, Bettis, & Compas, 2017; Papacharissi & Mendelson, 2011). However, Coiro et al. (2017) found that adolescents seeking support through Facebook developed depressive symptoms, possibly suggesting that face-to-face interpersonal relationships provide a better social support system and emphasizing the importance of developing face-to-face social skills.

Additionally, important existing social support networks have the potential to disintegrate upon the added independence of college (Weckwerth & Flynn, 2006), leaving individuals forced to create new ones as quickly as possible into their college experience. This loss of existing social support and the need to establish new support may induce stress in students, compounding existing stressors. College students' ability to maneuver through these stressors, while cultivating a social support network, may drastically alter their ability to cope with the stress of college life.

Intrapersonal effects. The intrapersonal effects of stress both influence and are influenced by psychological health. Whereas psychological health involves clinical diagnoses, intrapersonal health focuses on an individual's perceptions of oneself. Negative perceptions of self—such as negative body image, low satisfaction in life, low self-esteem, and feelings of inferiority—are directly linked to an increased likelihood of depression and anxiety among adolescents (Goswami, Sachdeva, & Sachdeva, 2012; Kostanski & Gullone, 1998). College students who report loneliness—defined as an unpleasant emotional experience due to a lack of social support and relationships—are more likely to experience psychological distress, depression, and poor physical health (Arkar, Sari, & Fidaner, 2004; Wei, Russell, & Zakalik, 2005; Wright, King, & Rosenberg, 2014), with each of these outcomes strongly impacted by stress. In addition, Benner (2011) reported excessive levels of loneliness negatively impacted adolescents' academic achievement and progression. However, feelings of loneliness are not the only impacts of stress on college students' academic success.

Academic effects. School-related stressors—such as tests, assignments, grades, studying, and self-imposed performance demands—are some of the main sources of stress for adolescents (Kouzma & Kennedy, 2004). As with previous stressors, academic stress is linked with poor exercise, nutrition, and self-care (Wiedner, Kohlmann, Dotzauer, & Burns, 1996); is a risk factor for psychopathology (Wenz-Gross & Siperstein, 1997); and can negatively affect overall quality of life (Forouzandeh, Aslani, Mehralian, & Drees, 2016). Stress among college freshman has been demonstrated to negatively impact their ability to persist in coursework (Perrine, 1999), and undergraduates present higher levels of stress than both postgraduate and doctoral students (Nikanjam et al., 2016), potentially leading them to drop out if unable to cope effectively. As these stressors begin to compound with social, physiological, and psychological stressors, the

attention required to monitor and attempt to cope may impair an individual's ability to focus on his or her academic work (Guinote, 2007a, 2007b). Additionally, stressors may also inhibit the ability to engage in abstract thinking, an important component in academic and vocational success (Smith & Trope, 2006).

Long-term effects. While the body's stress response can be life-saving in response to acute stress, exposure to the response for prolonged periods of time can become toxic to the human body (McEwen, 2005). Chronic stressors, such as the social and academic pressures of college life, often persist throughout college, forcing the continuation of the stress response for prolonged periods of time. Prolonged exposure to the hormones released in the stress response, specifically cortisol, can produce damaging effects on health (Manenschijn et al., 2013). Persistent high levels of cortisol have been associated with abdominal obesity, hypertension, insulin resistance, and loss of mass in skeletal muscles, each of which is associated with cardiovascular disease (Björntorp & Rosmond, 2000; Kelly, Mangos, Williamson, & Whitworth, 1998). Further, increased cortisol levels as a result of long-term stress has been associated with decreased immune function (Hales, 2009), impaired memory recall (Labar & Cabeza, 2006), and general cognitive decline (Wilson et al., 2005). These findings further highlight the importance of developing appropriate coping mechanisms for stress early in life and engaging in activities that buffer the negative effects of long-term stress. While stress is predominately associated with negative outcomes, stress also has the potential for growth and increased performance on various tasks.

Eustress. The conceptualization of stress often results in negative associations among most individuals. However, stress, in the right situations, has the potential to produce positive outcomes such as increased performance and productivity (O'Sullivan, 2011; Selye, 1975).

Eustress is often defined as the process of responding positively to a stressor, and the positive outcome of this response (O’Sullivan, 2011). Stressors have the potential to be either positive or negative, with the distinction dependent upon individual perceptions of the stressor and the level of stress induced (Keller et al., 2012; Le Fevre, Matheny, & Kolt, 2003). Distress is associated with increased arousal of the stress response, suggesting the positive outcomes associated with eustress require an ideal, sub-maximal level of arousal (Le Fevre et al., 2003). Individuals place sub-maximal levels of stress on their bodies through physical activity or exercise, resulting in positive changes in both performance and productivity (Thygeson, 2018). The basic premise of exercise is to place the body under greater stress than it endures at rest, resulting in increased performance of the muscles and organs, as well as increased productivity of the energy and nutrient transport mechanisms in the body (Thygeson, 2018). This type of eustress not only engages the individual in a positive stress response, but it also provides many health benefits to counteract the negative outcomes of stress. For many adolescents, sports participation is the preferred means of physical activity.

Sports Participation

Sports participation is a popular way for young adults to stay physically active and establish gross motor skills associated with human movement. There are numerous types of sports including individual-based sports, team-based sports, indoor sports, and outdoor sports. The interaction between people and sports has the unique ability to mediate mental health disparities and stress while also helping individuals develop and cultivate the important psychological constructs associated with life satisfaction and overall well-being (Alvord & Grados, 2005; Benzie & Mychasiuk, 2009; Liu, Wu, & Ming, 2015).

The National Center for Education Statistics (2016) estimated 15,070,000 students were enrolled in high school during the 2015-2016 academic year. During that same year, the National Federation of State High School Associations (NFHS, 2016) reported 7,868,900 students participated in high school sports, with all-time high participation numbers for boys (4,544,574) and girls (3,324,326). With just over 52% of high school students participating in sports, the potential positive impact sports participation has on an individual's current health and future habits cannot be understated. Indeed, this idea has been recognized by the NFHS (2015), with their belief that sports participation helps encourage the development of "healthy lifestyles" for students. This feeling is also shared by many principals, teachers, and parents throughout the country (Veliz et al., 2017), as indicated by the high school sports participation rates. Previous researchers have supported this idea, linking sports participation with increased academic achievement and overall health (Farb and Matjasko, 2012; Feldman and Matjasko, 2005; Sabo and Veliz, 2008).

Sports participation is similar in its scope to exercise, both described as categories of leisure-time physical activity (Caspersen, Powell, & Christenson, 1985). Exercise is distinctly unique from physical activity in that it is planned, structured, repetitive, and purposive, with its intended outcome to improve or maintain elements of physical fitness (Caspersen et al., 1985). The components of physical fitness are divided into two main groups: one specifically related to improvements in health, and the other focusing on specific skills acquired that pertain to athletic ability (Pate, 1983). It is in this definition of physical fitness where the connection to sports participation becomes clear. Sports participation is a component of physical activity, and it is physical fitness focused primarily on the acquisition of skills relating to athletic ability and

performance. While improved health is not the primary focus of sports participation, it is an expected outcome that would come via the physical exertion experienced by participants.

History of high school sponsored sports. Sports have been an important component of American culture dating back to the early 17th century (Savage, Bentley, McGovern, & Smiley, 1929). School-sponsored sports first made their appearance, beginning in high schools and eventually filtering through all school levels, in the early 20th century as a result of the increasing popularity of collegiate athletics (Berryman, 1975). World War I played a pivotal role in shaping how schools view sports, not solely as a recreational opportunity but as a tool to develop the skills needed to be a contributing member of society during war and peace times (O'Hanlon, 1982). From this period on, sports became an integral part of the American education system.

College athletics. Most historians point to the rowing competitions between Yale and Harvard in the 1850s as the genesis of college sports in the United States (Savage et al., 1929). These competitions prompted Yale to begin hosting intramural contests beginning in 1859, in which Yale undergraduates were separated into 12 boating clubs competing against each other. In the years up to 1870, other sports such as cross country running, gymnastics, football, and baseball all became established collegiate sports. (Savage et al., 1929). From 1870 to 1877, many northeastern United States colleges participated in formal soccer contests against each other. During this decade, many sports began to create governing bodies, such as the Intercollegiate Association of Amateur Athletics of America, which was established in 1875. Along with the creation of governing bodies, the hiring of coaches and development of sport-specific training began to be more common, and the control of the sports teams was taken over by university administration instead of being left in the hands of the undergraduates. Up to the end of the 19th century, college athletics experienced rapid growth in participation and built organizational

capacity (Savage et al., 1929). Athletic conferences and associations, eligibility requirements, and the eventual formation of the National Collegiate Athletic Association (NCAA) all highlight important advancements in college sports leading up to the turn of the century. At the beginning of the 20th century, high school sports began to grow in response to the rapid expansion of college athletics.

Sports in the school system. The increasing popularity of college sports during the end of the 19th century entered the American public school system at the turn of the century as reformers were looking to restructure the system as a whole. This restructuring focused on creating a school environment that would prepare individuals for the urban and industrialist society of the United States in the 20th century (O'Hanlon, 1982). Organized competition among high schools first came into existence in 1903 with the creation of the New York Public School Athletic League (Reeve, 1908). Much like the origins of college sports, high school sports began primarily out of student initiative, but schools were quick to absorb athletics and assume responsibility for governance and regulation due to world events and legislative incentives (Berryman, 1975; Lewis, 1973; O'Hanlon, 1982).

Sports' rise in high schools can be attributed in large part to the Preparedness Movement spurred by World War I. The idea of mandatory military drill for high school boys was strongly pushed to create a society ready to defend its ideals. However, many prominent school educators and administrators argued that physical education (P.E.) programs could provide an avenue for promoting preparedness without encouraging militarism by providing lessons in social discipline and cooperation (O'Hanlon, 1982). Integral to this argument was the drastic shift in P.E. curricula to make sports and games the centerpiece. This curriculum shift centered around the idea that sports prepare boys and young men for life, both physically and psychologically

(O'Hanlon, 1982) and provide the character growth and development viewed as essential for the transition from childhood to adulthood (Berryman, 1975). Sports provided a way to control individualistic qualities and shift individual thinking towards being a team player while simultaneously providing students with a unique environment for actual practice of ideals learned in the classroom (O'Hanlon, 1982). In contrast, military drill did not offer any opportunity for experiencing adversity in the ways sports did, and thus P.E. was viewed as preparing students for peace just as much as for the prospect of war (O'Hanlon, 1982, Sarget, 1917).

As sports became the centerpiece of 20th century P.E. curriculum, national legislation thrust P.E., and thus sports, into the expected education of young adults. The passing of the Welsh Bill in 1916 required private and public schools to provide a minimum of 20 minutes per day of physical training for all students above the age of eight (O'Hanlon, 1982). Shortly after the Welsh Bill, states began passing their own P.E. education laws. Prior to 1915, only three states had P.E. laws; however, by the end of the 1920s, 36 states had passed laws regulating P.E. in schools (Lewis, 1973). Schools themselves took over the governance of the sports teams from the students during this period, with all but two states having high school athletic associations by 1924 (Wagenhorst, 1926). Lewis (1973) argues that the 1920s witnessed the triumph of sports becoming the focal point of P.E. curriculum in the United States. By the 1930s, Americans strongly believed sports promoted physical fitness, democratic living, sportsmanship, citizenship, and general education; they viewed it as paramount in overall character development of children and believed it provided the best prevention for juvenile delinquency (Berryman, 1973). Sports maintained their prominence and developmental importance throughout the 20th century, with the US government again stepping in to increase regulation, this time with an eye on gender equity.

Title IX. In 1972, Congress passed Title IX of the Educational Amendments to the 1964 Civil Rights Act. This legislation banned gender discrimination in educational institutions that receive federal funding, in theory applying to all components of schooling. In practice, however, Title IX is primarily known for requiring schools to raise its female athletic participation rate to that of males (Stevenson, 2010). This legislation represented a fundamental shift in organized sports participation for females, as fewer than 300,000, or 1 in 27, participated in 1972 (Stevenson, 2007; 2010). However, by 1978, when schools were required to comply with Title IX, 1 in 4 females participated in athletics (Stevenson, 2010), demonstrating the profound impact this legislation had on female sports participation. Title IX's impact on primary and secondary schools was furthered strengthened in 1992 by the Supreme Court case *Franklin v. Gwinnett County Public Schools*, which declared that schools could be held liable for discrimination toward women, including punitive damages (Stevenson, 2007). While sports participation among males and females is still unequal, the passing of Title IX and the subsequent Supreme Court case created a landscape where female sports participation is encouraged and supported.

Sports type. One common way to categorize sports is by differentiating team and individual sports. The important distinction between these two is whether the sports relies on an individual or a team of individuals to play the sport. The word *team* refers to a collection of individuals connected together in an activity (Merriam-Webster, 2018), with team sports involving a reliance on all other players to work together equally to accomplish specific tasks related to the sport (Baofu, 2013). Individual sports, conversely, rely solely on the individual to accomplish the intended outcome of the sport. This distinction is important, as some sports may appear to be a blend of the two. Sports such as track and field, wrestling, cross country, and swimming are defined as individual sports but for purposes of winning are scored as team events.

However, scoring of these events is dependent solely upon individual performance toward a specific task or outcome, with assistance from the team not impacting the individual outcome. For example, how well an individual does in the 200m race would be solely dependent upon that individual's performance, but his or her performance would be then equated to points assigned to a team. This distinction differs from team sports, such as soccer, in which individual performance does not directly dictate the team outcome; the collective performance of the team informs the outcome. Therefore, sports such as the former example are still deemed individual due to the lack of reliance on a team. Participation in individual or team sports yields different health and behavior outcomes due to the unique intrapersonal, interpersonal, and social environments within each type of sport.

Individual. By participating in individual sports, participants do not have the social pressures of interacting with peers in a team setting, and therefore they may be more focused on their individual performance and individual goalsetting (Denault & Poulin, 2018). Interestingly, Ball et al. (2016) reported that greater participation in individual sports in high school resulted in more normal BMI and significantly more days of vigorous physical activity. The authors suggest these findings may have to do with adults experiencing fewer barriers to participate in sports due to not having to rely on a team or specific sport facilities. Therefore, it may be easier for individuals to engage in individual sports into adulthood, leading to greater physical activity.

Nonetheless, individual sports may lack the social component of team sports, limiting positive social experiences for participants. Additionally, individual sports may lack the same opportunities as team sports for individuals to improve their emotional regulation, sense of initiative, and leadership skills (Denault & Poulin, 2016). Participation in individual sports, when compared to team sports, has been reported to increase depressive symptoms as well as peer

rejection (Perron-Gelinas, Brendgen, & Vitaro, 2017). Perron-Gelinas et al. (2017) suggest this increase may be due to an internalizing attribution style when facing negative events for individual sports participants.

Team. Participating in team sports provides individuals with opportunities to interact and engage with their peers and work together to accomplish a common goal. These interactions may provide individuals not just with an opportunity to improve their own social behavior, but also to create new friendships with peers, thus leading to an improved social standing (Perron-Gelinas, Brendgen, & Vitaro, 2017). Team sports involvement is positively associated with social acceptance and negatively associated with depressive symptoms (Boone & Leadbeater, 2006). These benefits may be due to the effect of positive experiences (coaching, skill development, peer support) in enhancing perceived social acceptance and reducing body dissatisfaction (Boone & Leadbeater, 2006). Barber et al. (2001) reported that participation in team sports was associated with lower social isolation later in life when compared to other pro-social, school-based activities. Additionally, team sports participation has been reported to protect against feelings of hopelessness and suicidality (Taliaferro, Rienzo, Miller, Pigg, & Dodd, 2008).

Social interaction is an important distinction between team and individual sports; however, the interpersonal influence is not always positive. Denault and Poulin (2018) suggest the interactions between team sports, peer status, and norms may influence individuals in their adolescent years. For example, individuals in team sports tend to spend more time socializing with their teammates, with peer influence potentially playing a large part in the behaviors of the individual. Indeed, Wichstrom and Wichstrom (2009) found that involvement in team sports increased reported alcohol intoxication among adolescents when compared to individual sports involvement. However, previous studies have pointed out that this association may have less to

do with team sports in general and instead on the individual behaviors of teammates and peers (Denault & Poulin, 2018; Vest & Simpkins, 2013). This finding suggests, then, that it may not simply be participation in team sports that leads to more negative health behaviors; it might instead be the behaviors of teammates and the culture of the team.

School-based versus club-based sports. School-based sports are often in direct competition with club-based sports in many communities, thus forcing adolescents and their families to decide which will provide the better experience. While both provide benefits associated with sports participation and physical activity, differences do exist. School-based sports can be socially beneficial to individuals in part due to the socially accepting and connected environment of school sports where the individual has pre-existing relationships with peers (Jewett et al., 2014). Additionally, school-based sports often occur on school grounds or nearby locations, eliminating any need for travel after school to practices. These same benefits cannot be said for club-based sports, with necessitated travel and practices occurring throughout the evenings. In addition, club-based sports require some financial commitment to participate, potentially acting as a barrier for some families. Due to these conditions, school-based sports present fewer barriers for participation and could potentially be more inclusive.

Individual Benefits of Sports Participation

Sports provide a unique setting within which important individual skills, concepts, and behaviors can be cultivated. This concept has been demonstrated in the literature, with student-athletes shown to be more likely than non-athletes to transfer life skills, self-esteem, and character traits into their career fields (Shiina, Brewer, Petitpas, & Cornelius, 2003; Weis, 2007). Previous research has associated participation in organized sports among high school students with greater academic performance and positive feelings towards school (Barber, Eccles, &

Stone, 2001; Eccles, Barber, Stone, & Hunt, 2003). Vicarious learning is a crucial component of sports participation in the development of adolescents, as they are able to learn coping skills, life tactics, and attitudes from their peers and coaches (Machida, Irwin, & Feltz, 2013). In the research of Machida et al. (2013), participants stated they experienced achievement through sports participation and that accomplishments in sports increased their confidence not only relative to the sport, but also in life. Individuals also used sports as a means of stress reduction, through physical exertion of negative emotions and energy.

Through the simple act of joining a sports team, students can put various social skills to the test. Meeting new people and interacting in unfamiliar social settings helps to develop individual confidence in building relationships (Hall, 2011; Machida, Irwin, & Feltz, 2013). The building of social networks is key for developing a sense of belonging, as well as building resilience. Hall (2011) reported in his study that almost all participants believed sports participation improved their resilience. Sports participation can provide a unique combination of physical activity, friendship, social networks, and personal satisfaction and growth, suggesting that sports are not just a source of physical health but, more importantly, of wellbeing (Hall, 2011; Machida et al., 2013; Pierce, 2010).

Motivation. To describe it concisely, the term *motivation* means to be moved to action (Ryan & Deci, 2000). Most everyone has experienced motivation to complete a task or engage in a particular action; however, motivation is defined by the underlying reasons that give rise to it. *Intrinsic motivation* refers to an individual being moved to action because he or she finds the action inherently enjoyable or interesting (Ryan & Deci, 2000). The opposite, *extrinsic motivation*, describes when an individual completes a task or action due to external influences such as peers, incentives, or pressure. Both extrinsic and intrinsic motivation play important roles

in sports participation and the behavioral and health outcomes individuals may experience through sports. In addition, with respect to sports performance, intrinsic and extrinsic motivation each provide their own distinct benefits. Intrinsic motivation is more important for quality of performance, while extrinsic motivation (i.e., via incentives) is more important for quantity of performance (Cerasoli, Nicklin, & Ford, 2014). Therefore, each motivational type provides distinct benefits in sports depending upon the type of performance needed.

Intrinsic motivation. Higher levels of intrinsic motivation are associated with increases in positive situational outcomes respective to the sport (Vallerand, 2012). Intrinsically motivated individuals engage in activities or actions for the personal challenge or fun involved, not due to external pressures or rewards (Ryan & Deci, 2000). However, Ryan and Deci (2001) argue that this type of motivation exists between the individual and a specific task and not as a static trait of the individual, suggesting that individuals are intrinsically motivated by tasks they feel are interesting and satisfying. As a result, intrinsic motivation for sports or physical activity can be influenced through participation. In this vein, feedback of performance has been demonstrated to affect intrinsic motivation both positively and negatively (Vallerand, 2012). However, if the individual does not perceive the feedback as being sincere, then any potential impact on intrinsic motivation is eliminated. How coaches and peers communicate with individuals plays a large role in shaping the type of motivation an individual feels for a sport and for physical activity in general.

The importance of developing intrinsic motivation towards sports and physical activity is demonstrated in its influence on life-long physical activity. Kilpatrick et al. (2005) discussed how intrinsic motivation is believed to support and facilitate maintenance of, and adherence to, a specific task. The authors reported that in their findings, sports participation was linked with

intrinsic motivation while exercise was linked more closely to extrinsic motivation. These findings are further supported by a more recent study conducted by Ball et al. (2014), in which the researchers found similar associations between motivation type and sports participation and exercise. These findings, coupled with the knowledge that intrinsic motivation leads to greater adherence and maintenance, suggest that sports participation may be the best medium for adolescents to develop intrinsic motivation toward physical activity, increasing the likelihood of a physically healthy lifestyle in adulthood.

Extrinsic motivation. Although intrinsic motivation is associated with greater adherence to physical activity into adulthood (Teixeira, Carraca, Markland, Silva, & Ryan, 2012), most activities or actions in which individuals partake beyond childhood are due to extrinsic motivation (Ryan & Deci, 2000). Individuals may still feel personally in control of the mechanisms through which they are motivated, even if extrinsic (Ryan & Deci, 2000). Participating in sports to socialize with peers or to attain a scholarship for college is extrinsically motivated, but the choice to participate still rests with the individual. Extrinsic motivation can be an important and positive influence on individuals to participate in sports, as they can receive the benefits of sports participation without initially valuing those outcomes. External influences may, then, persuade the individual to initially participate, allowing the individual's intrinsic motivation for the sports to develop. However, some components of extrinsic motivation may be detrimental to intrinsic motivation. Individuals involved in sports-related activities with the goal of receiving a trophy or reward report a decrease in situational intrinsic motivation (Vallerand, 2012). This reduction may be troubling in the context of physical activity, as many health promotion interventions often provide incentives in the form of rewards to encourage individuals to participate.

Skill regulation. Individual performance successes are directly related to improved levels of perceived *self-efficacy*, a term defined as an individual's confidence in his or her ability to accomplish a task (Bandura, 1977). An individual's self-efficacy increases through participation in sports and positive interactions with coaches and peers. Individuals who display high levels of self-efficacy are more likely to commit to, and use, better strategies in achieving assigned goals (Locke et al., 1989). The relationship between high self-efficacy and improved strategies is important because sports participation can not only act to foster skill regulation in a general sense, but it also can improve an individual's self-efficacy, in turn improving skill regulation. Adolescent sports participation is also associated with increased emotional control, emotional regulation, and self-knowledge (Eime, Young, Harvey, Charity, & Payne, 2013).

Skill feedback (coaches and peers). Even as personal performance success is associated with improved perceived self-efficacy, acknowledgement of these successes by coaches, peers, or parents can further enhance these perceptions. Another form of feedback called *vicarious experience*, defined as observing peers accomplishing difficult tasks, is an essential component in developing individual self-efficacy. This type of feedback has been demonstrated to increase an individual's physical activity self-efficacy (Ashford, Edmunds, & French, 2010). Through observing peers accomplishing tasks viewed as difficult, an individual can remove the element of impossibility, thereby increasing his or her self-efficacy in accomplishing them. This same result is found through feedback of peer performance, as well as comparative feedback between the individual and another peer (Bandura & Jourden, 1991). It is important to note that feedback of performance should focus on small successes and progress towards a larger goal, as adolescents may not be confident in their own ability to accomplish the goal (Bandura, 1997). This focus on smaller successes is particularly important during the initiation of a behavior, such as when

initially joining a sports team, as adolescents often lack confidence in their own ability (Rothman, 2000).

Positive experiences. The concept of social support is essential to sports participation for adolescents. Social support has been defined as “an exchange of resources between at least two individuals by the provider or recipient to be intended to enhance the well-being of the recipient” (Shumaker & Brownell, 1984, p.13). Within the sports realm, social support from coaches, parents, and peers is viewed as an important resource for student-athletes, with recovery from injury, sports participation, self-confidence, and performance all positively associated with social support (Holt & Hoar, 2006; Rees, 2007). Adolescents experience positive developmental outcomes when positive feedback, appropriate role modelling, and autonomy-supportive engagement styles are demonstrated by coaches and parents (Weis & Wiese-Bjornstal, 2009). Additionally, positive self-perception, emotion, and self-determined motivation are associated with positive peer social support (Smith & McDonough, 2008).

Appropriate feedback and overall social support in sports participation may provide additional benefits to individuals’ self-efficacy (McAuley, Talbot, & Martinez, 1999). In fact, interventions using feedback on past performance have been associated with increased levels of physical activity self-efficacy in participants (Ashford, Edmunds, & French, 2010). With this increased level of self-efficacy, individuals are then more confident in their ability to engage in sports.

Parental influence. Parents are often very involved in their child’s participation in sports, with their reactions and feedback to their children having the potential for both positive and negative outcomes (Fredricks & Eccles, 2004). Previous research has shown consistently that supportive actions from parents are associated with positive outcomes while controlling actions

are associated with negative outcomes, suggesting that parents should focus on supporting their children in sports settings (Holt, Tamminen, Black, Sehn, & Wall, 2008). Parental support has been associated with improved child socialization and positive psychosocial development through sports (Teques, Serpa, Rosado, Sliva, & Calmeiro, 2018). Parents play a large role in the selection of sporting activities for their children, with greater parental expertise in the sport being associated with more appropriate selections of sports for their children (Harwood & Knight, 2015). That is to say, presumably, parents have an intimate knowledge of their children's strengths and weaknesses which, along with sporting knowledge, might allow them to select sports their children will enjoy and continue to participate in. As sporting events become more competitive, the emotional intensity experienced by the players, coaches, and viewers (often mostly parents) increases as well. In these situations, parents can serve as positive role models in how they demonstrate emotional intelligence and control with the increasingly emotional demands of sports competition (Harwood & Knight, 2015). Parents act as role models for their children in all aspects, but this relationship is especially salient in the sports realm. Modeled behaviors and overall parental support have profound impacts on their child's development as well as the child's enjoyment and performance of sports.

Coaches' influence. Coaches also have the potential to play important roles in how high school sports impact youth. Adolescents participating in sports often include their coaches in their social support networks, with this relationship potentially impacting their behavioral self-concept (Dudovitz, Chung, & Wong, 2017). Dudovitz et al. (2017) postulate that by developing a healthy relationship with sports coaches, adolescents may develop a healthier sense of self-concept and avoid risky health behaviors, potentially buffering any negative impacts of peer influence. However, personal characteristics of the coaches are ultimately what determines the

successfulness of sports on positive youth development (Peterson, 2004). To this end, researchers have begun to study how autonomy-supportive or controlling behaviors towards athletes impact the athletes. Amarose and Anderson-Butcher (2015) reported that the use of autonomy-supportive practices is an effective motivational technique for coaches, while using controlling behaviors appears to be ineffective. Previous research has also indicated that an autonomy-supportive coaching style is positively associated with the psychological needs of autonomy and competence (Isoard-Gauthier, Guillet-Descas, & Lemyre (2012). These two constructs work to promote intrinsic motivation in individuals (Ryan & Deci, 2000). In addition, Isoard-Gauthier et al. (2012) found that an autonomy-supportive coaching style—which, in turn, helps support an athlete’s basic psychological needs and thus might improve intrinsic motivation—may prevent athlete burnout. As athletes continue through sports, coaches not only hold the power to positively influence their athletes developmentally and socially, but they can also help prevent burnout in their athletes, leading to greater improvements through sports.

Peer influence. Peer interactions through sports participation provide unique outcomes not found in other social settings. For example, Hall (2011) noted that individuals emphasized the importance of the social component of sports in identifying their sense of belonging. Through their participation, individuals felt they earned respect and recognition from their peers, a finding consistent with those of Holt et al. (2011), who reported sports participation improved individual social skills such as making new friends and working together. Mutual respect for one another in a sports setting can result in a socially-supportive environment that may serve to maximize individual self-efficacy (McAuley, Talbot, & Martinez, 1999). Individuals participating in sports also report higher social skill scores, suggesting peer interactions in sports provide an ideal

environment for developing and improving social skills (Eime, Young, Harvey, Charity, & Payne, 2013; Howie et al., 2010).

Collective efficacy. Similar to self-efficacy, collective efficacy refers to the shared beliefs of a group to engage in a particular behavior, organize individuals of the group, and execute a shared plan resulting in action required to meet a certain level of achievement (Bandura, 1997). Collective efficacy has been closely tied to sports due to its group focus and associations with performance (Myers, Feltz, & Short, 2004). While collective efficacy refers to the group's shared belief, it is still a product of individuals' perceptions and beliefs about the group's capabilities. Collective efficacy is nonetheless developed in much the same way as individual self-efficacy (Bandura, 1997). More so, an individual's perceptions of self-efficacy may be heavily linked with that of teammates, especially in team settings when individual performances do not have a large impact on the outcome (Bandura, 2000). This relationship is of particular interest for high school sports, as adolescents often seek self-approval from their peers (Harter, 1990). Through sports participation, individuals may enhance their own self-efficacy through the improvements of the collective efficacy of the team.

Negative experiences. While the benefits of sports participation are expansive, negative associations also exist. Researchers have commonly found links between adolescent participation and the consumption of alcohol, risky drinking behaviors, using smokeless tobacco, and use of performance enhancing drugs (Diehl et al., 2012; Kwan, Bobko, Faulkner, Donnelly, & Cairney, 2014; Mays, Gatti, & Thompson, 2011; Veliz et al., 2017). These links have been suggested to exist due increased access to different types of substances (Veliz et al., 2014) and the stress of athletic participation leading to self-medication (Morse, 2013; Reardon & Creado, 2014). In

addition, the unique social component of sports participation may itself lend itself to negative consequences for participants (Hughes & Coakley, 1991).

Within the literature, a distinction appears to be made between contact and non-contact sports and their social influence on the participant. Bourdieu (1978) argued that contact sports may cause individuals to view their bodies as disposable instruments. This mindset may then lead individuals, through social norms and expectations, to engage in substance use due to the risk-taking nature of contact sports and social expectations of concealing physical pain (Messner & Sabo, 1990). Veliz et al. (2017) reported that high school seniors who participated in high-contact sports reported higher rates of binge drinking and marijuana use up to four years post-high school, consistent with previous research (Veliz, Boyd, & McCabe, 2015). These associations have been suggested to continue into young adulthood (Veliz et al., 2015; 2017), placing the individual at increased risk for various physical and psychological health issues.

Physical injury. Participation in sports is not without its risk for suffering physical injury. The CDC (2006) defined sports injuries as those resulting from participation in high school sports practice or competition requiring attention from a medical professional and restricting participation for more than one day. Comstock et al. (2016) reported that for the 2016-2017 school year, there were an estimated total of 1,160,321 injuries due to high school sports. Injuries occurred both during competition and practice, with 699,410 during competition and 460,911 during practice. Injuries to the head/face (27.2%), ankle (17.8%), and knee (13.4%) accounted for over 58% of all injuries, but only 7.1% of total injuries required surgery (Comstock et al., 2016). However, with over one in four injuries occurring to the head, concussions have become an important topic of debate in high school sports.

Concussions. Sports-related concussions (SRCs) are of particular concern for high school athletes due to adolescence being the critical period for cognitive, social, and emotional development (McCroy, Collie, Anderson, & Davis, 2004; Stamm et al., 2015). Bryan et al. (2016) estimates that, in 2013, between 1.1 million and 1.9 million children under the age of 18 had a sports- or recreation-related concussion. More recently, DePadilla et al. (2018) reported that in the national Youth Risk Behavior Survey, approximately 2.5 million college students reported having at least one concussion in the past 12 months. Symptoms of concussions vary by individual and severity of trauma; however, common physical symptoms include headache, dizziness, fatigue, and sleep disturbances (Conder & Conder, 2015). Long-term, these symptoms can begin to impact academic performance and social development (Anderson, Spencer-Smith, & Wood, 2011). Another long-term symptom of SRCs is the neurodegenerative disease chronic traumatic encephalopathy.

Chronic traumatic encephalopathy (CTE) is associated with repeated traumatic brain injury (Stein, Alvarez, & McKee, 2015), both in the form of multiple concussions and subconcussive impacts to the head. CTE is difficult to diagnosis because its symptomology is similar to other diseases and a definitive diagnosis is only possible through an autopsy to confirm the presence of tau deposits in the brain (Jordan, 2013; Krongold & Chow, 2017; Stein et al., 2015). However, common symptoms include affective disorders, diminished motor control, impaired cognitive ability, and memory difficulty (Sundman, Doraiswamy, & Morey, 2015). Many popular high school sports in the United States—such as American football, ice hockey, and soccer—have been linked to the development of CTE; as a result, organizations have recently taken safety measures to more accurately and quickly diagnose a head injury (Stein et al., 2015). For example, the National Football League (NFL) has implemented new rule changes

over the past eight years designed to better protect the overall health of players, with specific focus on concussions (NFL, 2017). These changes, also adopted at the collegiate and high school levels, target the most dangerous plays that account for many head injuries in the sport, such as kickoffs and head-to-head tackles (NFL, 2017; Wiebe, D'Alonzo, Harris, Putukian, & Campbell-McGovern, 2018). Ice hockey has addressed the issue of head injuries by delaying the level in which players are allowed to body check from Pee Wee class (ages 11 to 12) to Bantam class (ages 13 to 14), with these changes implemented in both the United States and Canada (Krolikowski et al., 2017). U.S. Soccer implemented new rule changes in 2016 aimed to reduce head contact with the ball at younger ages. These rule changes include eliminating heading for children 10 years of age and younger and limiting the amount of heading in practice for children 11 to 13 years of age (U.S. Soccer, 2018).

Sports Participation and Health

Physical health. Physical activity, defined as bodily movement produced by the skeletal muscles that requires energy expenditure, provides numerous benefits to an individual's physical health (WHO, 2011). Sports participation provides a unique opportunity for adolescents to engage in physical activity in a structured, supervised, and supportive environment (Jewett et al., 2014). Due to this unique environment, sports participation has been linked with numerous health benefits. Studies have found that participating in sports for 2-3 hours a week significantly improves cardiovascular, metabolic, and musculoskeletal adaptations regardless of age and gender (Bangsbo et al, 2010). Researchers have established a direct link between sports participation in adolescence and adult physical activity (Ball, Bice, & Parry, 2014; Dohle & Wansink, 2013; Weiss, O'Loughlin, Platt, & Paradise, 2007). The strength of this connection is observed in the work of Smith et al. (2015), which reported participation in sports at age 10 was

highly associated with participation in physical activity at age 42. In addition, Dohle and Wansink (2013) found that the best predictor of physical activity after the age of 70 was high school sports participation. These associations can be attributed to the transition of skills gained through youth sports participation carrying into adulthood, easing many of the barriers to engaging in physical activity (Beunen et al., 2004; Vanreusel et al., 1997).

Physiological benefits. Sports participation and its underlying physical activity provide numerous physiological benefits. The maintenance of a healthy body weight, improvement of muscle and bone strength, and increase in flexibility are all attributed to physical activity engagement (CDC, 2015). Physical activity can also produce long-term benefits for the heart and lungs, help to reduce body fat, improve sleep, and alleviate stress (US Department of Health and Human Services, 2017). Other benefits of physical activity include improving blood flow to the brain and raising the levels of norepinephrine and endorphins, with these benefits potentially leading to reduced stress and academic improvement (Fleshner, 2000).

Physiological changes associated with increased and prolonged physical activity, such as reduction of body fat, may have an impact on individual perceptions of self and personal identity (Fox, 1999). Fox (1999) further suggested body image is more closely linked to self-esteem than another other component (Fox, 1997). Self-esteem, defined as an individual's appraisal of personal value and competence (Brausch & Decker, 2014), may develop in childhood and remain constant through adolescence (Overholser, Adams, Lehnert, & Brinkman, 1995). However, self-esteem becomes more important through adolescence as individuals are more aware and better able to evaluate themselves as an individual (Brausch & Decker, 2014). Low self-esteem during adolescence may persist, resulting in poor mental health (Lee & Hankin, 2009). However, physical activity provides a mean to improve one's body image, potentially

resulting in increased self-esteem (Fox, 1999). Increased Body Mass Index (BMI) scores have been associated with less positive views of body image (Metzler et al., 2001).

The link between physical activity, body image, and self-esteem is particularly important for its benefits on overall mental health. For example, reported negative body attitudes and feelings among adolescents were predictive of suicidal ideation, more so than reported levels of depression, hopelessness, and previous suicidal behavior (Brausch & Muehlenkamp, 2007). Additionally, high self-esteem is associated with psychological adjustment and persistence on difficult tasks (Di Paula & Campbell, 2002; Zeigler-Hill & Wallace, 2012), outcomes which become increasingly important through adolescence and young adulthood. Self-worth, a component of self-esteem and self-concept that is defined as a how a person thinks about him or herself (Shavelson, Hubner, & Stanton, 1976), is also positively influenced by physical activity. Interventions using only physical activity have demonstrated improvements in both self-worth and self-concept in adolescents (Liu, Wu, & Ming, 2015).

Additionally, the increased body core temperature that occurs during physical activity has been suggested to help trigger increased mood and relaxation (Fox, 1999), supporting the idea of physical activity as a means of stress reduction. Previous reviews of research have found that regular exercise consistently reduces stress (Crews & Landers, 1987) and that a single bout of moderate-to-vigorous-intensity exercise reduced body responses consistent with stress (Hammer, Taylor, & Steptoe, 2006). Physical activity has also been reported to lower feelings of anger and hostility (Edenfield & Blumenthal, 2011), both of which are linked to increased reactivity to stress (Gerin, Davidson, Christenfeld, Goyal, & Shwartz, 2006). Therefore, physical activity appears to be a viable means to help not just in the overall reduction of stress for an individual,

but also in the acute response to a stressor. For individuals who feel particularly stressed at a given moment, a single exercise session has the potential to relieve acute stress.

Mental Health. Mental health can also be improved through engagement in physical activity (Flegal et al., 2005; USHHS, 2008; Viridis et al., 2009). Specifically, college students who reported having met vigorous physical activity recommendations were less likely to experience poor mental health and perceived stress (VanKim & Nelson, 2013). Sports participation may also be a protective factor for mental health, with Skirka (2000) reporting that college athletes reported less perceived stress and psychological symptoms when compared to their non-athlete peers. Similar findings were reported by Jewett et al. (2014), who found that high school sports participation was associated with lower scores of depressive symptoms, lower perceived stress, and higher self-rated mental health. These findings were significant even after controlling for extracurricular sports participation and sociodemographic characteristics. Additionally, Gilman (2001) noted that participation in structured extracurricular activities (such as sports) is associated with higher life satisfaction among adolescents, with greater participation resulting in greater life satisfaction. The idea of life satisfaction has long been viewed as a core component to optimal development (Park, 2004), suggesting that sports can play a critical role in an individual's development. Existing research indicates that physical activity is associated with decreased risk of developing depression and can be an effective way to treat depression (Fox, 1999). Further, the treatment effect of physical activity on depression mirrors that of psychotherapeutic intervention. School sports may provide a unique environment in which factors positively impacting mental health are able to develop and grow (Jewett et al., 2014).

Physical activity and exercise also appear to have profound impacts on reducing anxiety among individuals. A reduction in self-reported anxiety symptom scores due to exercise was also

found to have similar results to meditation or relaxation interventions (Paluska & Schwenk, 2000). However, length of exercise was found to be important, with moderate duration (40 minutes) having the most significant effect on anxiety (Osei-Tutu & Campagna, 1998).

Individuals who participate in sports and meet the recommended levels of physical activity report higher levels of emotional self-efficacy (Valois, Umstatt, Zullig, & Paxton, 2008).

Social Health. Physical activity provides a unique opportunity for social interaction (Lubans et al., 2016). Individuals already share a set of common values (importance of physical health, body image, stress relief) which can make socializing an easier endeavor. Additionally, particular environments may promote informal social interactions, laying the groundwork for more formal interactions that can serve as the foundation for the development of social support structures. For example, the social interactions present in physical activity and participation in group exercise classes may provide social support to individuals, leading to improved self-esteem and overall life satisfaction (Fox, 1999). VanKim et al. (2013) reported that socializing was a partial mediator in the relationships between vigorous physical activity and mental health as well as physical activity and perceived stress. Therefore, peer interactions during physical activity play an important role of an individual's well-being (Lubans et al., 2016).

Academic Health. Higher levels of psychological well-being are associated with increased test scores as well (Ickovics et al., 2014). Specifically looking at adolescents, physical activity has been associated with greater improvements in cognitive functioning, brain structure, brain function, concentration, and memory (Donnelly et al., 2016; Singh, Uijtdewilligen, Twisk, VanMechelen, & Chinapaw, 2012). These benefits have been found to directly improve scores in mathematics and reading in as short as eight weeks (Donnelly et al., 2016). Negative health factors such as overweight and hypertension are associated with decreased cognitive function

due to the physical strain these factors place on the cardiovascular system (Shore et al., 2008; Unger, Kreeger, & Christoffel, 1990). Engaging in physical activity may, then, not only improve cognition overall but also work as a buffer by improving memory and concentration while reducing the effects of overweight and hypertension. In addition, more hours of physical activity have been directly linked with better academic achievement among adolescents (Carlson et al., 2008; Castelli, Hillman, Buck, & Erwin, 2007; Nelson & Gordon-Larsen, 2006). This association is further explained through a study conducted by Fox et al. (2010), in which increased hours of moderate-to-vigorous physical activity and participation in sports were each independently associated with higher GPA.

Theoretical Framework

Self-Determination Theory. The self-determination theory (SDT) was developed to help explain individual behavior and has been extensively used to examine individual motivation for physical activity (Deci & Ryan, 1985, 2000; Federeick-Recascino, 2002). The SDT posits that the psychological foundation upon which motives develop in individuals is a product of the psychological needs of competence, autonomy, and relatedness (Deci & Ryan, 1985; 2000). These psychological needs, then, and the subsequent resultant satisfaction help to predict psychological well-being and social development (Deci & Ryan, 2000, 2008). Given that the SDT seeks to understand how motives are developed through psychological needs, its relevance to physical activity lies in understanding how those needs might translate to individual motivation.

The SDT makes a distinction between the type of motivation individuals experience, differentiating between autonomous and controlled motivation. *Autonomous motivation* includes both intrinsic motivation and specific types of extrinsic motivation identified as those that add

value to a specific activity, such as exercise (Deci & Ryan, 2008). This type of motivation is described as coming from the self, without external pressure. In contrast, *controlled motivation* consists of external regulation in the form of punishment or reward, and introjected regulation where factors such as avoidance of shame, approval motive, and contingent self-esteem regulate the action. Individuals who experience controlled motivation often feel pressured to engage in a particular behavior or to think a certain way. These two types of motivation lead to different outcomes both short- and long-term, with autonomous motivation being associated with better psychological health and performance on skill-based activities (Deci & Ryan, 2008). Deci and Ryan (2000) argue that intrinsic motivation is the one true representation of “the positive potential of human nature” and suggest that it is essential to cognitive and social development. However, the SDT does not look to the cause of intrinsic motivation; instead it seeks to understand the conditions that help to stimulate and support it. These conditions—defined as measures of *competence*, *autonomy*, and *relatedness*—comprise the central foci of the SDT.

Deci and Ryan (2000) define the term *basic need* as a stimulating state that can produce improvements in health and well-being or contribute to an individual’s pathology and ill-being. The satisfaction of the state determines the outcome. Therefore, Deci and Ryan (2000) argue that the needs of competence, autonomy, and relatedness must each be satisfied for an individual to experience well-being. A social environment that supports an individual’s competence but not relatedness would then result in the individual experiencing sub-maximal levels of well-being. For individuals to achieve maximum well-being, they must have access to environments that work to support all three psychological needs. The importance of the psychological needs on an individual’s well-being has been demonstrated through previous studies. Sheldon et al. (1996) stated that daily variations in reported satisfaction of competence and autonomy predicted

variations in an individual's mood, physical symptoms, and self-esteem. Further, Reis et al. (2000) reported that fluctuations in the fulfillment of competence, autonomy, and relatedness were able independently to predict changes in daily well-being. Therefore, through the use of the SDT, individuals' levels of competence, autonomy, and relatedness can be reported to help predict their overall well-being. With respect to the current study, the SDT can be used to help understand how these constructs influence specific behaviors or actions.

Self-determination theory and physical activity. Participation in physical activity is closely linked to experiences with the three psychological needs that comprise the SDT (Bice, Ball, Parry, & Adkins, 2016). The SDT seeks to understand how these constructs influence individual motivation toward a behavior and how engaging in the behavior can work to strengthen those constructs, leading to greater motivation to continue the behavior. This theory is particularly salient for physical activity and exercise because it distinguishes between the nature and function of motivation as well as present social influences and how they impact the initiation and persistence of a behavior (Wilson, Mack, & Grattan, 2008). Previous research has linked satisfaction of psychological needs through exercise with individual well-being (Edmunds et al., 2007) and has found associations between more self-determined exercise motivation and psychological need satisfaction (McDonough & Crocker, 2007). Therefore, fulfilling basic psychological needs through physical activity can not only promote the development of self-determined motivation towards physical activity, but it can also promote psychological well-being (Deci & Ryan, 1985; 2000). Physical activity through sports participation, then, can lead to the same outcomes, providing an environment for the constructs of competence, autonomy, and relatedness to be developed and supported, while simultaneously creating a cyclical cause-and-effect leading to overall improvements in physical, psychological, and social health. McDonough

and Crocker (2007) observed in their study that motivation was predicted uniquely by all three need satisfaction constructs. They concluded that relatedness is indeed an important contributor to motivational processes for physical activity, an important finding since previous research has questioned the strength of its impact on motivation.

Competence. Competence describes the interaction individuals have with their environment and their ability to master challenging tasks and skills within that environment (White, 1959). This basic psychological need is fulfilled through the ability to bring about desired effects and outcomes (Reis et al., 2000) and is necessary for learning and development of skills within an environment (Deci & Ryan, 1985). Involvement in sports provides a supportive environment to develop and foster feelings of competence. Individuals are given instruction, feedback, time to make mistakes and master skills, and ultimately situations in which they are able to test their abilities to produce desired outcomes.

Autonomy. The construct of autonomy relates to the free agency of behavior choice and how behavior is believed to come from an internal, intrinsic source (Decharms, 1968). The term autonomy has been used in previous theories to describe individualism and independence, which, according to Deci and Ryan (2000), may imply a low level of relatedness. However, the SDT equates autonomy with a feeling of volition, i.e., that an individual consciously chooses to engage in an activity or event. This conceptualization of autonomy has been supported by previous research that has suggested positive links between an individual's relatedness to his or her parents and level of individual autonomy (Ryan et al., 1994). Autonomy, then, may be supported by relatedness instead of suggesting a lack of it. With respect to physical activity, it may exist as a medium for individuals to improve their sense of autonomy through greater control over body appearance and overall health behavior (Fox, 1999).

Relatedness. Relatedness refers to the need to belong and the ability to make meaningful connections within the individual's social environment (Baumeister & Leary, 1995). This need is fulfilled when individuals are able to connect with peers and feel involved in the social context of the environment (Deci & Ryan, 1985). Within the context of sports, individuals need to feel like they belong to the team, that their contributions are valuable, and that they can interact successfully with each member of the team. This concept is an integral component of team sports, as performance is largely an outcome of each individual working together as a team and communicating effectively the desired actions of the team.

Sports Participation and Resilience

The psychological construct of resilience refers to one's ability to achieve positive outcomes in the face of challenge, the possession of coping skills for traumatic experiences, and the avoidance of negative outcomes associated with risks (Alvord & Grados, 2005; Brooks, 2006; Luthar, Cicchetti & Becker, 2000). Resilient individuals are said to possess five attributes: social competence, problem-solving skills, critical consciousness, autonomy, and a sense of purpose (Zolkoski & Bullock, 2012). Social competence refers to qualities like empathy, communication skills, and a sense of humor (Bernard, 1993, 1995). Social competence is improved by sports participation through the establishing of positive relationships with coaches and peers (Zolkoski & Bullock, 2012). Additionally, Werner (1993) identified the teaching of individuals to help each other as an effective way to develop empathy and self-esteem. Through sports, individuals learn the value of teamwork and helping each other accomplish a common goal. Thus, sports participation can improve empathy and self-esteem, in turn increasing individuals' social competence.

Improved self-efficacy through sports participation also increases self-esteem, multiplying the effect of sports on resilience. Children who demonstrate problem-solving skills are able to think abstractly, coming up with alternative solutions to cognitive and social problems they may face. Physical activity improves cognitive functioning and, through sports participation, provides a supportive social setting with which solutions to problems can be tested. The attribute critical-consciousness refers to having an awareness of “structures of cruelty” and the ability to create strategies to overcome them (Zolkowski & Bullock, 2012, p. 2296). The ability of an individual to exert control over the environment he or she is in, to have a sense of identity, and to act independently are all components of autonomy. The unique setting of sports provides individuals with the means to develop autonomy through understanding their role on the team and gaining a better understanding of their own identity. The final attribute, sense of purpose, involves having goals, aspirations, and a positive belief in the future (Bernard, 1995).

Models of resilience. Fergus and Zimmerman (2005) have identified three models of resilience. These models are based upon the idea that both risks and promotive factors need to be present for resilience. Promotive factors—a category that includes assets and resources—help to protect against the negative effects of risk (Beauvais & Oetting, 2002). Assets include intrapersonal constructs such as competence, self-efficacy, and coping skills; resources for resilience can include parental support and adult mentoring (Fergus & Zimmerman, 2005). The compensatory model is defined as when a promotive factor eliminates the effect of a risk factor, with the promotive factor having a direct effect on the outcome. This model can be integrated into sports through the example of parental support or the positive mentoring of a coach eliminating the risk poor performance or defeat in competition. In the second model of resilience, called the protective factor model, promotive factors either moderate or reduce the effects of a

particular risk on the outcome (Fergus & Zimmerman, 2005). An example of this model in sports could be the moderating effect of high levels of individual self-efficacy on the negative risks of high emotional arousal associated with competition.

The last model of resilience discussed by Fergus and Zimmerman (2005) is the challenge model. In this model, exposure to too low or too high levels of a risk factor results in negative outcomes, but a moderate level of the risk can result in positive outcomes. The thought behind this model is that adolescents are exposed to high enough levels of risk to learn to cope and overcome the risk. This model best fits the concept of how sports can improve resilience in adolescents. Through sports, adolescents are constantly introduced to moderate-to-high levels of stress in various forms. This stress may come from performance anxiety, social anxiety, pressure from parents or coaches to perform well, and internal pressures to perform and prove oneself. As this model requires a moderate level of stress in order for the individual to develop coping mechanisms (Fergus & Zimmerman, 2005), it is important that more support be given to individuals as they first begin sports. This idea is consistent with developing self-efficacy through sports as well, as early failures may be debilitating for individuals, causing them to feel hopeless. This model of resilience is also closely tied to self-efficacy, as individuals learn coping mechanisms and how to resolve the conflict largely through social modeling or vicarious experience (Fergus & Zimmerman, 2005). Thus, this model again suggests why sports may provide an ideal setting for the development and cultivation of resilience.

Athletes experience sport-specific stressors in addition to the everyday stressors to which individuals are exposed (Sarkar & Fletcher, 2014). For this reason, sports may provide a more ideal situation for individuals to develop their resilience if they are able to cope with the added stressors. Individuals in sports experience adversity defined as competitive stressors, which

include concepts such as preparation, injuries, pressure, expectations, self-presentation, rivalry, and underperforming (Sarkar & Fletcher, 2014). Also specific to sports are organizational stressors, with four categories existing: leadership and personal issues (demands of coaches, support staff, sports officials, media); cultural and team issues (teammates behaviors, communication, team atmosphere, roles, cultural norms); logistical and environmental issues (weather, travel, rules, training, facilities and equipment); and performance and personal issues (injuries, money, nutrition) (Sarkar & Fletcher, 2014). Each of these stressors has been identified in previous research to be both physically and psychologically demanding, with inadequate coping mechanisms causing these stressors to become overwhelming (Fletcher, Hanton, Mellalieu, & Neil, 2012; Kristiansen & Roberts, 2010). However, the protective factors used to counteract or overcome these stressors are not necessarily sport-specific. While sports may introduce more stressors to an individual, they certainly provide greater opportunity to develop protective factors and to engage with risk factors at a moderate level, leading to the development and support of resilience in individuals.

Through sports participation, individuals learn and develop valuable self-regulation skills. With these skills, they establish and achieve goals and work towards aspirations. In fact, self-regulation is one of the most important protective factors related to resilience (Alvord & Grados, 2005; Benzies & Mychasiuk, 2009). Another crucial protective factor is self-concept (Werner, 1986). Self-concept may improve through physical activity (Liu, Wu, & Ming, 2015), an important component of any sport. Other protective factors for resilience include family, social, and community support (Benzies & Mychasiuk, 2009). One important component of community support identified by Benzies and Mychasiuk (2009) is having non-parental positive role models. Through sports participation, individuals are able to interact and engage with their

coaches, with these individuals potentially serving as role models. Sports also provide a supportive environment for the creation of new social support systems for individuals, providing further protective factors. Lastly, school has been found to be a protective factor of resilience (Morrison, Robertson, Laurie, & Kelly, 2002). Having a positive view of school and school activities helps to protect against antisocial behavior.

When individuals engage in sports, the structured nature of this environment is ideal to develop and cultivate their resilience. Fergus and Zimmerman (2005) believe that involvement in extracurricular activities, self-efficacy for health-promoting behavior, and social skills for connecting to peers are assets essential to develop in individuals to promote resilience—and sports participation satisfies each of these items. Individual self-efficacy increases through physical activity. Individual social skills are improved through the development of social networks and interactions with coaches and teammates. Indeed, Hall (2011) found in his study that almost all participants believed participation in sports improved their resilience, specifically related to how they felt stronger and more able to handle hard times or adversity. The idea that sports improve resilience is shared by male and female athletes of different disciplines, location, and age, including young adult CrossFit athletes in the US (Simpson et al., 2017), adolescent gymnasts in Australia (White & Bennie, 2015), adolescent swimmers in Canada (Fraser-Thomas & Côté, 2009), and former collegiate and professional athletes in the US (Galli & Vealey, 2008). More importantly, many of these athletes reported that the skills acquired through sports were transferrable to other life domains (Fraser-Thomas & Côté, 2009; Galli & Vealey, 2008; Pierce, 2010), specifically identifying resilience as one of the skills. Numerous researchers have also established sports to be important in the development of resilience in individuals, with athletes consistently reporting significantly higher resilience scores than non-athletes (Baltatescu &

Kovács, 2013; Galli & Reed, 2012; Guest, 2018; Gulbin, Oldenziel, Weissensteiner, & Gagné, 2010; Johnson, 2015; Laborde, Guillén, & Mosley, 2016; Lipowski, Lipowska, Jochimek, & Krokosz, 2016; Sahin et al., 2017).

The relationship between resilience and sports extends to other domains for individuals. Sports achievement has been positively correlated with resilience among students (Hosseini & Besharat, 2010), suggesting that experiencing personal success in sports helps develop resilience. In addition, Peck et al. (2008) found that participation in extracurricular activities, including organized sports, predicted educational resilience in adolescents, supporting the idea that resilience developed through sports can be transferred to other domains. A crucial component of sports, physical activity, has been demonstrated to be predictive of resilience in college students (Ozkara, Kalkavan, Alemdag, & Alemdag, 2016) as well as high school students through participation in physical education classes (Back, 2015).

Sports has been demonstrated to have a positive impact on the level of resilience for participants regardless of gender, geographic location, and socioeconomic status (Guest, 2018; Gulbin, Oldenziel, Weissensteiner, & Gagné, 2010; Hosseini & Besharat, 2010) Further, the development and cultivation of resilience in sports appears to be transferrable to other domains, with the ability to cope with and grow from failure crucial to success in sports, academics, and life in general. Resilience also potentially plays an important role in the development of another psychological skill that has been extensively linked with positive behavior change, self-efficacy (Simpson et al., 2017).

Sports Participation and Self-Efficacy

Bandura (1997) noted that the performance of behavior is largely determined by self-efficacy beliefs and outcome expectations, with self-efficacy becoming increasingly more

important as behaviors become more complex and difficult. Cultivating self-efficacy, then, should be a crucial outcome as individuals progress through adolescence and into adulthood. However, creating inviting environments for adolescents in which self-efficacy can be developed can be challenging. Nonetheless, sports participation appears to satisfy the conditions through which self-efficacy can be enhanced.

Behavior is a product of an individual's intellectual and physical capacities as well as his or her perceptions of the environment (Glanz, Rimer, & Viswanath, 2008). Therefore, to change behavior, one must introduce a new environment from which new learning experiences occur, capacity development is supported, and perceptions are able to be modified. Through the introduction of the social cognitive theory (SCT; Bandura, 2004), Bandura outlined four major ways in which self-efficacy can be developed: mastery experience, social modeling, improving physiological states, and verbal persuasion. Table 1 below (Glanz et al., 2008) provides definitions of each method for increasing self-efficacy.

Mastery experience. Performance accomplishments provide the best source of information for individuals to judge their self-efficacy, since these accomplishments are based on mastery experience (Feltz, 1998). As individuals engage in sports, they are constantly bombarded with feedback regarding their mastery of skills specific to the sports. Practices, and to some degree competitions, provide ideal environments to foster self-efficacy through mastery experience. Successful coaches are able to clearly communicate expectations to their players, break down complex skills into a sequence of easier skills, and provide appropriate feedback. Through these conditions, players are able to develop and eventually master sport-specific skills through repeated attempts and appropriate feedback on their execution. These mastery experiences, then, help to improve individual self-efficacy (Bandura, 1977). However,

Table 1. *Methods for Increasing Self-Efficacy.*

Mastery experience	Enabling the person to succeed in attainable but increasingly challenging performances of desired behaviors. The experience of performance mastery is the strongest influence on self-efficacy belief.
Social modeling	Showing the person that others like themselves can do it. This should include detailed demonstrations of the small steps taken in the attainment of a complex objective.
Improving physiological states	Making sure people are well-rested and relaxed before attempting a new behavior. This can include efforts to reduce stress and depression while building positive emotions—as when “fear” is re-labeled as “excitement.”
Verbal persuasion	Telling the person that he or she can do it. Strong encouragement can boost confidence enough to induce the first efforts toward behavior change.

Note. Adapted from Bandura (1997).

repeated failure has an expectedly negative effect on self-efficacy, so building skill competence through practice and the breaking down of complex skills is imperative to building strong self-efficacy. Additionally, strong self-efficacy towards specific sports movements, for example, may reduce the negative impact of failures experienced (Bandura, 1977).

Whereas practice provides a cultivating environment to develop and enhance self-efficacy, competition presents a more high-stakes environment, though competition can provide a different type of mastery experience used to help improve self-efficacy. Whereas success in competition works to improve self-efficacy, failure in competition settings may also produce the

same effect. According to Bandura (1977), performance desensitization is another method to improve self-efficacy through performance accomplishments. As individuals continue to participate in sports, they gradually become desensitized to the attachment of responsibility on themselves for the outcome. In this sense, the negative effects of failure are reduced, thus allowing self-efficacy to continue to develop through practice and competition. Another unique way competition can help to foster self-efficacy is if repeated competition failure is followed by eventual success through persistence and determination, often demonstrated in sports. Through this scenario, the individual finds that even the most difficult tasks can eventually be mastered through sustained effort (Bandura, 1977).

Social modeling. Social modeling, often referred to as vicarious experience, is another important component of not only self-efficacy but sports in general. Individuals often use peers and teammates to help develop their own expectations of performance. Through peer modeling of actions and behaviors perceived to be difficult or threatening and subsequent successful performance without negative consequences, individuals are able to generate expectations they too can perform those actions and behaviors successfully (Bandura, 1977). This way of improving self-efficacy relies on social comparison, with individuals believing that if their peers are able to accomplish the task, they should be able to do so as well. Sports provides a particularly suitable environment for social modeling to improve self-efficacy in that the successful performance of a task is immediately evident. Bandura (1977) suggested that modeled behavior without a clear outcome reduces the effect on self-efficacy. Additionally, the successful modeling of the behavior by multiple individuals, such as a sports team, also provides greater benefit to individual self-efficacy.

Improving physiological states. Individuals often evaluate their levels of anxiety and stress by noting the level of emotional arousal tied to a particular situation, with high arousal leading to decreased performance (Bandura, 1977). Evaluation of emotional arousal as too high or threatening can lead to even higher levels of arousal in the individual, well beyond that of the initial situation. Previously discussed methods to improve self-efficacy of social modeling and mastery experience can help to desensitize the individual to the situation, leading to more optimal arousal levels for performance (Bandura, 1977).

Social modeling can also provide effective coping mechanisms for high arousal events, such as competition in sports, providing individuals with the skills to acquire behavioral control. Behavioral control not only applies to the individual's physiological state but can also influence how the individual appraises the situation (Bandura, 1977). Individuals perceiving the environment as less stressful will likely experience less emotional arousal, maintaining a more optimal level of arousal for performance.

Through mastery experience, individuals increase their self-efficacy for a particular situation, potentially leading to lower self-arousal (Bandura, 1977). As individuals become more familiar with the situation, their emotional appraisal will begin to become less intense, lowering stress and anxiety levels. When individuals are better able to control their physiological states through mastery experience and social modeling, self-efficacy for the particular task may improve. It is important to note these two previous methods of improving self-efficacy provide important buffers against emotional arousal of potentially stressful situations, such as competitions. Thus, creating environments where mastery experience and social modeling can be cultivated will result in greater competition performance for individuals, not just through those mechanisms alone, but also through the positive impact of improving their physiological state.

Verbal persuasion. Coaches and teammates frequently use verbal persuasion to encourage players to accomplish the set-out goal or task. Within sports, this persuasion is accomplished through basic, non-specific encouraging messages. However, individuals also use verbal persuasion to elicit memory retrieval. In this sense, peers use messaging such as “You can do it, just like we practiced!” or “You’ve done it in practice, now do it in the game!” These messages ask the individual to recall memories of successful performance specific to the task at hand, serving not only to improve individual self-efficacy through verbal persuasion, but also to remind the individual of mastery experiences of the same or similar task. Through this coupling of verbal persuasion and a reminder of past successes with the same task, individuals are more likely to exert greater effort, potentially leading to better performance (Bandura, 1977). This idea is especially important in sports, as verbal persuasion to accomplish a task without previous success with the task may both discredit the individuals persuading and negatively impact individual self-efficacy (Bandura, 1977). Therefore, verbal persuasion needs to be used carefully and in the appropriate settings in order for it to facilitate development in self-efficacy.

Physical activity and self-efficacy. Sports represent a potentially ideal environment for the development and cultivation of self-efficacy through the above-mentioned methods. This increased sense of self-efficacy is also able to be transferred not only to similar situations, such as the physical activity components of sports, but also to behaviors that are definitively different (Bandura, 1977). This transfer of self-efficacy is a crucially important concept as sports may act as a vehicle to cultivate individual self-efficacy for physical activity. High levels of self-efficacy towards physical activity have been demonstrated to produce positive behavior developments regarding physical activity and therefore potentially leading to greater health outcomes. For example, Shields et al. (2010) reported that self-efficacy was a stronger predictor of physical

activity levels for students experiencing depressive symptoms than for students not currently experiencing depressive symptoms, thus highlighting the importance of self-efficacy in engaging in physical activity for individuals who are experiencing poor mental health.

The concept of self-efficacy can act as both an outcome of, and an influencing factor for, physical activity participation (McAuley & Blissmer, 2000). Due to this relationship, the importance of self-efficacy in maintaining a physically active lifestyle cannot be understated. Indeed, this connection is highlighted by McAuley and Blissmer's (2000) findings that changes in exercise behaviors over time were related to changes in self-efficacy. However, many studies have demonstrated that self-efficacy is a significant predictor of exercise adherence (Chiu, 2009; McAuley & Blissmer, 2000; Shields, Spink, Chad, & Odnokon, 2010; Tsai & Coleman, 2009). More specifically, self-efficacy appears to play a more important role in predicting the adoption of exercise behavior, with it having little impact on maintenance. However, long-term exercise interventions have been shown to increase self-efficacy (McAuley, Lox, & Duncan, 1993). This relationship may point to self-efficacy's impact in the initial adoption and adherence of exercise, whereas consistent maintenance of exercise might instead work to improve self-efficacy. This concept is supported in a study conducted by Strong et al. (2008) where they found that physical activity self-efficacy was significantly correlated with VO_2 max percentile, a common measure of cardiorespiratory fitness. Thus, increasing or maintaining one's physical fitness increases an individual's self-efficacy for physical activity. This phenomenon may be explained further by the findings of Mueller and Ackley-Holbrook (2016) in which the researchers observed significant increases in physical activity self-efficacy from pre-test to post-test for students participating in a school running program. They hypothesized the increase was due to a reduction of barriers to

participating in physical activity for the students, giving the students the confidence to overcome barriers and engage in physical activity.

Sports participation introduces unique factors that may play a role in the development of self-efficacy for individuals. Researchers have identified the importance of time efficacy, or making time for regular active physical activity, as an important predictor of physical activity (Tsai & Coleman, 2009; Williams & Kim, 2014), with Williams and Kim (2014) arguing it is a necessary condition for the maintenance of physical activity. Individuals participating in sports need to be able to manage their time effectively to complete school work, make it to practices and games, and maintain other important hobbies or activities in their lives. Therefore, time efficacy and physical activity self-efficacy in general may be developed through time commitment of sports. Additionally, the social component of sports can also influence individual self-efficacy. When individuals believe that their teammates are confident in their ability to accomplish a specific task, individual self-efficacy, enjoyment, and attitude increase as a result (Jackson, Gucciardi, Lonsdale, Whipp, & Dimmock, 2014). These relationships highlight the importance and effectiveness of verbal persuasion and social modeling as a means to improving self-efficacy.

Self-efficacy is a concept that has been studied extensively by numerous health fields, and its importance for behavior change and positive health outcomes is well documented. However, little research has explored effective ways to improve individual self-efficacy with the intention of improving overall health. Sports, in theory, provide an ideal environment for self-efficacy development and cultivation, and recent studies have demonstrated the potential impact they can have on self-efficacy.

Summary

Adolescence is a period of transition shaped by increasing independence and physical and mental maturity. This transition period is also a crucial time to develop and establish habits that will become lifelong and continue through adulthood; however, this period is also highlighted by increasing stress associated with transiting into a university setting or professional career.

Individuals begin to have more independence and control over their behaviors and actions, with personal health being one of the most important. With increased independence, individuals also experience new stressors and adversities that pose a risk to overall health. These stressors can directly impact social relationships, academic performance, stress levels, and mental and physical health. Without proper development during this period, individuals may not acquire necessary skills to maintain adequate health and overcome new obstacles.

Sports provide unique settings where individuals are given opportunities to develop and cultivate key psychological concepts of self-efficacy and resilience. Increased self-efficacy equips an individual with the personal confidence to engage in specific behaviors, with sports participation potentially directly impacting an individual's self-efficacy for future physical activity. Additionally, sports participation may improve an individual's resilience, providing coping mechanisms and additional skills to handle increased stressors present in adolescence and young adulthood.

CHAPTER 3

METHODS

The following chapter outlines the processes involved in conducting the present study, including research type and design, study methods, and sample selection. Finally, the chapter will provide information about the construction of the study instrument, including pre-pilot and pilot studies and how subsequent results from these preliminary inquiries have informed the proposed instrument, data collection, and data analysis for the main study.

Research Design

This study will employ a cross-sectional research design using stratified random sampling. This sampling technique divides a total sample into sub-samples, defined as strata, all of which share a specific set of similar characteristics (Onwuegbuzie & Leech, 2007). With respect to this study, the division is based on geographical regions within the United States, from which a random sample will be drawn from each. This sampling technique aims to select a sample in such a way that priority sub-populations can be equally represented, thus creating a more representative overall sample (Onwuegbuzie & Leech, 2007; Teddlie & Yu, 2007). Once a random sample has been drawn from each stratum, the principal investigator will use a purposive method to select universities from which college freshman will be surveyed. Purposive sampling—while a non-random or nonprobability type of sampling—is commonly used to create a sample with a specific purpose in mind (Tashakkaori & Teddlie, 2010). More specifically, it can be used to achieve representativeness with respect to a particular type of case as well as to achieve comparability across different types of cases (Teddlie & Yu, 2007). Using purposive sampling at this stage will ensure that universities are selected whose demographic

characteristics match similarly to their respective regions. This step will again serve to provide a sample more representative of each region and thus the United States as a whole.

Participant and Sample Selection

This study used the Bureau of Economic Analysis' (n.d.) breakdown of regions in the United States to stratify the overall sample, which includes eight different regions: New England, Mideast, Great Lakes, Plains, Southeast, Southwest, Rocky Mountain, and Far West. Table 2 shows the states within each region and the percentage of the US population found within each region (Bureau of Economic Analysis, n.d., U.S. Census Bureau, n.d).

The number of universities selected from each region was determined based upon the percentage of the US population found in each region. Table 3 outlines the number and names of states selected from each region. States were randomly selected from each region using a random number generator. The number of states randomly selected from each region was based on the percentage of the US population found in each region. One state was selected from each region with less than 5% of the US population, two states from each region with 5-15% of the US population, and three states from regions with more than 15% of the US population.

From each state, a four-year university was purposively selected to ensure the demographic characteristics of the university's population were similar to its respective region. For regions from which multiple states were selected, the university demographics were pooled to create an aggregate percentage to compare to the region. Table 5 outlines the demographic characteristics of the eight regions, with Table 6 showing the pooled demographic characteristics of the universities for each region.

Table 2*Regions of the United States and their Respective Populations*

Region	States	Population	% of US Population
New England	Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont	14,810,001	4.6%
Mideast	Delaware, District of Columbia, Maryland, New Jersey, New York, Pennsylvania	49,368,668	15.2%
Great Lakes	Illinois, Indiana, Michigan, Ohio, Wisconsin	46,885,244	14.4%
Plains	Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota	21,294,107	6.5%
Southeast	Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, West Virginia	83,715,076	25.7%
Southwest	Arizona, New Mexico, Oklahoma, Texas	41,339,800	12.7%
Rocky Mountain	Colorado, Idaho, Montana, Utah, Wyoming	12,055,738	3.7%
Far West	Alaska, California, Hawaii, Nevada, Oregon, Washington	56,250,544	17.3%

Table 3*States Selected from Each Region*

Region	% of US Population	Number of States Randomly Selected	State(s) Selected
New England	4.6%	1	Rhode Island
Mideast	15.2%	2	District of Columbia, Pennsylvania
Great Lakes	14.4%	2	Illinois, Michigan
Plains	6.5%	1	Nebraska
Southeast	25.7%	3	Florida, Georgia, Tennessee
Southwest	12.7%	2	Oklahoma, Texas
Rocky Mountain	3.7%	1	Wyoming
Far West	17.3%	3	California, Hawaii, Washington

However, not all identified universities agreed to participate in the study. Universities were contacted via initial and follow-up email. If no response was received, each university contact received two phone calls in an attempt to solicit participation. For regions in which universities did not respond or chose not to participate, convenience sampling was employed to ensure adequate geographical representation in the overall sample. Because states representing each region were randomly selected, when originally randomly identified universities did not agree to participate, the convenience sampling approach applied to selecting a university within the region, thereby eliminating the random selection of states to represent that region in the sample. Furthermore, one region will not be represented in the present study due to nonresponse

from multiple institutions after many attempts; specifically, no university from the New England region will be participating in the study, thus limiting the study's representativeness (see Chapter 5 for a final discussion of limitations). Furthermore, both the Southeast and Far West regions only have two participating universities instead of the three originally proposed. Table 4 indicates the final list of, and number of, participating universities and furthermore identifies which agreed to participate through random selection or via convenience. The following three tables display demographic characteristics of the geographic regions, selected universities, and how the proposed sample would compare to overall national demographics (Tables 5-7).

Each participating university has been contacted and provided initial information regarding the study, with information that the proposed timeline includes dissemination of the survey to freshmen classes during Fall Semester 2019. All necessary Human Subjects Committee (HSC) or Internal Review Board (IRB) paperwork for each university will be completed and approved prior to data collection. Students will receive an email with a link to the online survey, with information stating that completion of the survey indicates individual consent to participate in the study.

Sample estimation. The RStudio software package (2016) was used to estimate the appropriate sample size needed to produce meaningful results. Using a standard effect size (medium, 0.15) and power (0.80) in addition to the maximum number of predictors to be used in each of the regression models (14), a minimum sample size of 120 is required. Therefore, to account for incomplete responses to the survey, I will seek a minimum sample size of 250.

Table 4*Universities Selected for Study*

Region	State(s) Selected	University Selected
New England**	Rhode Island	None
Mideast**	New York*	State University of New York College (SUNY) at Cortland
Great Lakes	Illinois	Illinois State University (ISU)
	Michigan	Central Michigan University (CMU)
Plains	Nebraska	University of Nebraska at Kearney (UNK)
Southeast**	Florida	University of South Florida (USF)
	Tennessee	University of Tennessee Martin (UTM)
Southwest	Oklahoma	Oklahoma State University (OSU)
	Texas	Stephen F. Austin University (SFA)
Rocky Mountain	Utah*	Westminster College (WC)
Far West**	Hawaii	University of Hawaii Hilo (UHH)
	Washington*	University of Washington (UW)

*Indicates universities selected via convenience.

** Indicates regions where the number of universities selected has been reduced due to lack of response.

Table 5*Bureau of Economic Analysis' US Regions' Demographic Characteristics*

Region	White Only	Black/African American	American Indian	Asian	Native Hawaiian	Two or more races	Hispanic
New England	81.9%	5.5%	0.6%	3.5%	0.1%	2.1%	8.2%
Mideast	56.6%	24.3%	0.6%	6.2%	0.1%	2.5%	12.7%
Great Lakes	75.6%	11.6%	0.6%	3.2%	0.1%	2.1%	7.8%
Plains	81.4%	5.4%	2.8%	2.6%	0.1%	2.3%	6.4%
Southeast	67.0%	21.7%	0.6%	2.3%	0.1%	1.9%	7.3%
Southwest	50.6%	7.0%	6.6%	3.0%	0.2%	3.3%	32.2%
Rocky Mountain	80.1%	1.7%	2.9%	1.8%	0.3%	2.5%	12.2%
Far West	52.8%	4.7%	3.8%	13.4%	2.3%	7.9%	18.3%

Note: Data for U.S. Demographics from U.S. Census Bureau (n.d.)

Table 6*Demographic Characteristics of Selected Universities by Region*

Region	White Only	Black/African American	American Indian	Asian	Native Hawaiian	Two or more races	Hispanic
New England	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mideast	73.8%	5.8%	0.2%	1.3%	0.1%	2.2%	12.3%
Great Lakes	75.9%	8.6%	1.0%	2.2%	0.1%	2.2%	6.9%
Plains	78.7%	2.1%	0.1%	0.9%	0.1%	2.1%	9.9%
Southeast	53.5%	9.9%	0.2%	5.5%	0.1%	3.3%	15.9%
Southwest	63.4%	8.6%	3.0%	1.6%	0.1%	7.0%	10.6%
Rocky Mountain	76.0%	1.0%	1.0%	2.0%	1.0%	6.0%	10.0%
Far West	42.6%	3.7%	1.3%	24.0%	3.3%	3.2%	7.0%

Note: Data for U.S. Demographics from U.S. Census Bureau (n.d.), data for university enrollment from SUNY Cortland (n.d.), ISU (2018), CMU (2018), UNK (2018), USF (n.d.), UTM (n.d.), OSU (n.d.), SFA (n.d.), WC (2019), UHH (n.d.), UW (n.d.).

Table 7

Demographic Characteristics of Selected Sample Compared to U.S. Population

	White Only	Black/African American	American Indian	Asian	Native Hawaiian	Two or more races	Hispanic
Selected Sample	58.7%	7.4%	1.2%	8.4%	0.9%	3.7%	10.6%
United States	76.6%	13.4%	1.3%	5.8%	0.2%	2.7%	18.1%

Note: Data for U.S. Demographics from U.S. Census Bureau (n.d.), data for university enrollment from SUNY Cortland (n.d.), ISU (2017), CMU (2017), UNK (2018), USF (n.d.), UTM (n.d.), OSU (n.d.), SFA (n.d.), WC (2019), UHH (n.d.), UW (n.d.).

Instrumentation & Refinement

Pre-pilot study. In Fall Semester 2017, a pre-pilot study was conducted to help determine the reliability and validity of survey instrument items to be used in the main study. This study was also used to identify potential issues related to face validity of the instrument by asking participants to highlight any confusing wording in the questions and provide feedback on the overall structure of the survey.

Pre-pilot data were collected from a convenience sample of students from Southern Illinois University Carbondale in an entry level (100-level) elective kinesiology course. The course is one of a small number of options in which every incoming freshman must enroll and is

not associated with students' selected major, nor does it provide credit hours towards a specific major. Participants were given extra credit toward the class if they chose to participate in the study, and students who chose not to participate in the study were provided an equal, alternative extra credit assignment to complete. Participants completed the paper surveys in a classroom setting at the beginning of their scheduled class time.

Students were given a brief description of the study and an explanation of the extra credit opportunities, and interested students were given a consent form to read and sign. Consenting participants then received the survey, and upon completion, the principal investigator retrieved the survey from each participant. The study took approximately 10 minutes to complete. This pre-pilot study was approved by the host institution's Human Subjects Committee (HSC).

Pre-pilot instrumentation. The pre-pilot survey included 65 items consisting of five scales and demographic questions. The survey can be found in Appendix B, along with the Humans Subjects Committee's (HSC) approval letter. The scales included in the pre-pilot study included the New General Self-Efficacy Scale, 10-item Connor-Davidson Resilience Scale, Self-Efficacy and Exercise Habits Scale, Social Self-Efficacy Scale, and the Psychological Need Satisfaction in Exercise Scale.

New General Self-Efficacy Scale. The New General Self-Efficacy Scale (NGSE) was created to be a more parsimonious and valid measure of self-efficacy (Chen, Gully, & Eden, 2001). The NGSE assesses an individual's self-efficacy through eight items with responses ranging from 'strongly disagree' to 'strongly agree.' The scale is scored on a 5-point Likert-type scale, and a mean score is established. Individuals with higher mean scores are said to be more self-efficacious. The NGSE has been shown to be a valid tool for measuring self-efficacy in the general population, and specifically with college students (Chen, Gully, & Eden, 2001).

10-item Connor-Davidson Resilience Scale. The 10-item Connor-Davidson Resilience Scale (CD-RISC) was developed by Campbell-Sills and Stein (2007) as a response to the original CD-RISC's inconsistency among differing sociodemographic and cultural populations (Jorgensen & Seedat, 2008; Karairmak, 2010; Yu, Lau, Mak, Zhang, & Lui, 2011). The 10-item CD-RISC consists of 10 questions measured on a 5-point Likert-type scale with scores summed across all items. Individual CD-RISC scores are negatively correlated with depression scores, as measured by the Brief Symptom Inventory 18 (BSI; Derogatis, 2001), suggesting a higher score on the 10-item CD-RISC not only represents higher resilience in an individual, but also less likelihood of experiencing negative psychological distress (Campbell-Sills & Stein, 2007). Previous studies have reported the 10-item CD-RISC as a valid tool among multiple populations (Aloba, Olabisi, & Aloba, 2016; Campbell-Sills & Stein, 2007).

Self-Efficacy and Exercise Habits Survey. The Self-Efficacy and Exercise Habits Survey (SEEH) is a 12-item, 5-point Likert-type scale that asks individuals how confident they are to complete specific behaviors for at least six months. The SEEH has two factors within it: "sticking to it" and "making time for exercise." The SEEH is an abbreviated version of a similar scale but has been shown to be highly correlated with the original version and is thus considered to be an equally-valid tool (Sallis, Pinski, Grossman, Patterson, & Nader, 1988).

Social Self-Efficacy Scale. The Social Self-Efficacy Scale (SSE) is a component of the Self-Efficacy Scale, which consists of the SSE and General Self-Efficacy Scale (GSE). The authors of the scale note its ability to be used independently of the GSE and that it is a valid tool to measure an individual's self-efficacy in social situations or environments that require interactions with others, such as maintaining a job (Sherer & Adams, 1983). The scale features

six items measured on a Likert-type scale that ask questions about an individual’s behavior and feelings in social situations.

The Psychological Need Satisfaction in Exercise Scale. The Psychological Need Satisfaction in Exercise Scale (PNSE) is an 18-item scale developed from the self-determination theory (Deci & Ryan 1985, 2002), consisting of 3 subscales (competence, $n = 6$; autonomy, $n = 6$; relatedness, $n = 6$) (Wilson, Rogers, Rodgers & Wild, 2006). Previous studies have indicated the PNSE has appropriate internal consistency estimates among the three subscales ($\alpha > 0.90$) (Bice, Ball, Parry, & Adkins, 2016; Wilson et al., 2006).

Pre-pilot study data collection and analysis. One hundred eleven individuals ($n = 111$) volunteered to participate in the pre-pilot study. Survey scales were assessed for internal consistency, a component of reliability, by calculating Cronbach’s α for each scale. For scales that included multiple constructs, Cronbach’s α was calculated for each construct. Internal consistency results are displayed in Table 8 below.

Table 8
Internal Consistency for Pre-pilot Study Instrument

Scale	α
NGSE	0.864
CD-RISC	0.835
SEEH	
Sticking to it	0.820
Making Time for Exercise	0.568
SSE	0.734
PNSE	
Competence	0.914
Autonomy	0.939
Relatedness	0.863

All scales and individual constructs reported high levels of internal consistency ($\alpha > 0.70$), except for the 'Making Time for Exercise' construct within the SEEH. This low level of reliability, along with insignificant findings through data analysis of the pre-pilot study, led to the elimination of the SEEH and the SSE from the survey instrument. These scales did not adequately address the research questions presented in the main study and were therefore removed after the pre-pilot study.

Attempting to measure increases in general self-efficacy through high school sport participation, as demonstrated in the pre-pilot study, provided no significant results. Many researchers contend that self-efficacy is a trait-specific construct and therefore needs to be measured with regard to a specific trait or activity (Caprara, Alessandri, & Eisenberg, 2012; Pajares, 2002; Pintrich & Schunk, 1995). Bandura (1986; 1989) stated self-efficacy is both task- and situation-specific. Thus, the use of a general self-efficacy scale in this study may not have accurately represented the self-efficacy beliefs of individuals increased through high school sport participation. Further, assessing an individual's self-efficacy towards physical activity or exercise might provide a better understanding of the relationship between high school sport participation and self-efficacy. Therefore, the general self-efficacy scale was removed and replaced with a scale measuring self-efficacy for physical activity in the pilot study.

Pilot study. Through the findings from the pre-pilot study and subsequent changes to the proposed instrument, the principal investigator chose to complete an additional pilot study to assess the reliability and validity of revised instrument. Additionally, the pilot study used an online version of the survey—a method aligned with that proposed for the national study—to ensure the different type of administration did not result in significant differences in participant responses.

Participants were recruited at Southern Illinois University Carbondale through an entry level (100-level) public health course. Similar to the kinesiology course used in the pre-pilot study, this course also fulfills a required elective for all incoming students but is not associated with their selected major nor provides credit hours for that major. Participants were given extra credit toward the class if they chose to participate in the study, and students who chose not to participate in the study were provided an equal, alternative extra credit assignment to complete. An introductory page of the online survey outlined the scope of the study, contact information of the investigators, and that consent would be implied through completion of the survey.

Pilot study instrumentation. The survey included the CD-RISC, PNSE, and demographic questions from the pre-pilot study. Additional demographic questions were added, and an explanation of these questions is provided in this section below. Bandura's (2006) Self-Efficacy to Regulate Exercise Scale (SERES) was used to measure self-efficacy with respect to physical activity. In addition, the IPAQ questionnaire was added to the pilot study. The survey can be found in Appendix A of this document and is the same as the survey for the main study.

Self-Efficacy to Regulate Exercise Scale. The Self-Efficacy to Regulate Exercise Scale (SERES) is an 18-item Likert-type scale developed by Bandura (2006). The scale is used to assess daily events that may occur in individuals' lives that may prevent them from completing exercise. Previous research by Cornick (2015) identified two subscales within the SERES: emotional issues and external influences. Additionally, exploratory and confirmatory factor analysis discovered that three questions in the scale significantly loaded on both subscales and were subsequently removed from the scale (Cornick, 2015). The pilot and main study will feature the new 15-item SERES with subscales of emotional issues and external influences. Limited literature exists evaluating the reliability and validity of the SERES; therefore, the pilot

study assessed reliability and validity of the instrument for its use in the sample, the results of which will be described subsequently.

International Physical Activity Questionnaire - Short Form. The International Physical Activity Questionnaire (IPAQ) – Short Form is a seven-question instrument designed to examine individual physical activity levels over the seven days prior to survey administration (Maddison, 2007). Participants provide how much time, in minutes or hours, they spent doing vigorous and moderate intensity exercise in addition to the amount of time they spent walking and sitting. The IPAQ – Short Form has been previously tested for reliability and validity and is a universally accepted assessment tool for physical activity (Helmerhorst, Brage, Warren, Besson, & Ekelund, 2012; Maddison et al., 2007).

Demographic Questions. Various demographic variables were collected from participants in the study. Participants were asked to provide information associated with the following characteristics: sex, height, weight, race, collegiate athlete status, high school GPA, ACT score, ZIP code of their high school residence, SAT score, how many years they participated in high school sports, and what high school sports they participated in. Individuals were also able to write in high school sports not listed to ensure less-traditional sports were still included. In order to differentiate between traditional and non-traditional freshmen students, and in attempt to control some variability in the impact of high school sport participation on the survey measures, participants were asked if they moved directly from high school to university or if they took some time off between high school and university attendance.

ZIP Code data were used to create a Rural-Urban Continuum Code (RUCC) for each participant's high school residence. The RUCC variable was created by taking each individual's ZIP code of high school residence to determine county, then using the Office of Management

and Budget’s (OMB) data to determine the appropriate RUCC variable for each county, based upon population (United States Department of Agriculture, 2016). This variable classifies counties by population and adjacent population, providing a metric for urban or rural classification.

Pilot study data collection and analysis. Twenty-eight individuals ($n = 28$) volunteered to participate in the online pilot study. Survey scales were assessed for internal consistency by calculating Cronbach’s α for each scale. For scales that included multiple constructs, Cronbach’s α was calculated for each construct. Internal consistency results are displayed in Table 9 below. The Self-Efficacy to Regulate Exercise Scale (SERES) reported an internal consistency of $\alpha = 0.932$, well above the threshold for high internal consistency ($\alpha > 0.70$). The CD-RISC and PNSE reported high levels of internal consistency, uniform with the results from the pre-pilot study.

Table 9
Internal Consistency for Pilot Study Instrument

Scale	α
CD-RISC	0.819
SERES	0.932
PNSE	
Competence	0.944
Autonomy	0.954
Relatedness	0.972

Study Procedures

Data Collection. For the proposed primary study, the pilot instrument will be replicated both in content and format (i.e., with final revisions and delivered in an online format). The complete survey can be found in Appendix A. Prior to the beginning of the Fall 2019 semester,

the principal investigator will contact each participating university to establish the survey dissemination procedures. Universities may opt to send out the survey link to their students themselves or provide the primary investigator with email addresses for the students. Regardless of dissemination procedure, surveys will be sent out to participating students one week after the semester has begun. Two weeks after this first wave of contact, an additional wave will occur, followed by a third and final wave two weeks after the second wave. All efforts will be taken to ensure that only students who have not completed the survey will be contacted in the second and third waves, though this task may prove to be difficult if the universities choose to disseminate the survey on their own.

As discussed previously, the minimum number of participants needed to produce a study with a standard medium effect size and power with 14 variables is roughly $N = 120$. However, given the number of participating universities in the study, the potential for incomplete surveys, and assuming a 50% response rate for the survey, a minimum number of 500 surveys will be sent out. Additional waves beyond the third will be considered if the number of surveys sent or complete surveys received do not meet the minimum values set *a priori* by the primary investigator.

Data Analysis. Participants' responses to types of sports in which they participated during high school will be categorized as individual sports, team sports, or a mix of individual and team sports based upon if one competes individually (individual sport) or as a part of a team (team sport) (Lorimer & Jowett, 2009). Sports in which participants compete individually but as part of a larger team—such as swimming or track and field—will be categorized as individual sports, as the participant's individual performance is what determines the outcome for that particular event (in contrast to a collective team sport such as in basketball or soccer). However,

events such as relays in individual sports (swimming, track and field) more closely mirror team sports and therefore will be categorized as a combined sport.

Individual responses to the IPAQ will be coded into two separate variables. Responses to the amount of moderate and vigorous physical activity will be coded into a dichotomous variable to indicate whether participants had met the American College of Sports Medicine (ACSM) physical activity guidelines (Physical Activity Guidelines Advisory Committee, 2018), which state that adults should accumulate a minimum of 150 minutes per week of moderate-to-vigorous physical activity (i.e., 0 = does not meet the guideline, 1 = meets the guideline). In addition, number of minutes spent engaging in moderate or vigorous activity will be summed to create a continuous variable that will be used in the regression models discussed below.

Pearson correlations will be used to examine associations between various demographics and individual constructs within the survey. Analysis of variance (ANOVA) tests will be conducted to determine if differences exist among groups using the demographic data. Due to the stratified random sampling method providing region-specific data for participants, geographic region will also be included as a demographic variable in the analyses and coded based upon the geographic region from which the participant will be sampled. Demographic questions will be coded to allow for linear regression analyses to be run using dummy variables. The variables of body mass index (BMI), years of high school sports played, number of sports played, and RUCC distinction will be treated as continuous variables in the regression analyses. The variables of college freshman status, sex, collegiate athlete, and if the individual participated in high school sports will be treated as dichotomous variables. Finally, geographical region, race/ethnicity, GPA, ACT score, SAT score, and the type of sport participated will be coded as categorical variables. Ordinary least squares (OLS) multiple linear regression models will be created for the

assessments SERES and CD-RISC and for each subscale of the PNSE (competence, autonomy, relatedness) with the assessment/subscale representing the dependent variable. Each model will use the demographic variables as well the continuous variable collected from individual responses to the IPAQ. Data will be analyzed using SPSS version 25, and results will be deemed significant at $p < 0.05$.

Research Questions and Analyses Performed

Each research question will be measured via specific items from each scale used in the final instrument. Table 10 provides linkage between research questions, measurement items, variables, and proposed data analysis methods.

Table 10

Research Questions and Analyses Performed

Research Questions	Items	Dependent Variables	Independent Variables	Data Analysis
1. What influence does previous participation in high school sports have on exercise self-efficacy among freshmen?	Self-Efficacy to Regulate Exercise Scale Items: 2 Demographic Items: 20, 21	Exercise Self-Efficacy	High School Sport Participation	Independent Sample t-test, ANOVA, <i>Post Hoc</i> Analyses

2. What influence does previous participation in high school sports have on resilience among college freshmen?	10-item Connor Davidson Resilience Scale Items: 1 Demographic Items: 20, 21	Resilience	High School Sport Participation	Independent Sample t-test, ANOVA, <i>Post Hoc</i> Analyses
3. What demographic characteristics are associated with higher exercise self-efficacy among college freshmen?	Self-Efficacy to Regulate Exercise Scale Items: 2 Demographic Items: 4-10, 11, 12, 13, 14, 15, 16, 17, 18, 19	Exercise Self-Efficacy	Demographic Variables, Region	ANOVA, <i>Post Hoc</i> Analyses, Multiple Regression
4. What demographic characteristics	10-item Connor Davidson	Resilience	Demographic Variables, Region	ANOVA, <i>Post Hoc</i> Analyses,

are associated with higher resilience among college freshmen?

Resilience Scale
Items: 1

Demographic
Items: 4-10, 11, 12, 13, 14, 15, 16, 17, 18, 19

Multiple Regression

5. What influence does previous participation in high school sports have on psychological need satisfaction (PNSE) among college freshmen?

Psychological Need Satisfaction in Exercise Items: 3

Demographic
Items: 20, 21

Competence, Autonomy, Relatedness

High School Sport Participation

Independent Sample t-test, ANOVA, *Post Hoc* Analyses

6. What demographic characteristics are associated with higher scores of PNSE among college freshmen?	Psychological Need Satisfaction in Exercise Items: 3	Competence, Autonomy, Relatedness	Demographic Variables, Region	ANOVA, <i>Post Hoc</i> Analyses, Multiple Regression
	Demographic Items: 4-10, 11, 12, 13, 14, 15, 16, 17, 18, 19			

Summary

This chapter presented a comprehensive overview of the methods for conducting the proposed study. Specifically, this chapter discussed the research design to be used; methodology used in the sample and participant selection; design and results of both the pre-pilot study and pilot study and how they influenced the final design for the main study; proposed data collection and analysis; and an overview of the research questions, respective survey questions associated with the questions, and the appropriate analyses to be performed to answer the questions.

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Appendix A

Consent to Participate in Research Study

My name is Eric Wiedenman. I am a graduate student at Southern Illinois University-Carbondale.

I am asking you to participate in my research study. The purpose of my study is to determine the role of high school sport participation on college freshman's exercise self-efficacy and resilience. Additionally, this study will look at other factors (team/individual sports, academic performance, urban/rural distinction) to see if they play a role in an individual's exercise self-efficacy and resilience. Lastly, this study will also assist in measuring the validity and reliability of the survey that will be used in a later study.

I am only asking for college freshman to complete the survey. Participation is voluntary. If you choose to participate in the study, it will take approximately 10 to 15 minutes of your time. You will read each question of the survey carefully and answer them to the best of our ability. Your decision to participate or withdraw from this study will have no impact on your academic standing in this course or with the University.

All your responses will be kept confidential within reasonable limits. Only those directly involved with this project will have access to the data.

Completion of the online survey will indicate voluntary consent to participate in this study.

Thank you for taking the time to assist me in this research. If you have any questions about the study, please contact me.

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This project has been reviewed and approved by the SIUC Human Subjects Committee. Questions concerning your rights as a participant in this research may be addressed to the Committee Chairperson, Office of Sponsored Projects Administration, SIUC, Carbondale, IL 62901-4709. Phone (618) 453-4533. E-mail: siuhsc@siu.edu

Sports Participation, Resilience, and Exercise Self-Efficacy

* 1. For each of the questions listed below, designate your level of agreement or disagreement with the statements as it relates to you:

	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree
I am able to adapt to change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can deal with whatever comes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I try to see the humorous side of problems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Coping with stress can strengthen me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tend to bounce back after illness or hardship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can achieve goals despite obstacles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can stay focused under pressure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am not easily discouraged by failure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think of myself as a strong person	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can handle unpleasant feelings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

A number of situations are described below that can make it hard to stick to an exercise routine. Please rate how certain you are that you can get yourself to perform your exercise routine regularly (three or more times a week).

* 2. Rate your degree of confidence by recording a number from 1 to 5 using the scale given below:

	1 Cannot do at all	2	3 Moderately can do	4	5 Highly certain can do
When I am feeling tired	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	1 Cannot do at all	2	3 Moderately can do	4	5 Highly certain can do
When I am feeling under pressure from work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
During bad weather	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
After recovering from an injury that caused me to stop exercising	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
During or after experiencing personal problems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I am feeling depressed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I am feeling anxious	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
After recovering from an illness that caused me to stop exercising	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I feel physical discomfort when I exercise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
After a vacation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I have too much much work to do at home	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When visitors are present	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When there are other interesting things to do	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I don't reach my exercise goals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Without support from my family or friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
During a vacation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I have other time commitments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
After experiencing family problems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Sports Participation, Resilience, and Exercise Self-Efficacy

* 3. For each of the questions listed below, designate your level of agreement or disagreement with the statements as they relate to physical activity/exercise:

	1	2	3	4	5
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I feel that I am able to complete exercises that are personally challenging	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel confident I can do even the most challenging exercises	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel confident in my ability to perform exercises that personally challenge me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel capable of completing exercises that are challenging to me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel like I am capable of doing even the most challenging of exercises	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel good about the way I am able to complete challenging exercises	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel free to exercise in my own way	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel free to make my own exercise program decisions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel like I am in charge of my exercise program decisions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel like I have a say in choosing the exercises that I do	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel free to choose which exercises I participate in	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	1	2	3	4	5
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I feel like I am the one who decides what exercises I do	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel attached to my exercise companions because they accept me for who I am	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel like I share a common bond with people who are important to me when we exercise together	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel a sense of camaraderie with my exercise companions because we exercise for the same reasons	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel close to my exercise companions who appreciate how difficult exercise can be	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel connected to the people who I interact with while we exercise together	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel like I get along well with other people who I interact with while we exercise together	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

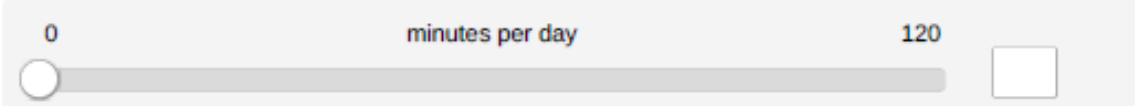
We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the **last 7 days**. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the **vigorous** activities that you did in the **last 7 days**. **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

- * 4. During the **last 7 days**, on how many days did you do **vigorous** physical activities like heavy lifting, digging, aerobics, or fast bicycling?

- * 5. How much time, **in minutes**, did you usually spend doing **vigorous** physical activities on one of those days?

0 minutes per day 120

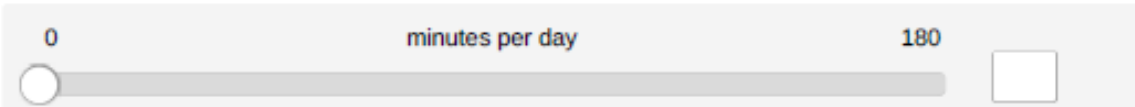
A horizontal slider control for question 5. It features a circular knob on the left, a horizontal track, and a square input box on the right. The text "0 minutes per day" is on the left and "120" is on the right.

Think about all the **moderate** activities that you did in the **last 7 days**. **Moderate activities** refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

- * 6. During the **last 7 days**, on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

- * 7. How much time, **in minutes**, did you usually spend doing **moderate** physical activities on one of those days?

0 minutes per day 180

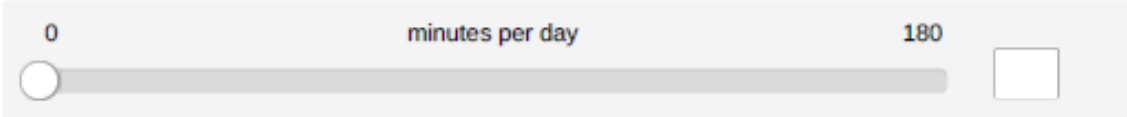
A horizontal slider control for question 7. It features a circular knob on the left, a horizontal track, and a square input box on the right. The text "0 minutes per day" is on the left and "180" is on the right.

Think about all the time you spent **walking** in the last **7 days**. This includes at work and at home, walking to travel from place to place, and any other walking that you have done solely for recreation, sport, exercise, or leisure.

* 8. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time?

* 9. How much time did you usually spend **walking** on one of those days?

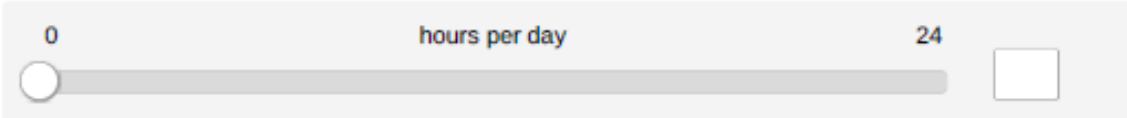
0 minutes per day 180



The last question is about the time you spent **sitting** on weekdays during the **last 7 days**. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

* 10. During the **last 7 days**, how much time did you spend **sitting** on a **week day**?

0 hours per day 24



* 11. Indicate which answer best describes you:

- I am a college freshman who has just finished high school. I am not a college freshman.
- I am a college freshman who has taken time off between high school and college.

* 12. What is your sex?

- Male
- Female
- Other

* 13. What is your height? (12 inches = 1 foot)

0 Inches 100

* 14. What is your weight? (1 kg = 2.2 lbs)

0 Pounds 350

* 15. What is your race/ethnicity?

- American Indian/Alaskan Native African American (non-Hispanic)
- Hispanic Multi-Racial/Ethnicity
- Asian/Pacific Islander Other
- Caucasian (non-Hispanic)

* 16. Are you an intercollegiate athlete?

- Yes
- No

* 17. What was your average GPA throughout high school?

0.0 - 2.0

3.1 - 3.5

2.1 - 2.5

3.6 - 4.0

2.6 - 3.0

* 18. If you took the ACT, what was your score?

1 - 15

26 - 30

16 - 20

31 - 36

21 - 25

I did not take the ACT

* 19. If you took the SAT, what was your score?

400 - 600

1201 - 1400

601 - 800

1401 - 1600

801 - 1000

I did not take the SAT

1001 - 1200

* 20. If you participated in high school sponsored sports, how many years did you participate?

* 21. If you participated in high school sponsored sports, what sports did you participate in? (Select all that apply)

- | | |
|---|--|
| <input type="checkbox"/> I did not participate | <input type="checkbox"/> Wrestling |
| <input type="checkbox"/> Basketball | <input type="checkbox"/> Football |
| <input type="checkbox"/> Soccer | <input type="checkbox"/> Volleyball |
| <input type="checkbox"/> Water Polo | <input type="checkbox"/> Ice Hockey |
| <input type="checkbox"/> Field Hockey | <input type="checkbox"/> Lacrosse |
| <input type="checkbox"/> Golf | <input type="checkbox"/> Tennis (singles only) |
| <input type="checkbox"/> Swimming (individual events only) | <input type="checkbox"/> Tennis (singles and doubles) |
| <input type="checkbox"/> Swimming (individual and relay events) | <input type="checkbox"/> Track and Field (individual events only) |
| <input type="checkbox"/> Cross Country | <input type="checkbox"/> Track and Field (individual and relay events) |
| <input type="checkbox"/> Baseball | <input type="checkbox"/> Diving |
| <input type="checkbox"/> Cheer | <input type="checkbox"/> Softball |
| <input type="checkbox"/> Dance | |

Other (please specify)

* 22. What is the zip code from the home you lived in during high school? (If you are an international student, write your country of origin)

Appendix B

Saluki attitudes on sport participation and confidence

For each of the areas listed below, designate and CIRCLE your level of agreement or disagreement with the statements – strongly disagree to strongly agree	Strongly disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
1. I will be able to achieve most of the goals I have set for myself.	1	2	3	4	5
2. When facing difficult tasks, I am certain that I will accomplish them.	1	2	3	4	5
3. In general, I think I can obtain outcomes that are important to me.	1	2	3	4	5
4. I believe I can succeed at most any endeavor to which I set my mind.	1	2	3	4	5
5. I will be able to successfully overcome many challenges.	1	2	3	4	5
6. I am confident that I can perform effectively on many different tasks.	1	2	3	4	5
7. Compared to other people, I can do most tasks very well.	1	2	3	4	5
8. Even when things are tough, I can perform quite well.	1	2	3	4	5
9. I am able to adapt to change.	1	2	3	4	5
10. I can deal with whatever comes.	1	2	3	4	5
11. I try to see the humorous side of problems.	1	2	3	4	5
12. Coping with stress can strengthen me.	1	2	3	4	5
13. I tend to bounce back after illness or hardship.	1	2	3	4	5
14. I can achieve goals despite obstacles.	1	2	3	4	5
15. I can stay focused under pressure.	1	2	3	4	5
16. I am not easily discouraged by failure.	1	2	3	4	5
17. I think of myself as a strong person.	1	2	3	4	5
18. I can handle unpleasant feelings.	1	2	3	4	5

Saluki attitudes on sport participation and confidence

Below is a list of things people might do while trying to increase or continue regular exercise. Whether you exercise or not, please rate how confident you are that you could really motivate yourself to do things like these questions consistently, <u>for at least six months</u> .	I know I cannot		Maybe I can		I know I can	Does not apply
19. Get up early, even on weekends, to exercise	1	2	3	4	5	8
20. Stick to your exercise program after a long, tiring day at work	1	2	3	4	5	8
21. Exercise even though you are feeling depressed.	1	2	3	4	5	8
22. Set aside time for a physical activity program; that is, walking, jogging, swimming, hiking, or other continuous activities for at least 30 minutes, 3 times per week.	1	2	3	4	5	8
23. Continue to exercise with others even though they seem too fast or too slow for you.	1	2	3	4	5	8
24. Stick to your exercise program when undergoing a stressful life change (e.g., divorce, death in the family, moving)	1	2	3	4	5	8
25. Attend a party only after exercising.	1	2	3	4	5	8
26. Stick to your exercise program when your family is demanding more time from you.	1	2	3	4	5	8
27. Stick to your exercise program when you have household chores to attend to.	1	2	3	4	5	8
28. Stick to your exercise program when you have excessive demands at work.	1	2	3	4	5	8
29. Stick to your exercise program when social obligations are very time consuming.	1	2	3	4	5	8
30. Read or study less in order to exercise more.	1	2	3	4	5	8
For each of the areas listed below, designate and CIRCLE your level of confidence that you can do these things. – strongly disagree to strongly agree	Strongly disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree	
31. It is difficult for me to make new friends.	1	2	3	4	5	
32. If I see someone I would like to meet, I go to that person instead of waiting for him or her to come to me.	1	2	3	4	5	
33. If I meet someone interesting who is hard to make friends with, I'll soon stop trying to be friends with that person.	1	2	3	4	5	
34. When I'm trying to become friends with someone who seems uninterested at first, I don't give up easily.	1	2	3	4	5	
35. I do not handle myself well in social gatherings.	1	2	3	4	5	
36. I have acquired my friends through my personal abilities at making friends.	1	2	3	4	5	

Saluki attitudes on sport participation and confidence

For each of the areas listed below, designate and CIRCLE your level of agreement or disagreement with statements as they relate to physical activity/exercise. – strongly disagree to strongly agree	Strongly disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
37. I feel that I am able to complete exercises that are personally challenging	1	2	3	4	5
38. I feel confident I can do even the most challenging exercises.	1	2	3	4	5
39. I feel confident in my ability to perform exercises that personally challenge me.	1	2	3	4	5
40. I feel capable of completing exercises that are challenging to me.	1	2	3	4	5
41. I feel like I am capable of doing even the most challenging exercises.	1	2	3	4	5
42. I feel good about the way I am able to complete challenging exercises.	1	2	3	4	5
43. I feel free to exercise in my own way.	1	2	3	4	5
44. I feel free to make my own exercise program decisions.	1	2	3	4	5
45. I feel like I am in charge of my exercise program decisions.	1	2	3	4	5
46. I feel like I have a say in choosing the exercises that I do.	1	2	3	4	5
47. I feel free to choose which exercises I participate in.	1	2	3	4	5
48. I feel like I am the one who decides what exercises I do.	1	2	3	4	5
49. I feel attached to my exercise companions because they accept me for who I am.	1	2	3	4	5
50. I feel like I share a common bond with people who are important to me when we exercise together.	1	2	3	4	5
51. I feel a sense of camaraderie with my exercise companions because we exercise for the same reasons.	1	2	3	4	5
52. I feel close to my exercise companions who appreciate how difficult exercise can be.	1	2	3	4	5
53. I feel connected to the people who I interact with while we exercise together.	1	2	3	4	5
54. I feel like I get along well with other people who I interact with while we exercise together.	1	2	3	4	5

55. What is your sex?

- Male
- Female
- Other

56. What is your height?

_____ Feet, _____ Inches

57. What is your weight?

_____ Pounds

58. What is your race/ethnicity?

- American Indian/Alaskan Native
- Hispanic
- Asian/Pacific Islander
- Caucasian (non-Hispanic)
- African American (non-Hispanic)
- Multi-Racial/Ethnicity
- Other

59. Are you an intercollegiate athlete?

- Yes
- No

60. What was your average GPA throughout high school?

- 0.0-2.0
- 2.1-2.5
- 2.6-3.0
- 3.1-3.5
- 3.6-4.0

61. If you took the ACT, what was your score?

- 1-15
- 16-20
- 21-25
- 26-30
- 31-36
- I did not take the ACT

62. What is the zip code from your high school home?
(If you are an international student, write your country of origin)

63. If you took the SAT, what was your score?

- 400-600
- 601-800
- 801-1000
- 1001-1200
- 1201-1400
- 1401-1600
- I did not take the SAT

64. If you participated in high school sponsored sports, in what year(s) did you participate? (Select all that apply)

- Freshman year
- Sophomore year
- Junior year
- Senior year
- I did not participate

65. If you participated in high-school sponsored sports, what sports did you participate in? (Please select all that apply)

- Basketball
- Soccer
- Water Polo
- Field Hockey
- Golf
- Swimming
- Cross Country
- Baseball
- Cheer
- Wrestling
- Other. Please specify
- Football
- Volleyball
- Ice Hockey
- Lacrosse
- Tennis
- Track and Field
- Diving
- Softball
- Dance

I did not participate

SIUC HSC FORM A

REQUEST FOR APPROVAL TO CONDUCT RESEARCH ACTIVITIES
INVOLVING HUMAN SUBJECTS

Project Title

The role of high school sport participation on self-efficacy and resilience

CERTIFICATION STATEMENT

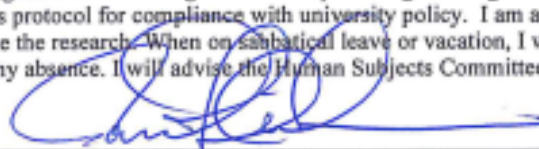
By making this application, I certify that I have read and understand the University's policies and procedures governing research activities involving human subjects. I agree to comply with the letter and spirit of those policies. I acknowledge my obligation to:

1. Accept responsibility for the research described, including work by students under my direction.
2. Obtain written approval from the Human Subjects Committee of any changes from the originally approved protocol **BEFORE** implementing those changes.
3. Retain signed consent forms in a secure location separate from the data for at least **three** years after the completion of the research.
4. Immediately report any adverse effects of the study on the subjects to the Chairperson of the Human Subjects Committee, SIUC, Carbondale, Illinois - 618-453-4533 and to the Director of the Office of Sponsored Projects Administration, SIUC. Phone 618-453-4540. E-mail: siuhsc@siu.edu

 9/29/17
Researcher(s) or Project Director(s) Eric Wiedenman Date

Please print or type name below signature.

RESEARCH ADVISOR/PROJECT DIRECTOR'S ASSURANCE: My signature on this application certifies that the student is knowledgeable about the regulations and policies governing research with human subjects and that I have thoroughly reviewed the student's protocol for compliance with university policy. I am aware of my obligations stated on Form A and will be available to supervise the research. When on sabbatical leave or vacation, I will arrange for an alternate faculty sponsor to assume responsibility during my absence. I will advise the Human Subjects Committee by letter of such arrangements.

 9/29/17
Researcher's Advisor or Faculty Sponsor (required for all student projects) Dr. Aaron Diehr Date

Please print or type name below signature.

The request submitted by the above-named researcher(s) was approved by the SIUC Human Subjects Committee.

This approval is valid for one year from the review date for non-exempt research. Unless the protocol is approved as exempt, researchers must request an extension to continue the research after that date. This approval form must be included in all Master's theses/research papers and Doctoral dissertations involving human subjects that are submitted to the Graduate School.

 10-4-17
Chairperson, Southern Illinois University Human Subjects Committee Date

HSC Approval letter (exempt)

To: Eric Wiedenman

From: Kimberly K. Asner-Self 
Chair, Human Subjects Committee

Date: October 5, 2017

Subject: *The role of high school sport participation on self-efficacy and resilience*

Protocol Number: 17240

The revisions to the above referenced study have been approved by the SIUC Human Subjects Committee. The study is determined to be exempt according to 45 CFR 46.101(b)2. This approval does not have an expiration date; however, any future modifications to your protocol must be submitted to the Committee for review and approval prior to their implementation.

Your Form A approval is enclosed.

This institution has an Assurance on file with the USDHHS Office of Human Research Protection. The Assurance number is FWA00005334.

KAS:kr

cc: Aaron Diehr