SPORTS PARTICIPATION AND ACADEMIC ACHIEVEMENT:

DOES SELF-EFFICACY PLAY A ROLE?

by

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Abstract

This study sought to examine the relations between sports participation, academic achievement, and self-efficacy in high school students. Self-efficacy has been linked to both sports participation and academic achievement, but no study has examined these three variables together. One hundred eleven students from two schools filled out surveys examining their levels of sports participation, academic and athletic self-efficacy, and demographic information. Participating schools provided student GPA information. Results supported the study’s first, second, and third hypotheses. Athletes had higher GPAs and academic self-efficacy scores than non-athletes. Additionally, there was evidence for an indirect effect of sports participation on GPA through the mediating variable of academic self-efficacy. Results did not support the study’s fourth hypothesis, as there was no significant relation between academic self-efficacy and athletic self-efficacy among athletes in the present study. Results are discussed in relation to the student population and school environment.
Chapter 1: Introduction

This chapter will cover general research findings pertaining to sports participation, academic achievement, and self-efficacy. This chapter also includes the purpose of the study, research questions addressed in the study, hypotheses associated with each of the questions, and definitions of significant terms.

Test-driven educators are continually seeking ways to bolster academic achievement. The No Child Left Behind (NCLB) Act has had several major effects on American education. Some of these effects include a greater focus on the alignment of curriculum and instruction, students taking more tests, and closer analysis of test score data. Additionally, more attention is now directed at achievement gaps between particular groups of students, such as traditionally underperforming groups of students from low-income families, ethnic and racial minorities, and those learning English (Jennings & Rentner, 2006).

The relations between sports participation and academic achievement have various theoretical underpinnings. On an informal level, there are many individuals who claim to have achieved various successes related to academic achievement as a result of formative sports experiences. From a research perspective, there is considerable evidence that sports participation positively relates to academic achievement among youth (Gerber, 1996; Stegman & Stephens, 2000; Stephens & Schaban, 2002).

The sports context is an important setting in the lives of youth. Over 47 million youth participate in organized sports (Ewing & Seedfelt, 2002). Since sports are a meaningful context in which many young people participate, youth sports teams may be a viable way in which to promote optimal development. Research exists suggesting the
value of consciously designed sports programs for positive youth development (Fraser-
Thomas, Cote, & Deakin, 2007). Positive Youth Development refers to the acquisition of
competencies and skills needed for optimal youth development that continues into
adulthood. These assets include cognitive, social, emotional, and intellectual
competencies, such as confidence, character, or perseverance. Sports teams provide
various advantages for optimal development, including a high level of enjoyment and
challenge, ample opportunities to develop positive relationships, and fulfilling a need to
belong (Heilman, 2011). The relations between sports participation and academic
achievement may be a byproduct of this phenomenon.

Given the increased emphasis on student achievement within schools, and the
wide availability of sports programs for youth, understanding the mechanisms through
which sports participation might promote academic achievement is an important area of
research. One variable that may relate to both sports participation and academic
achievement is self-efficacy. Self-efficacy is defined as beliefs about one’s ability to
successfully execute a behavior required to produce a certain outcome (Bandura, 1997).
The contribution of self-efficacy to academic achievement is well developed in the
literature (Gore, 2006; Pajares, 1996; Richardson, Abraham, & Bond, 2012).
Considerable evidence also exists for relations between sports participation and self-
efficacy (Cetinkalp & Turksoy, 2011; Heilman, 2011). Given these relations, it is
reasonable to hypothesize that the relation between sports participation and academic
achievement may be influenced by the mediating variable of self-efficacy. In other
words, sports participation might increase self-efficacy, which could in turn increase
academic achievement. However, a comprehensive review of the literature did not reveal
any studies that have examined these three variables together. The current study
contributes to the literature by examining sports participation, academic achievement, and
self-efficacy among high school students in a Southwest city.

Understanding the relations between participation in sports and academic
achievement is important for many reasons. These data could play a role in answering
questions about the amount of money, time, and personnel that should be devoted to
sports programs. For teachers and school psychologists, understanding the potential
benefits of sports participation is of great value. If participation is related to academic
achievement, then student athletes should be encouraged and supported to continue sports
rather than viewed as being distracted from their studies. If there is an association
between sports participation and academic achievement, understanding the mechanisms
underlying this association can provide further valuable information.

Research Questions

The current study contributes to the literature by examining sports participation,
academic achievement, and self-efficacy among high school students in a Southwestern
city. The purpose of this study is to examine the link between sports participation,
academic achievement, and self-efficacy.

This study aims to answer the following research questions:

1. Are there significant differences in Grade Point Average (GPA) between athletes
and non-athletes? Hypothesis 1: Students who participate in sports will have
higher GPAs than students who do not participate in sports.

2. Is academic self-efficacy related to sports participation and academic
achievement? Hypothesis 2A: Students who participate in sports will have higher
academic self-efficacy scores than students who do not participate in sports.

*Hypothesis 2B:* Students who score higher on a measure of academic self-efficacy will also have higher GPAs.

3. Does self-efficacy partially mediate the relations between sports participation and academic achievement? *Hypothesis 3:* Academic self-efficacy will partially mediate the relations between sports participation and GPA values.

4. For athletes, is athletic self-efficacy related to academic self-efficacy? *Hypothesis 4:* Athletes who score higher on a measure of athletic self-efficacy will also score higher on a measure of academic self-efficacy.

**Definition of Terms**

Several terms are used throughout this dissertation. Based on the literature, the main terms are defined as follows:

**Academic Achievement** refers to excellence across academic disciplines. In the present study, this will be measured using each student’s GPA. As GPA increases, so does academic achievement.

**Adolescence** refers to the period from 13 years of age through 18 years of age.

**Athlete** refers to a student who reports participation in at least one organized sports program (Stephens & Schaban, 2002).

**Academic self-efficacy** refers to one’s confidence to perform typical academic behaviors, master different areas of coursework, and structure environments conducive to learning (Bandura, 1997; Zimmerman, 2002).

**Athletic self-efficacy** refers to one’s confidence in their ability to be successful in their chosen sport (Vealey, 1986).
General self-efficacy refers to global confidence in one’s ability across a wide range of demanding and novel situations (Kvarme et al., 2009).

Non-Athlete refers to a student who does not participate in at least one organized sports program (Stephens & Schaban, 2002).

Organized sport programs refers to community or school-based programs that provide coaching, supervision, proper equipment, and safety rules, but they may also create expectations that exceed a young person’s stage of growth and maturation, which may hinder one’s ability to participate in sport (see Heilman, 2011).

Self-efficacy refers to beliefs about one’s ability to successfully execute a behavior required to produce a certain outcome (Bandura, 1997).

Sports participation refers to a student participating in at least one organized sport program (Stephens & Schaban, 2002), either at school or within the community.
Chapter 2: Literature Review

This chapter provides a review of relevant literature, beginning with research examining the relations between sports participation and academic achievement. Following this, there is a general discussion of self-efficacy, including research suggesting that self-efficacy beliefs can be transferred across domains (e.g. increased athletic self-efficacy could relate to increased academic self-efficacy). The next section addresses the relations between self-efficacy and academic achievement, followed by the relations between self-efficacy and sports participation.

Sports Participation Among Youth

History. During the past century, organized youth sports have become an integral part of American culture. The beginning of the youth sports movement dates back to the early 1900s, when it was recognized that physical activity was an important part of education (Smoll & Smith, 2002). Sports programs began as after-school recreation activities, but soon acquired a highly competitive orientation. Over time, a host of local and national agencies took over sponsorship and control of some sports, and a wide array of sport programs grew in scope and popularity (Smoll & Smith, 2002). Today, students participate in various types of organized sports programs. These can be divided into two main categories: team sports in which youth compete together, and individual sports in which participants compete as individuals. The most common team sports among youth include basketball, football, and soccer, and the most common individual sports include running and swimming (Sabo & Veliz, 2008).

The belief that participation in sports provides many benefits for youth is long standing. As noted earlier, sports are valued as an important contributing factor to
positive youth development. As Larson (2000) explained, sports teams and other structured voluntary activities may contribute to positive youth development by increasing the capacity for initiative among youth. Initiative is necessary for adolescents to motivate themselves and take action in their daily lives, but is not easy to obtain through schoolwork or by spending time with friends. Larson (2000) interviewed adolescents and found that they described school as challenging, but reported low intrinsic motivation and high rates of boredom during schoolwork. In contrast, adolescents had high intrinsic motivation to participate in leisure activities such as watching television, but did not find such activities challenging.

Given that a large amount of adolescents’ time is being spent in these two opposing situations, sports teams provide the unique opportunity to participate in something for which the adolescent might experience both intrinsic motivation and find challenging. In his interviews, Larson (2000) found that adolescents reporting feeling both challenged and motivated during sports and other hobbies. The presence of intrinsic motivation and concerted engagement allowed adolescents to experience directing and regulating their own action in pursuit of a goal. This allows for “mastery experiences,” one of the most common sources of self-efficacy (Bandura, 1997). Additionally, time spent with peers on organized sports teams allows for two other contributing factors to self-efficacy: social persuasion and vicarious learning (Bandura, 1997). Self-efficacy is related to both sports participation and academic achievement, and there is evidence that it can be transferred between contexts (Cervone, 2000). Sources of self-efficacy and its generalizability will be discussed further in the self-efficacy section.
Although Larson’s research focused on sports and other voluntary activities, it is worth noting that sports are the most frequently participated activity among the category of voluntary activities, accounting for 4-6 hours per week of United States’ adolescents’ time. Other activities, including art, music, and hobbies, only account for 1-2 hours per week (Larson, 2000). The increased amount of time dedicated to sports in comparison to other activities suggests there are more chances for adolescents to develop mastery experiences, initiative, and self-efficacy within the sporting context. Additionally, sports offer the advantage of physical activity. As will be discussed further, considerable research exists documenting a relation between physical activity and academic achievement. Additionally, there is some evidence that school-based sports participation may foster identification with schools and school related values, including performing well academically (Marsh & Kleitman, 2003). Hence, sports provide multiple avenues through which adolescents might improve their academic achievement.

**Demographics and sports participation.** Although many youth participate in sports, there is evidence for disproportionate representation among certain groups of students. For example, Johnston, Delva, and O’Malley (2006) used nationally representative data from over 500 schools and 54,000 students to determine rates of sports participation among different subgroups. The authors found that only a fraction of students participate in varsity sports during the school year, with girls participating only slightly less than boys (33% v. 37%). Participation also correlated negatively with socioeconomic status (SES) and was lower among Black and Hispanic students than White students. Given the various positive outcomes related to sports participation, it is important to note the differences in sports participation among subgroups. If certain
subgroups are underperforming academically and also participating less in sports, increased sports participation may help bridge this achievement gap.

Additionally, it is important to note the differences in the sports environment between age groups. The sports environment is a dynamic one that undergoes noteworthy changes over the adolescent years. Smoll and Smith (2002) noted that membership on athletic teams gets increasingly more selective as adolescents get older, when students are often required to try out for sports teams rather than being automatically admitted. This increasing selectivity comes with an increase in training demands and more regimented participation for athletes. For this reason, researchers studying outcomes of sports participation should be aware that findings from one age group may not apply to other age groups.

Sports Participation and Academic Achievement

Physical activity. All organized sports allow youth the opportunity for physical activity. Considerable research exists documenting a positive relation between levels of physical activity and academic achievement. This research varies from correlational studies documenting positive relations between self-reported levels of physical activity and academic performance (Morales et al., 2011; Stevens, To, Stevenson, and Lochbaum, 2008), to longitudinal studies demonstrating improved grades after physical activity interventions among student populations over several years (Shephard, 1997). Evidence from longitudinal studies suggests that children will not suffer academically even if they spend over an hour of in-school time doing physical activity (Ahamed et al, 2007; Dwyer, Coonan, Leitch, Hetzel, & Baghurst, 1983; Sallis et al, 1999).
Several researchers have sought to explain the mechanisms by which physical activity may increase academic achievement. A recent review of the effects of physical activity on children’s intelligence, cognition, and academic achievement revealed beneficial effects of physical activity on the brain. Results of several cross-sectional studies indicated that children who are physically fit perform cognitive tasks more rapidly and display patterns of neurophysiological activity indicative of greater mobilization of brain resources than do less fit children. Additionally, there is evidence that exercise training improves children’s performance on tests of executive functioning, which are the processes required to initiate goal-directed action (see Tomporowski, Davis, Miller, & Naglieri, 2007 for review). Taken together, these studies suggest that fitness gleaned from physical activity may help children perform academically.

The above findings are important in light of the substantial pressure on students, teachers, and administrators maximize academic performance, which has made it difficult for school administrators to devote time to school-based physical activity. Additionally, the findings address the perception that time spent on nonacademic pursuits negatively impacts children’s performance in school (Ahamed et al., 2007). Finally, the findings suggest that the physical activity provided by organized sports participation may contribute to an increase in academic achievement.

**Sports participation.** In addition to the opportunity for physical activity, organized sports may offer additional benefits that help students succeed academically. Several studies have specifically examined the relationship between sports participation and academic achievement. There is evidence from these studies that athletes who have higher levels of sports participation outperform lower participation athletes and non-
athletes in measures such as overall GPA, math GPA, and class rank. Findings span both the middle and high school levels (Stegman & Stephens, 2000; Stevens & Schaban, 2002).

In addition to improved grades, research has shown that sports participation is related to positive feelings about school, such as looking forward to core curriculum classes. Additionally, sports participation is related to a decrease in school-related social conduct problems such as fighting and misbehaving (Braddock, Royster, Winfield, & Hawkins, 1991).

Examining sports participation in relation to GPA and behavioral characteristics includes a risk of various confounding variables, such as socioeconomic status (SES), race, and parents’ educational attainment. Studies have controlled for these variables, finding that sports participation still predicted GPAs and standardized test scores among high school students (Cooper, Valentine, Nye, & Lindsay, 1999). In addition to demographic factors, the opportunity for physical activity may be a confounding variable between sports participation and academic achievement. However, there is evidence that even after controlling for physical activity, sports participation uniquely contributes to GPA among high school students (Fox, Barr-Anderson, Neumark-Sztainer, & Wall, 2010).

Although correlational studies such as the ones described above demonstrate a relation between sports participation and academic achievement, the possibility exists that athletes had higher levels of achievement prior to beginning sports programs. Longitudinal studies provide an interesting lens through which to view the effects of sports participation on academic achievement. A study that followed students through...
several years showed similar effects of sports participation on academic achievement (athletes had higher GPAs than non-athletes) and attitudes towards school (sports participants liked school more than non-participants), even after controlling for parental education and prior achievement (Eccles, Barber, Stone, & Hunt, 2003). Further longitudinal research found more positive characteristics associated with sports participation: A multiple regression analysis revealed that elite athletes were more likely to have completed postgraduate education, to be employed, and to have high income, even after controlling for sex, ethnicity, SES, and academic grades (Carlson, Scott, Plany, & Thompson, 2005).

Taken together, these studies suggest that participation in sports contributes to higher levels of academic achievement at various grade levels. In addition to physical activity, sports may offer opportunities for self-efficacy development. There is evidence that the self-efficacy developed through sports may be transferable the academic domain. The construct and generalizability of self-efficacy will be discussed further in the following section.

**Self-Efficacy**

Self-efficacy refers to beliefs in one’s capabilities to organize and execute the courses of action required to produce given attainments (Bandura, 1997). An individual’s perceived self-efficacy is believed to affect behavior in various ways. First, perceived efficacy influences the choices individuals make and the courses of action they pursue. People engage in tasks in which they feel competent and avoid those in which they do not. Self-beliefs determine how much effort people will expend on an activity, how long they will persevere when confronting obstacles, and their resiliency in the face of adverse
situations. As one’s efficacy increases, their effort, persistence, and resilience increase as well (Pajares, 1996).

Pajares (1996) also noted that efficacy beliefs influence individuals’ thought patterns and emotional reactions. People with low self-efficacy may underestimate their abilities, which can foster stress, depression, and less creativity in problem solving. Those with high self-efficacy, by contrast, are likely to feel calmer in approaching difficult tasks and activities. These influences make self-efficacy beliefs strong determinants and predictors of an individual’s accomplishments.

**Sources of self-efficacy.** Self-efficacy is developed by four main sources of influence. The most prominent of these influences is mastery experiences (Bandura, 1997). A resilient sense of efficacy requires experience in overcoming obstacles through perseverance. The second major source of efficacy influence is though vicarious experiences provided by social models. Seeing people similar to oneself succeed raises an observers’ belief that he/she too can achieve comparable successes. Social persuasion is the third way of strengthening one’s self-efficacy. People who are persuaded that they can be successful are likely to put forth greater effort than those who have self-doubts. Finally, people rely on somatic and emotional states as a fourth source of self-efficacy. For example, in activities involving strength and stamina, people judge levels of fatigue as a sign of ability. Similarly, mood also affects people’s judgments of their personal efficacy (Bandura, 1997; Pajares, 2002).

**Measuring self-efficacy.** There are various ways to measure self-efficacy. These range from transsituational measures of “generalized self-efficacy” (e.g. Sherer, 1982) to measures that closely correspond to the criterial task with which they are compared, such
as an Academic Self-Efficacy Scale (e.g. Corb, 1996). Findings on the measurement of self-efficacy coincide on two points: When efficacy beliefs are globally assessed and/or do not correspond with the criterial tasks with which they are compared, their predictive value is diminished or can even be nullified. When efficacy assessments are tailored to the criterial task, prediction is enhanced (Pajares, 1996).

**Developmental perspectives.** From Bandura’s (1997) developmental perspective, a newborn arrives without any sense of self, let alone self-efficacy. A sense of self is constructed through transactional experiences with the environment, through which infants also gain a conception of personal agency. For example, adults can foster infants’ sense of personal agency by providing them with objects within their manipulatory capabilities to activate what the objects can do. Understanding language accelerates self-recognition and development of personal agency, as evidenced by the self-referent labels infants apply to themselves by about 18 months (see Bandura, 1997).

There is significant evidence for the role of family in promoting self-efficacy. As Bandura (1997) noted, the level of efficacy-promoting influences in the home environment explains the majority of the relationship between socioeconomic background and children’s cognitive functioning. In one study, for example, family socioeconomic status had only an indirect effect on children’s perceived efficacy by raising parental educational aspirations and belief in their efficacy to promote children’s academic development (Bandura, Barbaranelli, Caprara, & Pastorelli, 2001). The influence of family is a bi-directional relationship: Parental enabling activities increase infants’ exploratory competence and infant capabilities, which in turn elicit greater parental responsiveness.
Although initial efficacy experiences are centered in the family, peers assume an increasingly important role in self-efficacy development as children’s social experiences expand. Peers serve various efficacy functions. Competent peers provide models of efficacious styles of thinking. Social learning occurs among peers, and peers provide the most informative points of reference for comparative efficacy appraisal and verification. As most children get older, schools also function as the primary setting for the cultivation of capabilities. Schools allow children to develop a sense of intellectual efficacy through mastery of cognitive skills, as well as to develop self-regulatory capabilities that allow them to educate themselves. Schools can also promote health efficacy practices and social efficacy. As Bandura (1997), noted, however, schools can also foster inefficacy. For example, grouping students of lower ability levels by grouping into lower academic tracks might contribute to inefficacy.

As children reach adolescence, they enter an important transitional phase in which they begin to consider seriously what they want to do with their lives. The way in which adolescents develop and exercise personal efficacy during this period can play a key role in setting their life course. The more adolescents are able to build mastery experiences through school, extracurricular activities, and social events, the better equipped they will be to handle the challenges of this time period (Bandura, 1997).

Research supports Bandura’s perspective that self-efficacy develops over time through different influences. For example, there is evidence that self-efficacy beliefs do not predict behavior consistently across development. Rather, these beliefs become more strongly related to behavior as children grow older (Davis-Kean et al., 2008). This
suggests that the accuracy of self-efficacy perceptions is not innate but rather strengthens over time.

**Cultural perspectives.** Although some have argued that efficacy beliefs are solely important in Western individualist cultures, research has attested to the cultural universality of efficacy beliefs (see Bandura, 1997). The belief in one’s ability to produce desired effects fosters accomplishments in all cultures. However, different cultural values and practices influence the development of efficacy beliefs, and the way these beliefs are exercised. One common distinction is that of individualist versus collectivist cultures. Individualist cultures favor self-initiative and the pursuit of self-interest, whereas collectivist cultures value group interest above individual pursuits. Bandura (1997) suggested those in individualist cultures might be most efficacious when able to manage things themselves, whereas those in collectivist cultures when they can manage things together. There is empirical support for this idea. For example, Earley’s (1994) research provides insight into how efficacy beliefs are altered and function in divergent cultures. He provided managers from different cultures with preset diagnostic information that either they personally or their group possessed the attributes needed to perform a given managerial activity well. As predicted, results showed that managers from an individualistic culture exhibited higher efficacy beliefs and productivity gains when the efficacy-boosting influence was individually oriented, whereas those from collectivist cultures achieved higher gains in perceived efficacy when the influence was group oriented. Despite these differences, efficacy beliefs are important to the success of both types of cultures.
**Individual differences.** It is worth noting the evidence for individual differences in self-efficacy development present in the literature. While the main sources of self-efficacy, such as mastery experiences, are applicable to wide groups of people, these experiences impact individuals’ self-efficacy development at different levels. For example, there is evidence that individuals higher in positive affectivity have a greater increase in self-efficacy as a result of a training program than individuals lower in positive affectivity (Gerhardt & Brown, 2006).

**Types of self-efficacy.** Since self-efficacy is typically measured in a task-specific manner, there are various types of this construct discussed in the literature. The present study focuses on two types of self-efficacy. Academic self-efficacy refers to one’s confidence in their ability to perform typical academic behaviors, such as focusing while doing homework. Additionally, it measures one’s confidence in their ability to master different areas of coursework. Researchers have correlated various measures of academic self-efficacy with academic achievement, which will be discussed further. In the present study, athletic self-efficacy refers to one’s confidence in their ability to be successful in their chosen sport. Although it is typically measured in a task-specific manner, there is evidence that the self-efficacy gained in one domain is transferable to other domains (Cervone, 2000). Hence, student athletes who gain self-efficacy in sports may also have higher self-efficacy in the academic arena. The generalizability of self-efficacy will be discussed further in the following section.

**Transfer of self-efficacy across domains.** The question of whether self-efficacy perceptions are narrow, situation-specific expectations, or whether people’s beliefs in their capabilities generalize broadly across contexts is an important one. Cervone (2000)
addressed this question by asking (1) How people think about their efficacy for
performance; and (2) What cognitive processes and structures might foster cross-
situational coherence in self-efficacy appraisal? As Cervone (2000) noted, a useful
heuristic is to distinguish between knowledge and appraisal as aspects of cognition.
Appraisal refers to evaluations of a particular encounter, whereas knowledge refers to
general beliefs about one’s characteristics of the environment. Using this framework,
self-efficacy perceptions are appraisals of the level or type of performance one can
achieve in a given encounter. These appraisals may be shaped by underlying knowledge,
especially knowledge of one’s enduring characteristics. This self-knowledge might come
to mind and shape self-efficacy appraisals in a variety of contexts. Thus, cross-
situational generalization of self-efficacy may be derived from highly accessible self-
knowledge structures (Cervone, 2000).

Using the aforementioned premises, Cervone (2000) investigated cross-situational
coherence in self-efficacy by examining self-schemas and situational beliefs that underlie
cross-situational generalization in self-efficacy appraisal. In an initial experimental
session, three personal attributes for which each individual is schematic were identified.
A second experimental session then assessed participants’ situational beliefs. During this
session, the author and colleagues judged the degree to which each of participants’ three
schematic attributes was relevant to a wide variety of social, interpersonal, and
achievement situations. They also assessed their situational beliefs regarding two
generic, “experimenter-provided attributes” which served as an internal experimental
control. Two weeks later, participants completed a multi-domain self-efficacy
questionnaire. As predicted, participants appraised themselves as having consistently
higher efficacy for performance across sets of situations that related to personal
“positive” characteristics of importance to them. This suggests that situational
knowledge and self-knowledge jointly created cross-situational generalization in self-
efficacy perception. Generalization was not found with the control condition of
experimenter-provided traits.

Cervone’s research on the transfer of self-efficacy across domains is supported by
Bandura’s (1997) identification of several generalizability processes that allow self-
efficacy to transfer between domains. These processes include generalizability through
activities with similar subskills, generalizability through activities that share a category of
action, and the transformational restructuring of efficacy beliefs through mastery
experiences (Samuels & Gibb, 2002). As Simons, Van Rhee, and Covington (1999)
noted, athletic success requires an individual to work hard, be self-disciplined, exhibit
perseverance and determination, be able to concentrate, stay focused, and so forth. These
qualities also enhance academic success. Thus, it is feasible to hypothesize that self-
efficacy beliefs from a sports setting could be transferable to the school setting. Student-
athletes may be able to apply self-efficacy appraisals learned through interscholastic
sports to the academic domain. Samuels and Gibb (2002) found evidence for the
generalizability of self-efficacy from the physical domain to an unrelated area. In their
study, Air Force Cadets enrolled in mandatory boxing classes experienced increases in
physical self-efficacy and in the disparate domain of leadership initiative self-efficacy.

**Sports participation and self-efficacy.** Sports programs potentially offer all of
the main sources of self-efficacy. These programs offer athletes the opportunity to work
towards goals. Achieving these goals might be a mastery experience for the individual
athlete, raising his/her self-efficacy. There is evidence that young athletes who practice mastery imagery have higher levels of both self-confidence and self-efficacy in their chosen sport (Munroe-Chandler, Hall, & Fishburne, 2008).

Additionally, the social supports offered by caring coaches and teammates may contribute to self-efficacy among youth. These supports might increase self-efficacy through two main sources: social models and social persuasion. Cetinkalp and Turksoy (2011) also found that general self-efficacy was related to team affiliation among soccer players, which is a variable measuring one’s motivation to participate in sports. Heilman (2011) examined the relations between self-efficacy and perceptions of their sport climate in boys and girls on nine alpine ski racing teams across the United States, finding athletes’ positive perceptions of a caring climate significantly predicted general self-efficacy. In a similar study, Gano-Overway and colleagues (2009) examined efficacy related beliefs in multiethnic youths taking part in summer sports programs. Findings revealed that perceptions of caring positively predicted both efficacy beliefs.

The fourth main source of self-efficacy, somatic states, can be promoted through the physical activity provided in organized sports programs. Several studies have related levels of physical activity to self-efficacy. Kvarme and colleagues (2009) found that general self-efficacy was significantly related to health related quality of life (HRQOL) among seventh graders across eastern Norway. Within the HRQOL, physical well-being was also significantly associated with self-efficacy. Another study found that self-efficacy for physical activity partially mediated the relations between perceived barriers to physical activity (such as lack of time and feeling tired) and levels of physical activity among alternative high school students (Kenyon, Kubik, Davey, Sirard, & Fulkerson,
In a study examining physical activity in high school girls, researchers found that girls who perceived strong social support had less of a decline in physical activity if they also had high self-efficacy (Dishman, Saunders, Motl, Dowda, & Pate, 2009), suggesting a relation between the main sources of social supports and somatic states in developing self-efficacy.

Taken together, these results suggest that organized sports programs might foster self-efficacy through a variety of ways, including the main sources of mastery experiences, social supports, social persuasion, and somatic states.

**Self-efficacy and academic achievement.** In addition to having a relation with sports, self-efficacy beliefs have been explored as possible predictors of students’ academic success. In a recent meta-analysis of relations between fifty measures and academic achievement, medium size correlations were found between academic self-efficacy and GPA among high school students. Interestingly, the largest correlation of the fifty measures examined was a student’s performance self-efficacy, which is a more specific academic self-efficacy measure that asks students the highest GPA they believe they can attain (Richardson, 2012). These results demonstrate evidence for relations between self-efficacy and performance, as well as the value of closely tailoring self-efficacy questions to the criterial task. Even when comparing to covariates such as gender, SES, and race, evidence for the relations between self-efficacy and academic achievement among high school students remains strong (Lucio, Hunt, & Bornovalova, 2011).

In addition to examining self-efficacy and achievement at the high school level, researchers have explored these variables at the college level with similar results. Several
early studies focused on the role of academic self-efficacy beliefs in predicting the performance and persistence in science and engineering fields (Brown, Lent, & Larkin, 1989; Lent, Brown, & Larkin, 1986, 1987). Findings from these studies were generally consistent, suggesting that academic self-efficacy beliefs are related to college performance, college persistence, and perceived career options. More generally, Multon, Brown, and Lent (1991) conducted an early meta-analysis of the relationships between students’ self-efficacy beliefs for academic tasks and their performance and persistence in school. Their findings suggested that between 11% and 14% of the variance in academic performance and persistence could be accounted for by an individual’s academic self-efficacy beliefs. Each of these studies also demonstrated how self-efficacy beliefs could account for variance in college performance and persistence beyond that accounted for by more traditional predictors, such as standardized achievement and aptitude measures.

Also at the college level, Gore (2006) found that academic self-efficacy beliefs predicted academic achievement, but that this relationship was only strong when self-efficacy was measured at the end of the college semester. This relation between self-efficacy beliefs and college experience is evidence for the reciprocal nature of self-efficacy beliefs and the individual’s environment. At the beginning of the college semester, the students had not received enough feedback from their environment (e.g. through test scores and professor feedback) to accurately assess how well they would achieve in college. By the end of the semester, this feedback had enabled them to develop more accurate self-efficacy beliefs. Thus, researchers examining self-efficacy should be sure to measure the construct after an individual has had enough experience to accurately assess their abilities.
While the above studies demonstrate a link between self-efficacy and academic achievement, researchers have also focused on the mechanisms through which these two constructs may be related. Diseth, Danielson, and Samdal (2012) examined teachers’ support of psychological needs, self-efficacy, and achievement goals among secondary students in Norway. The authors found that basic needs support predicted self-efficacy, which in turn predicted academic achievement. These relations are important to note, as self-efficacy beliefs can be influenced not only by one’s environment (e.g., school or sports team), but also by the culture within that environment. A school with caring teachers, or a sports team with strong social supports, for example, might foster efficacy related beliefs more strongly than similar environments without such supports.

Taken together, the above studies demonstrate evidence for the relations between self-efficacy and academic achievement. These relations are evidenced by correlations between self-efficacy and GPA among high school and college students, as well as by correlations between self-efficacy and persistence in school. These relations may be affected by various factors, including how far along students are in the semester and whether or not they are receiving teacher support. This research, in conjunction with research suggesting that sports participation is related to efficacy beliefs, is the basis for the present study examining sports participation, self-efficacy, and academic achievement among high school students.
Chapter 3: Method

Participants

Participants were 111 students from two high schools in Tucson, Arizona. Students were eligible for inclusion in the study if they were attending one of the two high schools in the study and had consent of their parents. High school students were targeted for this study because membership on sports teams gets increasingly selective as youth get older, and participation more demanding and regimented. Hence, sports arguably offer more opportunities for mastery experiences at this age. For the total sample, participants ranged from 14 to 18 years of age, with the majority of respondents between the ages of 15-17 and in their second, third, or fourth year of high school. An a priori power analysis was conducted to estimate minimum sample size to conduct an independent samples T-test. Using a two-tailed t-test with an alpha of .05, and power of .8, and effect size of 0.5, total sample size was 128 participants, with 64 participants in each group. Sixty-four of the study’s participants identified themselves as athletes, and 44 identified themselves as non-athletes. In addition, 52 of the study’s respondents indicated that they participated in a non-sport extracurricular activity. Thirty-one participants indicated that they participated in both organized sports and a non-sport extracurricular activity. The current sample consisted of 54 males and 55 females. The first set of participants (n=45) came from school 1, a private college-preparatory high school, and 33 of these students were athletes. Approximately 150 students were recruited for participation at school 1, yielding a 30% response rate. School 1 offers multiple levels of various sports (e.g. Varsity, Junior Varsity) throughout the year. Interscholastic offerings include boys' soccer, boys' and girls' swimming, girls' volleyball,
girls' golf, boys' and girls' cross country in the fall; girls' soccer, boys' and girls' basketball in the winter; and boys' golf, baseball, softball, and boys' and girls' tennis in the spring.

Due to a lack of power from the first sample, the primary investigator recruited a second set of participants from school 2. School 2 is a public high school, and contributed 66 participants to the sample. Approximately 600 students were recruited for participation at school 2, yielding an 11% response rate. Thirty-one of the 66 participants at school 2 were athletes. School 2 offers the following sports programs: Football, swimming, cross country, volleyball, soccer, wrestling, basketball, tennis, track and field, volleyball, softball, and baseball. Athletes in the study reported participating in a variety of sports. The most common sports represented in the study were soccer ($n=15$), tennis ($n=10$), basketball ($n=9$), baseball ($n=9$), and softball ($n=8$). Other sports included volleyball, ($n=7$), golf ($n=4$), swimming ($n=4$), wrestling ($n=4$), and football ($n=3$). Some participants reported participating in sports that were not offered at their school, such as bike racing ($n=1$), crossfit ($n=1$), and yoga ($n=2$). Athletes did not differ significantly from non-athletes in the sample on measures of gender BMI, SES, Race/Ethnicity, and Parental Education, but the two groups differed significantly on a measure of weekly physical activity. See table 1 for a comparison of athletes and non-athletes in this study.
Table 1. Demographic Comparisons Between Athletes and Non-Athletes

<table>
<thead>
<tr>
<th>Measure</th>
<th>Athlete (n = 64)</th>
<th>Non-Athlete (n = 44)</th>
<th>t value</th>
<th>$\chi^2$ value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean SES</td>
<td>$43,814 (17,525)$</td>
<td>$38,375 (15,760)$</td>
<td>1.65</td>
<td>-</td>
<td>.10</td>
</tr>
<tr>
<td>Mean Days Weekly Physical Activity</td>
<td>5.02 (1.63)</td>
<td>4.03 (1.89)</td>
<td>2.66</td>
<td>-</td>
<td>.01*</td>
</tr>
<tr>
<td>Mean BMI Percentile</td>
<td>61.17 (27.90)</td>
<td>61.20 (32.33)</td>
<td>.00</td>
<td>-</td>
<td>.99</td>
</tr>
<tr>
<td>% Female</td>
<td>48</td>
<td>55</td>
<td>-</td>
<td>.39</td>
<td>.53</td>
</tr>
<tr>
<td>% with mothers having college degree</td>
<td>60</td>
<td>45</td>
<td>-</td>
<td>4.33</td>
<td>.22</td>
</tr>
<tr>
<td>% Identified Hispanic/Latino</td>
<td>49</td>
<td>68</td>
<td>-</td>
<td>3.62</td>
<td>.06</td>
</tr>
</tbody>
</table>

*Difference between groups significant at the .05 level, $d = .55$

Standard deviations provided in parentheses.

**Measures**

**Academic achievement.** To assess academic achievement, students’ current, cumulative GPAs were obtained from school records. GPAs were automatically computed by each school’s online records.

**Academic self-efficacy.** The measure of academic self-efficacy was adapted from Bandura’s (1989) Multidimensional Self-Efficacy Scales. Perceived efficacy for academic achievement measured participants’ belief in their capabilities to master different areas of coursework, including mathematics, science, biology, reading and writing language skills, computer skills, and social studies. A second set of scales measured perceived efficacy for self-regulated learning. Specifically, these scales...
assessed student’s efficacy to structure environments conducive to learning, to plan and organize their academic activities, to use cognitive strategies to enhance understanding, to obtain information and get help when needed, and to motivate themselves to do their schoolwork (see Appendix A). When using these two subscales with high school students, Zimmerman et al. (1992) reported reliability coefficients (Cronbach’s alpha) of .87 for the self-regulated learning sub-scale and .70 for the academic achievement sub-scale. For the current sample, the Cronbach Alpha was .87 for the combined scales.

**Athletic self-efficacy.** Athletic self-efficacy was assessed using Vealey’s (1986) Trait Sport Confidence Inventory. Drawing on self-efficacy theory, The Trait Sport Confidence Inventory measures how confident athletes generally feel when they compete in their sport. It consists of 13 items that are summed together to form an indicator of self-confidence. The athletes were instructed to compare their self-confidence with the most self-confident athlete they know and then rate themselves on a 9-point scale (see Appendix B). Vealey (1986) carried out validation procedures that indicated that the questionnaire is a unidimensional measure with adequate internal consistency (alpha = 0.93), test-retest reliability ($r = 0.86$), content and concurrent validity. For the current sample, the Cronbach’s alpha was 0.96.

**Sport participation.** To examine sports participation, a survey designed by the researcher (see Appendix C) asked students to indicate whether they currently participate in interscholastic and/or organized sports. Each participant was classified as either an athlete or a non-athlete. For this study, an athlete was defined as any student who currently participates in one or more sports, either inside or outside of the school setting. Athletes were asked to list the sport(s) in which they currently participate. A non-athlete
was defined as a student who does not participate in sports. Students were also asked to indicate whether or not they recently played a sport, but stopped participating. Additionally, students were asked about their level of physical activity, whether during organized sports participation or on their own time, with a question modified from the 2010 National Youth Physical Activity and Nutrition Survey (National Youth Physical Activity and Nutrition Survey, 2010). The sports participation questionnaire also included select questions from the School Sleep Habits Survey, a 63-item questionnaire designed to assess the sleep/wake habits, other extracurricular activities, and typical daytime functioning of high school students (“Sleep for Science”, n.d.).

**Demographic information.** To examine potential confounding variables between sports participation and GPA, a demographic information sheet designed by the researcher (see Appendix D) asked students to indicate their date of birth, grade, sex, highest level of education of mother, highest level of education of father, race/ethnicity, height, weight and zip code. Census tract data estimated median household income (SES proxy) based on the participants’ zip code. Body mass index was calculated using the Center for Disease Control’s computational algorithm for children.

**Procedures**

After the University’s Institutional Review Board granted approval of the project and the principal investigator secured permission from the school districts to perform the study, the principal investigator began collecting data. Students were recruited for participation from two high schools in Tucson, Arizona. A consent form and release of information for student records was sent to each parent or legal guardian of recruited students or to students who were over 18. The consent form contained general
information regarding the study, without revealing the specific hypothesis or aims to minimize risk of participant bias. At school 1, students wrote their student identification numbers or their names on the survey and filled out surveys during a school-wide morning meeting. The principal investigator then provided participating students’ identification numbers to the school, and the school principal provided students’ GPAs to the principal investigator. Data collection at school 1 took place at the end of the 2012-2013 school year. At school 2, students wrote their names on the survey and surveys were completed during a non-academic free reading period. The principal investigator was able to access participating students’ GPAs through a district-wide online database. Data collection at school 2 took place at the beginning of the 2013-2014 school year. At both schools, all participants were offered a free kids size “Eegee” gift certificate for their participation.

There were minimal risks associated with participation in this study. Some of the questions in the self-report questionnaire may have evoked a negative response, such as a student realizing they have less confidence in the areas of academics or sports. To address this possibility, students and their parents/guardians were provided with the researcher’s contact information if they had any questions about the study. Results of the study will also be provided to those who ask after the conclusion of the principal investigator’s dissertation defense.
Chapter 4: Results

Although participants from school 1 and school 2 were aggregated together to have enough power to address the hypotheses, they differed in regard to the following variables: percentage of athletes from their samples, GPA, SES, maternal education levels, and ethnicity. See Table 2 for a comparison of measures between schools.

Table 2. Demographic and Other Comparisons Between Schools

<table>
<thead>
<tr>
<th>Measure</th>
<th>School 1 (n = 45)</th>
<th>School 2 (n = 66)</th>
<th>t value</th>
<th>$\chi^2$ value</th>
<th>p value</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of Athletes</td>
<td>73</td>
<td>47</td>
<td>-</td>
<td>6.33</td>
<td>.01*</td>
<td>Cramer’s V = .24</td>
</tr>
<tr>
<td>Mean GPA</td>
<td>3.38 (0.51)</td>
<td>2.36 (0.84)</td>
<td>7.83</td>
<td>-</td>
<td>&lt; .01*</td>
<td>d = 1.47</td>
</tr>
<tr>
<td>Mean SES</td>
<td>$51,806$ (17,936)</td>
<td>$34,055$ (11,479)</td>
<td>5.76</td>
<td>-</td>
<td>&lt; .01*</td>
<td>d = 1.39</td>
</tr>
<tr>
<td>% of mothers having college Degree</td>
<td>93</td>
<td>22</td>
<td>-</td>
<td>54.19</td>
<td>&lt; .01*</td>
<td>Cramer’s V = .74</td>
</tr>
<tr>
<td>% Hispanic/Latino</td>
<td>14</td>
<td>89</td>
<td>-</td>
<td>57.03</td>
<td>&lt; .01*</td>
<td>Cramer’s V = .75</td>
</tr>
</tbody>
</table>

*Difference between groups significant at the .05 level

Standard deviations provided in parentheses.

Research question 1. A t-test was used to test for mean differences in GPA between athletes. A significant difference was found, $t (106) = 2.75, p = .01, d = .70$, indicating that athletes had higher GPAs than non-athletes.

Then, several Pearson correlations were conducted between measures on the demographic survey and GPA. A significant correlation did not exist between levels of physical activity and GPA, $r = .10, p = .35$. Significant correlations existed between GPA and BMI ($r = -.36, p < .01$), SES ($r = -.31, p < .01$), Ethnicity ($r = .50, p < .01$),
Maternal Education, $r = .32, p < .01$, and Paternal Education, $r = .56, p < .01$. When these significant measures were included in a general linear model with sports participation, only paternal education, $F(1, 110) = 3.88, p = .01$, and BMI, $F(1, 110) = 5.70, p = .02$, were found to significantly relate to GPA independently.

**Research question 2.** A t-test was conducted to test for differences in academic self-efficacy between athletes ($M = 106.57, SD = 15.43$) and non-athletes ($M = 100.12, SD = 15.99$). Results indicated that athletes had significantly higher levels of academic self-efficacy than non-athletes, $t(104) = 2.08, p = .04, d = .41$. Then, a Pearson correlation was used to examine whether a relation existed between academic self-efficacy scores and GPA. A significant positive correlation was found ($r = .45, p < .01$) between scores on the academic self-efficacy measure and students’ current GPAs.

**Research question 3.** Research question 3 asked whether self-efficacy would partially mediate the relationship between sports participation and academic achievement. The PROCESS SPSS macro (Hayes, 2013) was used to test for direct and indirect relations among variables simultaneously. Whether academic self-efficacy partially mediated the relationship between sports participation and GPA was tested ($n = 106$). Results did not indicate a significant direct effect of sports participation on GPA ($R^2 = .30, 95\% CI [-.62, .00], p = .06$); however results indicated that an indirect relationship existed between sports participation and academic achievement through the influence of academic self-efficacy, $\Delta R^2 = .03, 95\% CI [-.34, -.03], p < .05$. Thus, academic self-efficacy partially mediates the relationship between sports participation and academic achievement. Figure 1 displays relations among sports participation, academic achievement, and academic self-efficacy.
Figure 1. Mediational Model of Self-Efficacy, Sports Participation, and Academic Achievement. Regression coefficients for the relationship between sports participation and academic achievement as mediated by self-efficacy. The direct effect of sports participation on academic achievement is shown, and the standardized regression coefficient between sports participation and academic achievement when controlling for academic self-efficacy is in parentheses.

*p < .05

In an additional analysis controlling for the influence of covariates including BMI, SES, Ethnicity, Maternal Education, and Paternal Education, the indirect effect of sports participation on GPA attenuated to a degree of non-significance, 95% CI [-.19, .09]. With the inclusion of these covariates, only paternal education ($R^2 = .27, p < .01$) predicted GPA independently.
Research question 4. Research question 4 examined whether athletic self-efficacy was related to academic self-efficacy for athletes. A Pearson correlation was used to examine whether a relation existed between scores on the academic self-efficacy measure and scores on the athletic self-efficacy measure. No significant relation was found between these measures. $r = .10, p = .44$.

Additional Analyses

Although the two schools from which the participants came were pooled together to answer the primary research questions, they were different types of educational settings (e.g., college preparatory versus public high school) and demographic differences existed. Thus, a $t$-test was then used to test for mean differences in GPA between schools. A significant difference, $t(106) = 7.25, p < .001$, existed with there being over a one-point difference in average GPA between schools.

Given the large between-school difference in average GPA, the investigator conducted a chi-square test examining school and sports participation. This test demonstrated these variables as significant, $\chi^2(1, N = 108) = 6.33, p = .01$, with school 1 having a higher percentage of athletes. To further examine between-school differences, a two-way ANOVA was conducted with school and sports participation as the independent variables and GPA as the dependent variable. Results indicated a main effect for school only, $F = 18.38, p < .001$. 
Chapter 5: Discussion

This study had two major aims. First, this study sought to extend previous research indicating a positive link between sports participation and GPA among high school students (Eccles et al., 2003; Stegman & Stephens, 2000). Specifically, this study asked whether mean differences in GPA would exist between athletes and non-athletes. Second, this study sought to explore the relations between sports participation, academic achievement, and self-efficacy among high school students. Although studies had explored relations between sports participation and self-efficacy (Cetinkalp & Turksoy, 2011; Kenyon et al, 2012), and relations between self-efficacy and academic achievement (Lucio, Hunt, & Bornovalova, 2011; Richardson, 2012) as no study had examined these three variables together.

Since self-efficacy is most effectively measured when tailored to its criterial task (Pajares, 1996), this study examined both academic and athletic self-efficacy in relation to GPA and sports participation, respectively. Specifically, this study asked whether academic self-efficacy was related to sports participation and academic achievement. Additionally, given evidence that self-efficacy can be transferred across domains (Cervone, 2000), this study examined whether athletic self-efficacy was related to academic self-efficacy.

High school students were selected for this study because sports are a frequently participated in activity among voluntary activities for adolescents (Larson, 2000), allowing the researcher to compare athletes and non-athletes within the same schools. Additionally, high school students have had more time to develop self-efficacy beliefs
based on reciprocal experiences with their environment (Bandura, 1997), making them a population better suited to explore the relations between self-efficacy and other variables.

**Revisiting hypotheses**

Four major research hypotheses were proposed. The following paragraphs address how the findings supported those hypotheses, implications of those findings, and directions for future research: 1) Athletes would have higher GPAs than non-athletes, 2a) Athletes would have higher levels of academic self-efficacy than non-athletes, 2b) Academic self-efficacy scores would be positively related to GPA, 3) Academic self-efficacy would mediate a relation between sports participation and GPA, and 4) For athletes, athletic self-efficacy scores would be positively related to academic self-efficacy scores.

**Sports participation and academic achievement.** The first hypothesis was that athletes would have higher GPAs than non-athletes. This study supported the first hypothesis. There was a significant difference in mean GPA between athletes and non-athletes, with athletes performing better than non-athletes on this measure of academic achievement. These results are consistent with previous research findings indicating higher GPAs among high school students who participate in sports versus non-athletes (Eccles et al., 2003; Stegman & Stephens, 2000). Results of the present study indicated a medium effect size when comparing the GPAs of athletes versus non-athletes in the study’s population. This difference is meaningful, as athletes had nearly half a point higher average GPA than non-athletes, and were at the high end of the “B” range whereas athletes were at the lowest end of the “B” range (GPA Conversion Chart, n.d.). This difference in average GPA suggests that participation in sports may contribute to
academic achievement nearly a letter grade higher when compared to students who do not participate in sports.

There are several possible explanations for higher GPAs among athletes versus non-athletes in this study. First, the opportunity for physical activity present in organized sports programs may have academic benefits. The present study found a significant difference in physical activity levels between athletes and non-athletes. Several studies have documented a link between exercise and academic achievement in youth (Dwyer et al., 2001; Lindner, 1999; Morales et al., 2011; Stevenson & Lochbaum, 2008). However, given that physical activity on its own was not related to GPA, it is also possible that the physical activity combined with the structure present in organized sports programs helps student-athletes achieve academically. By having less “free time,” these students may be more focused while studying, or have developed superior time management skills in comparison to students with less structured hours in their schedule. Research disputing the “overscheduling hypothesis” is evidence for the positive benefits of a structured schedule for youth (Fredricks, 2012). Additionally, the structure provided by organized sports programs may contribute to self-efficacy development through the opportunities for mastery experiences, vicarious learning, social persuasion, and somatic states. The present study found evidence for an indirect effect of sports participation on academic achievement through academic self-efficacy, and this relationship will be discussed further in the following section.

It is also possible, however, that participation in sports reflects students already having higher academic abilities. Students who are struggling in school may not be allowed or want to spend time away from their studies in order to participate in sports.
Future research may want to examine characteristics of students as they begin participating in organized sports to determine whether previous academic achievement is a factor.

**Sports participation and self-efficacy.** The present study also supported hypothesis 2a; that is athletes had higher academic self-efficacy scores than non-athletes. This study also supported hypothesis 2b, which examined the relation between academic self-efficacy scores and GPA. A significant positive relation was found between these two measures. By finding a positive relation between academic self-efficacy scores and GPA, and by finding an indirect effect of sports participation on GPA through academic self-efficacy, this study extended the existing body of research suggesting that self-efficacy beliefs are positive predictors of students’ academic success (Lucio, Hunt, & Boronvalova, 2011; Richardson, 2012). The positive relation between academic self-efficacy scores in this study suggests that participants had an accurate awareness of their abilities to perform in the school setting. Additionally, the fact that data was collected at the end of the participants’ school year for one group of students, and that the majority of students were at least in their second year of high school, is evidence for the reciprocal nature of self-efficacy beliefs and the individual’s environment. Having already had at least a year of high school may have enabled students to receive enough feedback from their academic environment to develop accurate self-efficacy beliefs. It is possible that if data had been collected earlier in high school, the relation between academic self-efficacy and GPA may have been smaller or insignificant (Gore, 2006).

**Transfer of self-efficacy between domains.** This study’s results also supported hypothesis 3, as academic self-efficacy was found to partially mediate an indirect effect
of sports participation on GPA. These mediation results support the idea that athletes may develop higher levels of self-efficacy as a result of sports participation, and that this self-efficacy may help them perform better academically. This may be due to the opportunities present for self-efficacy development in organized sports programs. Sports provide a unique environment in which participants feel both intrinsically motivated and challenged (Larson, 2000), which make them a unique setting for youth to develop self-efficacy. Sports provide opportunities for all of the main sources of self-efficacy: mastery experiences through competition, vicarious learning and social persuasion through peer models, and somatic states through physical activity.

Despite the above evidence for a relation between sports participation and academic achievement as partially mediated by academic self-efficacy, this study’s results only partially supported the idea that self-efficacy can transfer between the athletic and academic domains. This is because the present study’s results did not support the fourth hypothesis: No significant relation between academic self-efficacy and athletic self-efficacy scores were found. As mentioned in the following section, this may be due to a lack of specificity inherent in the self-efficacy measures used in this study. It is also possible, however, that students who participate in sports may have had higher levels of self-efficacy to begin with, and this confidence made them more likely to participate in sports. The present results also may reflect a lack of self-efficacy transfer between domains. It is possible that student-athletes may compartmentalize their experiences in the classroom and in the sports arena into two distinct domains, and not transfer self-efficacy beliefs between these areas.
Intuitively, the idea that self-efficacy could transfer from the athletic to academic domain is a sound concept. The skills required for success in the athletic realm, such as persistence, are arguably also required for success in the academic setting. However, it is useful to revisit the four main sources of self-efficacy when examining transfer of this concept between domains. These sources include mastery experiences, vicarious learning, social persuasion, and somatic states. The first and largest source of self-efficacy, mastery experiences, is particularly interesting. As noted before, sports are the most frequently participated in activity among adolescents. This widespread participation allows adolescents of all athletic abilities to be involved in sports. It is feasible that those who perform better in their chosen sport (e.g. winning races) glean a greater sense of “mastery” than those who perform at an average or sub-average level. Thus, it is possible that the lack of self-efficacy transfer between the athletic and academic realm is a reflection of the varying performances of athletes in the present study. Perhaps only athletes who are performing above average in their sport are those who transfer athletic self-efficacy to the academic realm. Future studies may want to examine differences in self-efficacy between athletes who are performing at high levels versus those at average or sub-average levels within their sport.

Additionally, several studies have found evidence for a relation between social supports and self-efficacy in youth who participate in sports (Gano-Overway et al., 2009; Heilman, 2011). Thus, it is possible that not all of the athletes in the present study were having a positive social experience in their organized sports program, thus limiting any self-efficacy they might have gained from participation. Future studies in this realm may
want to add a measure of social support when examining the relations between sports participation, academic achievement, and self-efficacy.

**Context of school environment on sports participation and self-efficacy beliefs.** The current study pooled all participants, with the recognition there were some differences between students from the schools. When analyzed separately, athletes did not differ in GPA from non-athletes as a result of being underpowered for each school separately. Nonetheless, it is noteworthy that the present study found a main effect of school when examining between group GPA differences, with school 1 having a significantly higher average GPA than school 2. Similarly, it is worth recognizing that a greater percentage of participants from school 1 were athletes than the percentage of students from school 2. This appears to be proportionate to school 1’s student body, as approximately 70% of students there participate in sports. This difference in proportions suggests that a student’s school environment might influence whether or not they participate in sports. With a smaller student body, opportunities to participate in sports may be more readily available to students at school 1 versus students at school 2. Additionally, it is possible that sports participation is encouraged more at school 1 than at school 2, as 100% of graduates from school 1 attend college following graduation. Sports participation might be looked upon as a favorable resume-builder for students’ college applications at school 1.

Although school 1 may have an increased opportunity for sports participation, it is also possible that the higher socioeconomic background of its student body might contribute to students participating in sports at higher rates. Research has suggested that students from higher socioeconomic backgrounds have more resources for physical
activity participation (Estabrooks, Lee, & Gyurcsik, 2003), and participate in sports at higher levels than students from lower socioeconomic backgrounds (Bengoechea, Sabiston, Ahmed, & Farnoush, 2010). The fact that school 1 and school 2 are demographically different is both a limitation of this study, and possible evidence for the increased access to organized sports programs afforded to students from higher socioeconomic backgrounds. Of course, SES was also correlated with academic achievement, making it difficult to separate the effects of SES and sports participation on academic achievement with the present study’s smaller sample. Although it is impossible to describe the exact relations between school differences in sports programs, student demographics, and academic achievement, the present study suggests that these factors should be considered when considering the results of the present study.

When considering the effect of school context on self-efficacy beliefs in addition to sports participation and academic achievement, it is worth noting that the smaller population of school 1 allows students of all abilities to participate in sports. Students at school 2 likely have to perform at a certain level in order to be included on Varsity teams, and those who do not perform highly enough may be cut from the team. School 1, however, does have rigorous standards for academics, and students who are not performing highly enough are not permitted to attend. The difference in academic and athletic standards for participation at school 1 might explain the relation between academic self-efficacy beliefs and GPA in the present study, and the lack of relation between athletic and academic self-efficacy beliefs. In other words, students at school 1 might have high academic self-efficacy beliefs because they are performing well in school, but their athletic self-efficacy beliefs might be varied depending on whether they
are performing well in sports. Given that school 1 provided nearly half of the athletes in the present study, the remaining population of athletes may have been too small to demonstrate a significant link between academic and athletic self-efficacy.

**Methodological Limitations**

There were several methodological limitations present in this study. This section reviews these limitations, which include a lack of power, the difficulties inherent in measuring self-efficacy, and difficulties encountered when collecting data.

**Sample size and differences.** A priori power analysis was conducted prior to data collection, indicating a minimum sample size of 128 participants for an independent samples t-test, with 64 participants in each group. However, an ideal sample size for this study would arguably have been as high as 200 participants at minimum, allowing for 5-10 observations per variable in the study. The smaller sample size present in this study (N=111) resulted in less power to detect significant differences. Nonetheless, significant results were found with high effect sizes. Additionally, the present study contained participants from two diverse schools. School 1 had students from significantly higher socioeconomic backgrounds, who had parents with higher levels of education, and were less likely to identify themselves as Hispanic or Latino on a measure of ethnicity. When compared to school 2, school 1 also had an average GPA over one-point higher. Given the demographic differences between schools, it is difficult to separate the effects of SES, parental education, and ethnicity on GPA when there was such a large between-school difference. Thus, the between-school difference may have masked the effects of sports participation on GPA when other variables such as SES and parental education levels were included in the analysis.
**Measurement issues.** The present study’s second, third, and fourth hypotheses were centered on the measurement of self-efficacy. As previously mentioned, self-efficacy is a task-specific construct. As Corb (1996) discussed, the tasks deemed salient for one individual may not be salient for another, especially with participants in different grade levels, classes, and sports programs. Thus, any attempt to standardize and quantify a sense of self-efficacy, even in a task-specific domain such as the classroom or sporting arena, will result in a loss of accurateness with respect to the individual. This standardization becomes particularly problematic with smaller sample sizes, as in the present study. Hence, it is possible that the self-efficacy measures were too general to find a relation between academic and athletic self-efficacy.

In addition to the measurement of self-efficacy, the measurement of athletes versus non-athletes was self-reported in the present study. This is a limitation because it allowed participants to define themselves whether or not they were in an organized sports program. Hence, there was no way for the researcher to verify whether participants were practicing and competing regularly as part of their sports program.

On a final measurement note, the present study did not include a measures of “success” or perceived social support for athletes participating. These variables may have been related to sports participation, self-efficacy, and academic achievement.

**Data collection.** Another methodological limitation may have occurred during the collection of data. At one school, all data were collected in one day during a morning meeting held in the school’s auditorium. With students taking the surveys simultaneously, participants sat in close proximity to one another and were not prohibited from talking while filling out the surveys. Thus, it is possible that participants may have
been influenced by their peers’ answers to the survey questions, reducing the number of individual differences in the sample. At another school, teachers in each free reading period were in charge of distributing surveys to students. Although the principal investigator provided teachers with general instructions, she was not able to monitor data collection at this school.

Conclusions

The present study was consistent with previous research documenting a positive relation between sports participation and academic achievement, as well as with other studies demonstrating a link between self-efficacy and academic success. Additionally, the present study found evidence for an indirect relationship between sports participation and GPA through the mediating variable of self-efficacy. This link was limited to the task-specific measure of academic self-efficacy in relation to GPA, however, as no link was found between athletic self-efficacy and academic self-efficacy for the study’s athlete participants.

The present study has many implications. If the link between sports participation and academic achievement is partially due to the opportunity for exercise present in organized sports programs, schools should consider the value of having physical activity as part of their daily schedule. With an increased focus on test preparation and budget cuts in many states, school based physical activity programs are frequently being cut (Baker, 2012). Additionally, students who do participate in sports should be encouraged in these pursuits, and school faculty might consider encouraging interested students to try organized sports programs. Finally, schools should consider using their budgets not only for school-based physical activity during the day, but for school-based organized sports
programs available to all interested students. The fact that athletes in the present study came from higher socioeconomic backgrounds than non-athletes suggests that sports programs may not be readily available to students from all backgrounds.

Additionally, the value of organized sports programs may extend beyond the opportunity for exercise. The present study provides evidence for a link between sports participation, self-efficacy, and academic achievement. Both teachers and sports coaches should consider ways to best foster self-efficacy among students, whether that be providing opportunity for mastery experiences (e.g. helping students set goals), or being a source of positive social support.

**Directions for Future Research.** The above results offer many opportunities for future research. Although several studies have documented a link between sports participation and academic achievement, further research may want to explore this with varying samples, such as in public versus private schools. Additionally, research in this area may want to take a longitudinal approach in which the potential benefits of sports participation on GPA are examined after several years, rather than within the same school year. The question of whether self-efficacy can be transferred between the athletic and academic domains is also a salient one. Future researchers may want to examine this in relation to athletic successes by comparing levels of athletic and academic self-efficacy among high-achieving athletes versus those among lower-achieving athletes.

As long as organized sports programs continue to be popular among adolescents, this area of research will remain important. The potential benefits and drawbacks of sport participation for academic achievement are important to understand. The relations
between self-efficacy and both academic and athletic achievement are a promising avenue through which to conduct this research.
**Appendix A: Academic Self-Efficacy Scale**

Directions: Please answer the following questions by recording a number from 0 to 7 using the scale given.

How well can you:

1. Finish homework assignments by deadlines?
   
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2. Study when there are other interesting things to do?
   
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3. Concentrate on school subjects?
   
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4. Take class notes of class instruction?
   
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5. Use the library to get information for class assignments?
   
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6. Plan your schoolwork?
   
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7. Organize your schoolwork?
   
   | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
not well not too pretty very
at all well well well

8. Remember information presented in class and textbooks?

1 2 3 4 5 6 7
not well not too pretty very
at all well well well

9. Arrange a place to study without distractions?

1 2 3 4 5 6 7
not well not too pretty very
at all well well well

10. Motivate yourself to do schoolwork?

1 2 3 4 5 6 7
not well not too pretty very
at all well well well

11. Participate in class discussions?

1 2 3 4 5 6 7
not well not too pretty very
at all well well well

How well can you:

1. Learn general mathematics?

1 2 3 4 5 6 7
not well not too pretty very
at all well well well

2. Learn algebra?

1 2 3 4 5 6 7
not well not too pretty very
at all well well well

3. Learn science?

1 2 3 4 5 6 7
not well not too pretty very
at all well well well
4. Learn biology?

1 2 3 4 5 6 7
not well not too pretty very
at all well well well

5. Learn reading and writing skills?

1 2 3 4 5 6 7
not well not too pretty very
at all well well well

6. Learn to use computers?

1 2 3 4 5 6 7
not well not too pretty very
at all well well well

7. Learn foreign languages?

1 2 3 4 5 6 7
not well not too pretty very
at all well well well

8. Learn social studies?

1 2 3 4 5 6 7
not well not too pretty very
at all well well well

9. Learn English grammar?

1 2 3 4 5 6 7
not well not too pretty very
at all well well well
Appendix B: Athletic Self-Efficacy Scale

Directions: The following survey is for students participating in sports. Think about how self-confident you are when you compete in sport. Answer the following questions based on how confident you generally feel when you compete in your sport. Please try to determine how you really feel, not how you would like to feel. Compare your self-confidence level to the self-confidence level of the most self-confident athlete you know. Scale: 1 = lowest, 5 = medium, 9 = highest (circle number from 1 to 9)

1. Compare your confidence in your ability to execute the skills necessary to be successful to the most confident athlete you know.

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2. Compare your confidence in your ability to make critical decisions during competition to the most confident athlete you know.

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3. Compare your confidence in your ability to perform under pressure to the most confident athlete you know.

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4. Compare your confidence in your ability to execute successful strategy to the most confident athlete you know.

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5. Compare your confidence in your ability to concentrate well enough to be successful to the most confident athlete you know.

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6. Compare your confidence in your ability to adapt to different game situations and still be successful to the most confident athlete you know.

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7. Compare your confidence in your ability to achieve your competitive goals to the most confident athlete you know.

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8. Compare your confidence in your ability to be successful to the most confident athlete you know.

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9. Compare your confidence in your ability to be consistently successful to the most confident athlete you know.

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10. Compare your confidence in your ability to think and respond successfully during competition to the most confident athlete you know.

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11. Compare your confidence in your ability to meet the challenge of competition to the most confident athlete you know.

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12. Compare your confidence in your ability to be successful even when the odds are against you to the most confident athlete you know.

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13. Compare your confidence in your ability to bounce back from performing poorly and be successful to the most confident athlete you know.

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Appendix C: Sports Participation Questionnaire

Directions: Please answer the following questions.

Do you currently participate in at least one organized sports program? This can include programs both in and out of the school setting.
Circle:       Yes            No

If yes, which sport(s)? _____________________________________________________

If no, did you recently stop participation in an organized sports program?
Circle:       Yes            No

If yes, why did you stop participation?
_______________________________________________________________________

Do you participate in any non-sport extracurricular activities?
Circle:       Yes            No

If yes, which activity(s)? ________________________________________________

Whether in an organized sports program or on your own, during the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day? (Add up all the time you spent in any kind of physical activity that increased your heart rate and made you breathe hard some of the time).

-1 day
-2 days
-3 days
-4 days
-5 days
-6 days
-7 days

For athletes or anyone else involved in an extracurricular activity:
In the past week, how many days did you practice at the following times?
In the morning before school: 0  1  2  3  4  5
In the afternoon after school: 0  1  2  3  4  5
In the evening on days that you have school: 0  1  2  3  4  5
On the weekend: 0  1  2

How many hours did you practice in the past week?
During the school week: _____ hours
During the weekend: _________ hours
What time do you usually go to bed on school days? List one time, not a range. Remember to include minutes, even if minutes are 0.

_______________________________ AM PM

What time do you usually wake up on school days?

_______________________________ AM PM

What time do you usually go to bed on weekends?

_______________________________ AM PM

What time do you usually wake up on weekends?

_______________________________ AM PM

For those who participate in any sport or non-sport activities: During the last week, have you struggled to stay awake or fallen asleep during your activity?
- No
- Fallen Asleep
- Struggled to Stay Awake
- Both Fallen Asleep and Struggled to Stay Awake

If you did not have your activity, when would you go to bed?
- Earlier than you do.
- Later than you do.
- The same as you do.

If you did not have your activity, when would you wake up?
- Earlier than you do.
- Later than you do.
- The same as you do.
Appendix D: Demographic Information

Directions: Please fill out the following demographic information.

Student Name__________
Date of Birth ______________
Grade ______________
Gender _______
Height ______________
Weight ______________
Zip Code_____________

Please specify your ethnicity:
-Hispanic or Latino
-Not Hispanic or Latino

Please specify your race by circling all that apply:
-American Indian or Alaska Native
-Asian
-Black or African American
-Native American or Other Pacific Islander
-White

Circle the highest level of education completed by your mother:
High School, Some College, College Graduate, Advanced Degree

Circle the highest level of education completed by your father:
High School, Some College, College Graduate, Advanced Degree
References


doi:10.1046/j.0024537.2003.00095.x


Sleep For Science. (n.d.) retrieved from:
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