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Collective Efficacy Beliefs And Their Sources In NCAA Division I Soccer Players

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COLLECTIVE EFFICACY BELIEFS AND THEIR SOURCES IN NCAA DIVISION I SOCCER PLAYERS

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Table of Contents

List of Tables

List of Figures

ABSTRACT

Instruments for the measurement of collective efficacy beliefs in college athletes do not provide domain-specific information that reflects the unique nature of collegiate athletics or the characteristics of specific sports. Without domain-specific measures, interventions designed to enhance collective efficacy beliefs in collegiate athletes will not be optimized. This study proposes new scales to measure the collective efficacy beliefs of NCAA Division I soccer players and identify the sources of those beliefs. Additionally, this study aims to measure how well collective efficacy beliefs are predicted by their individual sources and how the academic, social, and structural background factors present in the collegiate athletic environment moderate the relationship between collective efficacy beliefs and their sources. To test collective efficacy beliefs and their sources, a survey was distributed to NCAA Division I soccer players. Scale structures were validated using a confirmatory factor analysis (CFA). The predictive power of the sources and moderating effect of background factors were analyzed with multiple regression. The results suggested a Sources of Collective Efficacy Beliefs scale comprised of *positive preparation* and *performance environment* and a Collective Efficacy Beliefs scale comprised of *self-regulation* and *inclusivity*. The results also showed that positive preparation and performance environment significantly predicted collective efficacy beliefs and background factors had no moderating effect. These results suggest that a collective efficacy beliefs scale for NCAA Division I soccer players should include academic, social, and structural items, and that coaches can enhance collective efficacy beliefs in their teams by influencing positive preparation and the performance environment.

COLLECTIVE EFFICACY BELIEFS AND THEIR SOURCES IN NCAA DIVISION I SOCCER PLAYERS

Chapter 1

Intercollegiate athletics programs in the United States provide opportunities for positive development in college students. However, these benefits come with costs: student-athletes at the 1,122 National Collegiate Athletic Association (NCAA) member institutions face the traditional challenges of the college experience, but add the demands of athletic participation (Beauchemin, 2014; NCAA, n.d.-b). One NCAA rule that illustrates these demands is that during the championship segment of the academic year (i.e., when the national championship competition occurs, like March Madness in basketball) student-athletes can be required to participate in "countable athletically related activities" for up to 20 hours in a 7-day week, with 1 mandated day off (NCAA, 2019b). 20 hours is already a significant commitment, but does not account for additional demands such as travel for competitions, preparing for and recovering from practice, getting to and from the practice site, and so forth. In total, an NCAA student-athlete could commit 35–40 hours to practices, film sessions, meetings, strength training, competitions, and travel time in a 7-day period.

When student-athletes are not engaged in activities related to their sport, they are attending classes, socializing, studying, and doing all the things that make up the sum of the college experience for non-athletes. This is not to suggest that college is easy for non-athletes. They are often away from home for the first time, have new and challenging responsibilities, and are in a complex stage of development labeled by Arnett (2000) as "emerging adulthood," which

he defined as the period between the ages of 18 and 25 (p. 469). More specifically, Reifman et al. (2007) found that identity exploration, experimentation, and instability were all highest in 18–23-year-olds, the age group that describes most college students. For student-athletes, the time and energy demands of intercollegiate competition complicate their relationship with these constructs and can make it more difficult for them to succeed in their college lives (Harris et al., 2003; G. Wilson & Pritchard, 2005).

Purpose

For many coaches, helping student-athletes manage these demands is rewarding. Although coaches want to succeed in competitions, the most rewarding work can be the development of efficacy beliefs and agency in student-athletes and watching them lead impactful lives after they leave collegiate athletics. To help coaches and athletes in this endeavor, a robust industry has grown up around providing resources for the nearly 20,000 sports teams sponsored by the NCAA (2019a). In recent years, Angela Duckworth's (2016) grit scale (p. 55) and workbooks based on Carol Dweck's (2006) concept of growth mindset (Ricci, 2013) are two popular methods used by coaches. Coaches at all levels can also engage in webinars on the sources of winning behaviors (What Drives Winning, n.d.), subscribe to multiple podcasts on character development, and attend talks to hear inspiring stories of athletes whose grittiness, growth-mindedness, and perseverance helped them to realize their personal and athletic potential. Indeed, the amount of material available to athletes and coaches for development and measurement of individual attributes like confidence and resilience can be overwhelming and continues to grow.

There is less research that explores the development of group or collective efficacy beliefs in a sport setting. This is in part because collective efficacy beliefs are difficult to measure, as they depend on measuring the coordination among group members, and involve assessing complex, socially situated interactions (Bandura, 1997; Chase et al., 2003). Researchers theorize that collective efficacy beliefs are based in part on individual efficacy beliefs but can also include emergent qualities like team cohesion and the environment created by leaders (Bandura, 1997; Gershgoren et al., 2016; Tziner et al., 2003). The effort to understand collective efficacy beliefs benefits athletes and coaches in team sports, as those efficacy beliefs are strongly linked to team performance and objective measures like wins and losses (Gully et al., 2002; Stajkovic et al., 2009).

Research in sport often examines the relationship between collective efficacy beliefs and proposed sources like group cohesion (Paskevich et al., 1999); past performance (Tasa et al., 2007); leadership (Watson et al., 2001); and motivational climate (Heuze, Sarrazin, et al., 2006). However, after more than 20 years of research there are still multiple conceptualizations of the best methods to measure collective efficacy beliefs and their sources in sports. For instance, researchers have used various task-oriented measures of collective efficacy beliefs for volleyball (Heuze, Sarrazin, et al., 2006); soccer (Atkinson et al., 2017); and American football (Myers et al., 2004). However, the task-oriented nature of most collective efficacy belief research in sport fails to account for the context in which performance occurs, whether the environment of interest is youth, college, or professional. There is a need for further research that supports previous findings on sources of collective efficacy beliefs for collegiate athletes, but also includes evidence for how those beliefs are influenced by the collegiate athletic environment and the specific sport being considered. This research will further the literature by examining which

collective efficacy sources are present for NCAA Division I soccer players and the relative strength of those sources, and by proposing new instruments to measure collective efficacy beliefs and their sources. These new measures will account for the effects of *social factors* (e.g., socialization and athletic/academic identity dissonance); *academic factors* (e.g., missed class and academic pressure); and *structural factors* (e.g., condensed competition schedule and yearly roster turnover) on collective efficacy beliefs.

Social Cognitive Theory

Bandura's (1986) social cognitive theory (SCT) is the foundation for the research on self- and collective efficacy beliefs presented here. SCT is a framework that allows researchers to consider not only how people respond to their environment, but how they shape that environment in return. Drawing a *bi*directional arrow between people's behavior and their environment adds a new dimension to the understanding of human agency and requires consideration of *personal factors* along with *behavior* and *environment*. These three factors then act in triadic reciprocal causation to guide behavior, meaning that each one influences the other two (Bandura, 1997).

SCT explains how the combination of environment, personal factors, and behaviors creates a human agent who is "self-organizing, proactive, self-regulating, and self-reflective" (Bandura, 2006, p. 164). Without this human agency, as Bandura (1997) explained, the prolific works of classical pianist Johann Sebastian Bach would have taken "countless lifetimes to shape …by selective reinforcement of random variations" (p. 8). In sport, if athletes were simply reacting to random variations in their environments and had no agency to change those environments, there would be little to inspire fans about athletic achievement. Sport spectators would be reduced to mere appreciation of the physical gifts of elite athletes and the hope that the environment was favorable for their team on a given day. Sports fans would never feel the

emotion of a story about an undersized football player whose hours of practice unexpectedly earned him a spot on a professional roster, or the uplifting story of an Olympic endurance athlete who wins a gold medal through dogged preparation and determination, though less physically talented than fellow competitors.

Although each of the three social cognitive factors act upon each other, the magnitude of the bidirectional arrows connecting personal, behavioral, and environmental factors are not equal. The influence of each factor on the others is *domain-specific*, meaning that it depends on the situation or domain being examined (Bandura, 1997). This is the most important aspect of SCT, as Bandura explained. Domain-specificity provides "explicit guidelines on how to enable people to exercise some influence over how they live their lives" (1997, p. 10). This research will examine self- and collective efficacy beliefs, both of which are categorized as personal factors in the SCT triadic formulation. Efficacy beliefs are created when information from various sources is received and interpreted by individuals or groups. These beliefs then predict the types of activities in which individuals and groups choose to engage, how long they will persist in the face of adversity or failure, and how successful they will be in their performance of domain-specific tasks (Bandura, 1997).

The desire to understand the antecedents of successful performance is clear from the amount of research available that examines how self- and collective efficacy beliefs predict successful performance. Indeed, multiple researchers have shown strong evidence for the positive relationship between efficacy beliefs and performance in business, academics, military, and sport settings (Gully et al., 2002; Moritz et al., 2000; Stajkovic et al., 2009). However, it is not enough to know that efficacy beliefs are important for performance: practitioners must

understand what sources of efficacy information build and sustain those beliefs in different domains of activity.

Self-efficacy Beliefs and Their Sources

According to Bandura (1989) an individual's assessment of their capabilities is central to how individual thoughts become actions. These individual beliefs in the ability to accomplish specific tasks are known as s*elf-efficacy beliefs* (Bandura, 1997). Self-efficacy beliefs predict behavior by influencing the selection of activities, perceived difficulty of those activities, and persistence in the face of adversity or failure. In practice, this suggests that individuals with high self-efficacy beliefs will choose challenging activities, persevere in the face of adversity or failure, and expect that they will succeed (Bandura, 2006). According to multiple researchers, self-efficacy beliefs predict human behavior more accurately and reliably than other psychological constructs like self-concept and self-esteem (Bandura, 1997; Feltz, 2007; Nordin et al., 2018).

According to self-efficacy theory, self-efficacy beliefs are "a multifaceted belief system, not a unitary personality trait" (Bandura, 1997, p. 382) and can change over time and across different activities. Self-efficacy beliefs are multifaceted in that they include several "salient personal efficacy constructs" that can be measured independently and contribute to overall self-efficacy beliefs (Beauchamp et al., 2012, p. 377). According to Beauchamp et al. (2012), these constructs include competitive/normative efficacy beliefs, learning efficacy beliefs, decision-making efficacy beliefs, problem-solving efficacy beliefs, coping efficacy beliefs, self-regulatory efficacy beliefs, and self-presentational efficacy beliefs. Collegiate athletes provide a clear example of how these personal constructs can impact overall efficacy beliefs. A college soccer player, for instance, may be confident in their ability to learn new soccer skills and strategies

(learning efficacy belief), but be nervous about their ability to overcome a setback in their development, like an injury (coping efficacy belief). The college soccer player could also feel confident in their ability to go to sleep early and wake up for an early practice (self-regulatory efficacy belief), but feel like once they arrived at practice, they looked unfit and disheveled compared to their teammates (self-presentational efficacy belief).

Likewise, self-efficacy beliefs are not traits that an individual builds and then has available when needed; indeed, self-efficacy beliefs often change moment-to-moment in response to the changing influence and interpretation of different sources of efficacy information. Variables that affect efficacy beliefs may include the motivational climate (i.e., mastery v. ego), the attributions individuals make for performances, and personal factors like intrinsic motivation and ability to self-regulate.

Much of the recent research on self-efficacy beliefs focuses on how the strength of efficacy beliefs predicts the achievement of desirable outcomes, like winning competitions against outside opponents. The interest in this relationship is based on the observation that effective performance requires that successful individuals not only have relevant skills but have the efficacy beliefs to use those skills well (Bandura, 1997). Researchers have studied the influence of efficacy beliefs on performance in multiple domains, including athletics (Hays et al., 2009; Moritz et al., 2000) and academic success in university students (Alhadabi & Karpinski, 2020; Honicke & Broadbent, 2015). However, this information is of limited use to practitioners like coaches and school administrators if not accompanied by an understanding of how to develop and sustain those beliefs through the *sources* of self-efficacy beliefs.

Sources of self-efficacy beliefs are the various types of efficacy information available to individuals (Bandura, 1997). Bandura (1977) theorized that there were four sources of self-efficacy beliefs. *Enactive mastery experiences* provide information to individuals through their performance of a task. *Vicarious experiences* involve individuals watching themselves or others perform a task. *Verbal persuasion* is positive or negative information that can come from an internal (e.g., self-talk) or external (e.g., coach) source. Finally, *physiological and affective states* influence self-efficacy beliefs through information from the body and the emotions of the individual.

Although the identified sources of efficacy information may be constant, the influence of each source on individual efficacy beliefs can fluctuate based on the domain being examined (Bandura, 1997; Usher & Pajares, 2008). Verbal persuasion provides an example for high school teachers and physicians. As Morris et al. (2016) found, verbal persuasion can have a significant effect on teacher self-efficacy beliefs. For physicians, on the other hand, Bandura (1997) theorized that the same verbal persuasion may not carry much weight if consistent mastery experiences sustain their confidence in their ability to heal patients. The following examination of the sources of self-efficacy beliefs addresses the domain-specific nature of those beliefs and the subprocesses that influence the relative strength of each source.

Enactive Mastery Experience

Enactive mastery experiences (hereafter just *mastery experiences*) have been shown to be the most influential source of self-efficacy beliefs in populations as diverse as collegiate athletes (Chase et al., 2003) and elementary school math students (Usher & Pajares, 2009). Although mastery experiences are a powerful source of self-efficacy beliefs, this efficacy information must pass through the individual's interpretation of the performance to improve future performances

(Bandura, 1997). For example, interpretation of mastery information may be based on different types of self-referent thought, such as what the individual already believes about their ability (Bandura, 1989). Because of this, the tenth successful performance of the same task may not alter efficacy beliefs as much as the first performance. Interpretation may also be based on the difficulty of the task, the amount of assistance provided by others, and the amount of effort expended in performing the task. Increases in self-efficacy beliefs will be most significant when the task is considered normatively difficult, is accomplished with little outside help, and requires a level of effort that the individual considers appropriate for that task (Bandura, 1997).

Vicarious Experience

Vicarious experience is Bandura's (1977) second source of self-efficacy beliefs. Vicarious efficacy information comes from individuals watching themselves or others model the performance of a task, either in person or through other media such as video. According to Bandura (1997), there are four subprocesses that govern how vicarious efficacy information is interpreted and subsequently influences performance: attention, retention, production, and motivational processes. This suggests that practitioners should know how individuals decide what they pay attention to, their strategies for remembering the information, how they make use of the information they retain, and what motivates them to use the new information. These subprocesses will be especially relevant for the later discussion of video and imagery in sport contexts.

A caveat for this source of efficacy information is that not all modeling is equally effective: maximum effect on efficacy beliefs requires that observed models be as similar as possible to the individual watching in characteristics such as gender, race, and ability level

(Usher & Pajares, 2008). In studying elementary school math students, for example, Schunk and Hanson (1985) found that observing peer models had a more positive effect on self-efficacy beliefs than observing teacher models, and further exploration revealed that for a novel math task, the successful modeling of *coping* behaviors had a more positive impact on self-efficacy beliefs than the modeling of *mastery* behaviors (Schunk et al., 1987). Students gained more belief from watching models overcome difficulties than they did from watching effortless execution. However, as Bandura (1997) pointed out, self-efficacy beliefs can still increase through dissimilar modeling if the individual already has some belief in their ability, or if the model demonstrates proficiency using easily understood and replicated strategies. Also, watching the success of dissimilar or unrelatable models can negatively impact individuals' self-efficacy beliefs, if they cannot imagine themselves duplicating the observed behavior (Bandura, 1997).

Verbal Persuasion

Verbal persuasion, Bandura's (1977) third source of self-efficacy beliefs, also requires efficacy information from external sources. As with mastery and vicarious experiences, the presentation of verbal efficacy information to an individual is not sufficient by itself to influence efficacy beliefs: it must be interpreted. For instance, Jourden (1993) found that framing verbal feedback in terms of progress *made* led to significantly higher efficacy beliefs when compared with framing the same feedback in terms of progress that still *needed to be made*. Telling individuals that they have already finished 50% of a task will increase belief more than the (equally accurate) formulation that there is still 50% to go, assuming that the relative difficulty of each 50% is comparable.

Verbal feedback that focuses only on the amount of effort expended in a successful performance can also be problematic, as it may cause the hard-working individual to doubt that they have any real ability (Schunk & Rice, 1986). For example, this doubt may decrease an individual's motivation to become more skilled, if they believe that hard work is all they need to succeed. Interpretation of verbal efficacy information can also change based on temporal distance from the potential reward for successful performance: motivation to avoid failure in the near term can result in higher efficacy beliefs than motivation for achieving recognition far in the future (Bandura, 1997). Additionally, the perceived credibility and expertise of the verbal feedback source affects individual responses (Bandura, 1997). Individual efficacy belief is more likely to increase based on the positive feedback of an expert, provided the feedback does not differ substantially from the individual's own appraisal of their ability. The credibility and expertise of feedback sources will be crucial for the later discussion of how coaches and other leaders influence individual and team efficacy beliefs in sport settings.

Physiological and Affective States

Physiological (biological) *and affective* (emotional) *states* are Bandura's (1977) final sources of self-efficacy beliefs. As with the previous three sources, an individual's interpretation of physiological and affective efficacy information influences subsequent behavior. For instance, a physiological response for a teacher may present as sweating palms as they prepare to stand in front of their class for the first time. The teacher who believes this response is due to the temperature of the room may have different belief in their teaching efficacy than one who believes the sweating is due to a lack of self-confidence in their teaching ability (Bandura, 1997).

The strength or intensity of the physiological arousal may also affect efficacy beliefs. Using the previous example, a teacher with sweating palms could ignore the slight discomfort, while the same response translated to their entire body would be a different proposition. Finally, individual moods are often important filters for efficacy information. An individual who succeeds when in a bad mood may then underestimate their true ability, while an individual who fails when in a good mood may overestimate their ability (Bandura, 1997). In sports, the effects of physiological arousal and emotion can have an outsized effect, as athletes often experience physical exhaustion along with the emotional highs and lows of winning and losing a competition.

Collective Efficacy Beliefs and Their Sources

Collective efficacy beliefs are of particular interest in a modern society because more than ever, work is done in group settings and requires coordinated effort (Bandura, 1997). Effective teams may have to collaborate across multiple departments, institutions, states, or even nations. Bandura (1997) defined collective efficacy beliefs as "a group's shared belief in its conjoint capabilities to organize and execute the courses of action required to produce given levels of attainment" (p. 477). The most important part of this definition is that collective efficacy belief is a shared perception (Zaccaro et al., 1995). As Watson et al. (2001) stated, "If individual perceptions of collective efficacy are not shared, then there is no basis for viewing collective efficacy as a group attribute" (p. 1058).

Although researchers have posited that self- and collective efficacy beliefs share many of the same sources (Bandura, 1997; Zaccaro et al., 1995), there is also evidence that the relative importance of each collective efficacy source may differ in certain domains and across cultures

(e.g., nursing, education, business; Gibson, 2003). Additionally, research suggests that work in group settings brings forth emergent sources of efficacy beliefs like group cohesion (Marcos et al., 2010) and group leadership (Chen & Bliese, 2002), which would not be present in individual settings. The following section will examine how the sources of efficacy beliefs may differ in collective settings.

Enactive Mastery Experiences

For mastery experiences, there are clear differences between individual and group settings. When individuals view past successful actions they benefit from their personal interpretation of the outcome, without conflicting opinions. Conversely, in a group, multiple individuals may have different interpretations of an outcome, which could weaken overall group efficacy belief. For instance, an elementary school volunteer may see 50% progress towards a fundraising goal as a laudable accomplishment, while the principal of the school, with a district-wide perspective, feels discouraged at how much they still need to accomplish (Bandura, 1997). This challenge of creating a shared interpretation of efficacy information is common to all sources of collective efficacy beliefs.

Vicarious Experience

Vicarious experience for individuals through self- and other-modeling requires the use of models similar to the individuals to be most effective (Bandura, 1997). However, modeling becomes more complicated when attempting to find individual or team models relatable to an entire group. One member of a team may feel inspired by watching another team perform well, while another member loses confidence because they cannot connect the performance they have witnessed and the capabilities of their own team. In team sports, variations in intra-team

experience and skill level can require individualized approaches to modeling, in order to maximize the amount of shared belief (Bandura, 1997).

Vicarious experience can also be obtained without external models, through mental imagery (Munroe-Chandler & Hall, 2004; Shearer, 2015). Imagery training consists of "creating or recreating experiences" in the mind and as with other sources of self- and collective efficacy beliefs, it is most effective when designed for a specific domain, i.e., sports, martial arts, music (Munroe-Chandler & Guerrero, 2017, p. 1). According to Hall et al. (1998) imagery training can be either cognitive or motivational. Cognitive imagery involves creating mental experiences that concern the execution of individual or team strategies and skills, while motivational imagery focuses on physiological and emotional states and individual or team goals (Munroe-Chandler & Guerrero, 2017).

Verbal Persuasion

Bandura's (1977) third source of efficacy beliefs, verbal persuasion, can manifest for teams as fans and coaches shouting encouragement to athletes during competition to motivate better performance. However, the overall effect of this encouragement on collective efficacy beliefs depends on interpretation by group members. For instance, individuals who are not happy with their role in the group or who do not identify with the group's inner circle could view well-intended encouragement as condescension or patronization (Bray et al., 2002; Zumeta et al., 2016). In athletic teams, much of the verbal persuasion and social comparison for the team originates with the coach, and each individual's perception of the coach's credibility and expertise will influence how they interpret the information received (Goddard et al., 2004). Coaches must understand how the roles and perspectives of individual athletes can change from

game to game, or even moment to moment within a competition, so they can calibrate their communication to enhance a shared sense of efficacy (Feltz & Lirgg, 1998; Fransen et al., 2014).

Physiological and Affective States

Physiological and affective states are perhaps the most challenging sources of efficacy beliefs to assess and modify in a collective setting. Group feelings and moods can emerge through multiple subprocesses, including the sharing of mental models, agreement upon group goals, and the creation of the performance climate by the coach or team leaders (Filho et al., 2015; Heuze, J., Fontayne, P., & Raimbault, N., 2006). Although physiological and affective states are often presented by researchers as separate sources of collective efficacy beliefs, it is incumbent upon coaches, teachers, and other leaders to shape group emotions and moods through intentional management of interpersonal relationships and by setting the environmental conditions (Atkinson et al., 2017; Hampson & Jowett, 2012). This evidence that team moods and emotions are affected by the environment hints at the importance of group leadership for collective efficacy beliefs. When leaders do not set efficacious conditions, negative physical and emotional responses to performance situations can hinder the attainment of desired outcomes.

Group Leadership

Leadership is a multifaceted construct defined by Northouse (2013) as "a process whereby an individual influences a group of individuals to achieve a common goal" (p. 5). As a process, leadership is not a fixed personal trait, and is characterized by interactions that are filtered through leadership styles (e.g., transformational, transactional), interpersonal relationships, and the overall environment created by the leader (Northouse, 2013). Influencing

collective efficacy beliefs through adaptive behaviors is one of the primary responsibilities of a leader, which leads to enhanced performance for groups (Chen & Bliese, 2002).

Leaders can influence these collective efficacy beliefs in several ways. For instance, research has demonstrated that leaders influence collective efficacy beliefs directly through verbal persuasion in pregame and halftime speeches, and other outward motivational behaviors (Skrla & Goddard, 2002; Vargas-Tonsing & Bartholomew, 2006). However, motivational speeches and "pep-talks" are not effective by themselves but require a strong interpersonal connection and high levels of trust between leaders and team members (Chou et al., 2013; Sudha et al., 2016). Researchers have also found that leaders influence collective efficacy beliefs in business settings through the creation of a problem-solving environment (Adams & Forsyth, 2006); by empowering their groups (Jung & Sosik, 2002); and in the U.S. military through the implementation of a leadership climate that values individual feelings and sets clear work objectives (Chen & Bliese, 2002). A complete analysis of leadership styles is beyond the scope of this research, but an analysis of how individuals perceive leader effectiveness will guide the examination of group leadership as a source of collective efficacy beliefs.

Group Cohesion

Group cohesion is similar to group leadership in that it has a complex relationship with collective efficacy beliefs. For the purposes of this research, group cohesion is defined as "a dynamic process that is reflected in the tendency for a group to stick together and remain united in the pursuit of its instrumental objectives and/or for the satisfaction of member affective needs" (Carron et al., 1998, p. 213). Researchers describe group cohesion as a multidimensional and dynamic construct, which suggests that like collective efficacy beliefs, it can fluctuate based on

changing conditions (Carron & Brawley, 2000). This has led to disagreement among researchers as to how group cohesion is related to collective efficacy beliefs.

Bandura (1997) described group cohesion as a mediator of the relationship between collective efficacy beliefs and performance. In this view, groups with strong collective efficacy beliefs become more cohesive, leading to better performances. Central to this theory is the idea that group cohesion predicts performance particularly well for activities where there is high task interdependence among members, because of the increased reliance of group members on each other (Bandura, 1997). On the other hand, Paskevich et al. (1999) theorized that group cohesion was a team climate influencer for collegiate volleyball players and suggested that building group cohesion led to stronger belief in group ability. This view posits group cohesion as a source of collective efficacy beliefs. For the purposes of this research, group cohesion will be examined as a potential source of collective efficacy beliefs, with the knowledge that it may also predict how well teams with strong collective efficacy beliefs perform.

This discussion of group cohesion is based on foundational research performed by Carron et al. (1985), who created the Group Environment Questionnaire, which described the forms of cohesion in terms of level (i.e., *individual attraction to the group* vs. *group integration*), and type (i.e., *task* vs. *social*). The individual aspect of group cohesion describes with what the group does for the individual, by making individuals feel welcome or making individuals feel that they can perform the tasks required of them. The group aspect of group cohesion describes individual perceptions about the group, like whether the group is close-knit, or whether the group is united to accomplish its work. The last two measures are of particular interest here, as they support shared mental models that in turn influence collective efficacy beliefs.

Even if all four aspects of cohesion are present in a group, the influence of each may fluctuate based on contextual factors. For example, in personal discussions with current and former collegiate athletes, I analyzed task cohesion and social cohesion in semi-professional and professional sport environments. These athletes suggested that in professional sports, athletes often have a social life that includes friends and family outside of the team and may therefore not value the social relationships within the team as much. Likewise, professional athletes depend on their performance to make a living, so task cohesion, or the unity of the group in executing the required actions to win, may be more important for their collective efficacy beliefs. In the college sports environment, the overlap between on-field and off-field social circles may increase the importance of social cohesion for strong collective efficacy beliefs. For a coach or other leader, understanding and nurturing the most influential types of cohesion for a particular group may be crucial to building and sustaining efficacy beliefs.

As previously noted, there is evidence that collective efficacy beliefs are correlated to individual efficacy beliefs, and therefore rely in part on the same sources for their development (Bandura, 1997; Zaccaro et al., 1995). However, adding emergent sources like group leadership and group cohesion could change the relative influence of mastery experiences, vicarious experiences, verbal persuasion, and physiological and affective states. Assessing which sources are most influential and why requires an understanding of the context that surrounds task performance for a team, but also the context that surrounds the social lives of the team members performing the tasks. For this research, the context of interest is the college environment, where students are developing in both individual and collective settings.

College Environment

The college context for individuals and groups is a combination of the organizational personality of each institution and the characteristics of students and teams (Hoy, 2012). For the purposes of this research, a "college" is any 4-year institution in the United States whose sports programs fall under the purview of the NCAA. This definition includes institutions that award advanced degrees and certificates in addition to baccalaureate degrees, institutions in rural and urban environments, and institutions of all populations and geographical sizes, whether public or private. Defining college in this way is not intended to exclude or minimize the value of other higher education settings (e.g., Junior College, Technical College) but to focus attention on how collective efficacy beliefs develop in athletes who are experiencing college in similar ways.

According to Education Data (n.d.) statistics, in 2019 there were a total of 12.5 million students enrolled full- or part-time at 4-year institutions. Approximately 2.3 million were between the ages of 18 and 24 (M = 21.8 years) and were attending a 4-year college or university for the first time (Education Data, n.d.). Among these 2.3 million are students from diverse backgrounds with various intersections of identity including race, gender, and socioeconomic status (Crenshaw, 1991). For the approximately 460,000 NCAA student-athletes across the 24 sports sponsored by the NCAA, the addition of an athletic identity to the student identity creates unique challenges and opportunities (NCAA, n.d.-c). As with any environment, college can impact the types of efficacy information individuals and groups receive, and how their interpretation of that information strengthens or weakens their collective efficacy beliefs.

Student-Athlete Development

Colleges perceive student-athletes as a separate and distinct population that requires unique programs (Ting, 2009). Indeed, a cursory search of dozens of NCAA collegiate athletics

websites shows that most require at least a freshman orientation class for incoming student-athletes in addition to campus orientation as a first-year student. This type of student-athlete programming became a focus for the NCAA in 1994, with the introduction of the Challenging Athletes' Minds for Personal Success (CHAMPS/Life Skills) program (NCAA, 1999). Since then, the CHAMPS curriculum and institutional participation have increased steadily, and topics taught to incoming freshmen now include life skills, social belonging, financial literacy, career readiness, sport psychology, dealing with academic stress, and managing interpersonal relationships (NCAA, 2020c; North Carolina State University, n.d.).

The topics addressed by such student-athlete programs are organized for this research into *social factors*, *academic factors*, and *structural factors*. Social factors are related to the ways student-athletes integrate with their teammates and the student body in athletic and social settings on their campus (Marx et al., 2008). Academic factors include how prepared student-athletes were before arriving in college and how well they manage the demands on their time and energy from classes, labs, study hall, and other requirements throughout their college careers (Aries et al., 2004). Structural factors reflect the condensed competition schedule most NCAA student-athletes experience and the limited recovery time between competitions in most sports (Soligard et al., 2016), in addition to the constant roster turnover due to the arrival of freshmen and transfers, the departure of athletes due to graduation, the accession of student-athletes to the professional ranks before graduation, or the outgoing transfer of student-athletes prior to the end of their playing careers.

Academic, social, and structural factors remain relevant as student-athletes move through their college careers; indeed, the demands and pressures may even increase if the student-athlete

is progressing toward a potential career as a professional athlete (Huml et al., 2019). Overall, for collegiate athletes, research shows that there are "heightened college adjustment demands" (Ting, 2009, p. 215). Additionally, there are persistent demands made on student-athletes throughout their college careers as athletic requirements interact with the development of social lives and academic progress toward graduation. Research suggests that the interactions of athletics with social and academic demands can have significant effects on individual and collective efficacy beliefs, by influencing how student-athletes interpret efficacy information from various sources. The next chapter will review what researchers have found about the impact of academic, social, and structural factors on the efficacy beliefs of college students in general and sport settings.

Conclusion

SCT provides the foundation for understanding human behavior. Through the development of self- and collective efficacy beliefs, individuals and groups acquire and develop skills and apply them in the appropriate context to achieve desired results. Evidence shows that self- and collective efficacy beliefs are essential for successful performances in multiple domains, like military, academic, business, and sports. However, efficacy beliefs are only meaningful through an understanding of their sources, and which contextual factors (e.g., social environment) may influence how the efficacy information from those sources is interpreted by individuals and groups.

The next chapter will review the research on self- and collective beliefs and their sources in a sport setting and examine differences between the two. This evidence for how athletes and

teams develop efficacy beliefs will be the foundation for a discussion of factors that influence self- and collective efficacy beliefs in the collegiate sport environment.

Toward that end, the following questions guided this research:

1. What are the sources of collective efficacy beliefs for NCAA Division I soccer players?
2. How do academic, social, and structural factors that are unique to the collegiate sport environment help to describe the collective efficacy beliefs of NCAA Division I soccer players?
3. To what extent are collective efficacy beliefs predicted by their sources for NCAA Division I soccer players?
4. How do the athlete's year in school, coach tenure, and size of school moderate the relationship between collective efficacy beliefs and their sources for NCAA Division I soccer players?

Chapter 2

Recall from the previous chapter that four overarching questions guided the present study: First, what are the sources of collective efficacy beliefs for NCAA Division I soccer teams? Second, how do academic, social, and structural background factors that are unique to the collegiate sport environment help to describe the collective efficacy beliefs of NCAA Division I soccer teams? Third, to what extent can collective efficacy beliefs in NCAA Division I soccer teams be predicted by Bandura's (1977) four hypothesized sources along with two additional possible sources, group leadership and group cohesion? Fourth, how do the background factors of the athlete's year in school, coach tenure, and the size of the institution moderate the relationship between collective efficacy beliefs and their sources for NCAA Division I soccer teams?

Bandura (1997) stated that self-efficacy sources influence beliefs and behavior through what efficacy information individuals attend to and how they interpret that information. Further, multiple researchers have reported on the connection between self- and collective efficacy beliefs, and the importance of understanding both to positively influence individual and group performance (Bandura, 1997; Watson et al., 2001). If collective efficacy beliefs share characteristics with self-efficacy beliefs, it is reasonable to assume that the sources of collective efficacy beliefs are related to the sources of self-efficacy beliefs. Indeed, researchers theorize that self- and collective efficacy beliefs share sources, and self-efficacy beliefs can even be seen as a source of collective efficacy beliefs (Feltz et al., 2008). This review of the extant literature

examines how the sports environment, and the collegiate sports environment, create unique relationships between efficacy beliefs and their sources for individual collegiate athletes and collegiate teams. This chapter also includes a review of efficacy belief scales currently in use, and how those scales inform this research.

Efficacy Beliefs in Sport

The domain-specific nature of efficacy beliefs suggests that to understand self- and collective efficacy beliefs in sport, researchers must examine the nature of sporting endeavors (Bandura, 1997). Sports are different from much of everyday life in that they provide objective outcome feedback in terms of wins and losses and often supplement that information with extensive statistics for individual and team performance (Watson et al., 2001). As a result, much of the literature examining self- and collective efficacy beliefs in sport has focused on how efficacy beliefs help to predict performance (Feltz & Lirgg, 2001; Fransen, DeCroos, et al., 2015). This focus on performance as the dependent variable often leads researchers to analyze only performance-related tasks when examining efficacy beliefs. Indeed, most of the instruments used by researchers to measure efficacy beliefs in sport feature items that ask athletes about the execution of performance-related tasks, such as penalty-killing in ice-hockey (Feltz & Lirgg, 1998; Myers et al., 2007); offensive execution in the red zone (within 20 yards of the end zone) for American football (Myers et al., 2004); and specific components of an adventure racing event, like climbing or mountain biking (Edmonds et al., 2009). In this task performance context, researchers have also concluded that the confidence of basketball team members in their ability to perform their role within the team predicted stronger self-efficacy beliefs (*role* efficacy beliefs; Bray et al., 2002), and the amount of belief cheerleading dyads had in their partners

predicted stronger self-efficacy beliefs and performances (*other* efficacy beliefs; Habeeb et al., 2017, 2019). This type of research is only part of the picture for efficacy beliefs.

According to Bandura (1997), athletic performance requires more than physical ability. Athletes and teams must be capable of different types of task performance (e.g., running, leaping, throwing), but also require the cognitive capability to acquire skills, prepare well for competition, and function well as a team. Therefore, athletes and teams must develop efficacy beliefs in multiple areas which will contribute to overall efficacy beliefs (Bandura, 1997). There are several examples of these multiple efficacy constructs in the literature.

For instance, there are several factors that researchers have combined into *preparation* efficacy beliefs (Bandura, 1997). Preparation efficacy beliefs consist of all the things athletes and teams do to get ready for competition. This preparation may include the acquisition of new skills, fitness training, individual and team practice sessions, proper nutrition, or sleep hygiene. In sport settings, physical preparation is crucial to preventing injury and keeping the best athletes involved in the competition, while rehearsal of strategies and movements in practice sessions is considered one of the most important predictors of how an individual or team will perform in a competition.

Researchers consider preparation efficacy beliefs as one part of *process* efficacy beliefs, which are different from *outcome* efficacy beliefs. Process and outcome efficacy beliefs have been shown to be separate indicators across multiple levels of expertise in various team and individual sports (Fransen et al., 2014). Process efficacy beliefs are "confidence in the team's ability to accomplish processes that could lead to success," while outcome efficacy beliefs are "confidence in the team's ability to obtain a goal or win a game" (p. 2). For coaches and other practitioners, focusing on process efficacy beliefs provides the best foundation for influencing

efficacy beliefs through interventions, because outcomes like wins and losses are often out of the control of athletes and coaches as a result of refereeing decisions, an outstanding performance by the opponent, or just bad luck, among myriad factors. The history of sport is full of teams who "outplayed" their opponent based on statistics and still lost the competition, and soccer offers many clear examples of this phenomenon. For instance, in the 2019-20 English Premier League season, the 19th-place Watford and 20th-place Norwich City teams were able to win games against second-place Manchester City and third-place Manchester United with an average of a 2-to-1 disadvantage in possession time and total shots, and a nearly 3-to-1 disadvantage in shots on target (Premier League, 2020a, 2020b). Collective efficacy beliefs could explain in part the persistence and resilience of teams that rarely had the ball and faced an overwhelming number of shots on their goal.

Maximizing overall efficacy beliefs for individual athletes and teams requires coaches and practitioners who recognize both process and outcome efficacy beliefs in sport. However, the recognition and measurement of efficacy beliefs alone does not give those practitioners the tools to influence beliefs. As discussed in Chapter 1, efficacy beliefs are built through the interpretation of efficacy information (Feltz et al., 2008). In turn, efficacy information can come from multiple sources, with each source having a relative influence based on the domain (Bandura, 1997). The next section will examine how mastery experience, vicarious experience, verbal persuasion, and physiological and affective states influence self-efficacy beliefs in sport. This will be followed by an examination of how those four sources along with group leadership and group cohesion influence collective efficacy beliefs in sport.

Sources of Self-Efficacy Beliefs in Sport

Mastery experience has frequently been cited as the most influential source of self-efficacy beliefs, across multiple sport domains. According to Bandura (1997), this is because mastery provides athletes with the most convincing evidence that success is possible. Researchers tend to agree, having conducted studies of individual athletes in the sports of triathlon (Antiss et al., 2018; Heazlewood & Burke, 2011) and cycling, running, and swimming (Antiss et al., 2018). This suggests that for coaches and leaders, creating consistent opportunities for athletes to succeed can have a large impact on their self-efficacy beliefs.

Despite the importance of mastery experience, those experiences do not directly increase self-efficacy beliefs, but are mediated by interpretation (Bandura, 1997). There are several factors that can be mediators. Individual goals set before a performance are a good example: individual athletes may perform well but fall just short of achieving a desired performance goal and view the experience as a failure, with negative consequences for self-efficacy beliefs. Other athletes may set identical performance goals but feel encouraged by how close they came to achieving them and see positive consequences for their self-efficacy beliefs (Feltz & Lirgg, 2001; Feltz et al., 2008).

Likewise, attribution can affect the influence of mastery experience on self-efficacy beliefs, by shifting where the individual places credit for the performance (Bandura, 1997). Researchers have found that athletes who perceived the reasons for their performances as stable, generalizable, and personal reported higher self-efficacy beliefs (Coffee & Rees, 2008; Greenlees et al., 2007). In other words, an outcome attributed to luck will have a limited positive influence on self-efficacy beliefs when compared to an outcome attributed to stable, personal factors like hard work, effort, and persistence. Attribution can also create a “spiral” effect in the

relationship between assessment of past performance and self-efficacy beliefs, creating upward or downward momentum (Lindsley et al., 1995, p. 651). Athletes who consistently attribute performances to uncontrollable sources can see decreases in self-efficacy beliefs, which then increases the likelihood that they will attribute their next performance to the same causes, causing a downward performance spiral.

Self-efficacy beliefs in sport are influenced by *vicarious experiences* as well, which involves the observation of self-modeling by the individual athlete, observation of other athlete models, or use of imagery (Bandura, 1997; Maddux, 1995). In the video realm, technological advances in the ability to create and share video provide athletes with almost unlimited opportunities to view performances of themselves and others at all levels of expertise in their chosen sport. Although research suggests that vicarious experience is less powerful than mastery experience, there are additional factors which can enhance the influence of this source (Feltz & Lirgg, 2001).

For instance, when choosing observational models to enhance self-efficacy beliefs, research recommends consideration of the model credibility, ability level, and physical similarity (Bandura, 1997; Feltz et al., 2008). The credibility of the model is important because the performer must believe that the skill they are watching is being executed properly. The ability level of the model has a more nuanced effect on self-efficacy beliefs, which can be seen in the difference between coping models and mastery models. Coping models, or models who do not execute tasks flawlessly every time, are considered more effective than models who have mastered the task, especially when the task is difficult (Feltz et al., 2008). Physical similarity is also important, especially for physical tasks. As Bandura (1997) asserted, models must be similar to the athlete watching in ways that are relevant to the skill being performed (i.e., the athleticism

of a model is particularly relevant for athletic tasks). Although self-modeling (i.e., watching oneself perform on video) could be considered the highest level of physical similarity and can also increase efficacy beliefs through enhanced athlete motivation (Bandura, 1997), research does not show significant superiority for self-modeling interventions over other forms (Feltz et al., 2008). For coaches, this suggests that both self- and other-modeling methods can increase self-efficacy beliefs, but in different ways, and for different levels of task difficulty.

Imagery is another form of vicarious experience that may increase self-efficacy beliefs for athletes, across multiple sports (Feltz & Landers, 1983). Some researchers have proposed imagery as a separate source of efficacy beliefs (Maddux, 1995), and others consider it part of vicarious efficacy information (Bandura, 1997). Regardless, the type of imagery used is important, and multiple studies have reported that using motivational general-mastery imagery, which emphasizes athletes visualizing themselves being focused and confident in generalized sport situations, has significant positive impact on efficacy beliefs (Munroe-Chandler & Guerrero, 2017; Shearer, Mellalieu, et al., 2009; Shearer et al., 2008). Bandura (1997) referred to visualization techniques as "cognitive enactment" and described how skillful visualization can have psychoneuromuscular effects, causing the body to react as if it were actually performing the activity being visualized (Shearer, Mellalieu, & Holmes, 2009). Bandura (1997) also emphasized the importance of the skillful use of imagery by the individual: skillful visualizers see more of an increase in efficacy beliefs than novices. Imagery can therefore have effects on self-efficacy beliefs that are similar to physical practice, but for maximum benefit, practitioners should consider the type of imagery and experience level of their athletes before implementing imagery interventions.

Verbal persuasion is the third source of self-efficacy beliefs to consider in athletes. Verbal persuasion can come in multiple forms in a sport setting, including feedback from coaches and peers, support from family and friends, and self-talk (Samson, 2014). Additionally, researchers often consider goal setting from external sources like coaches, effort attributions, and pregame/halftime speeches to be sources of verbal persuasion (Feltz & Lirgg, 2001; Vargas-Tonsing & Bartholomew, 2006). Regardless of the specific type of verbal persuasion being used, the knowledgeability and credibility of the source is important.

For instance, verbal encouragement to an athlete from a parent who knows little about a sport will be less influential than that of an expert coach (Bandura, 1997). Likewise, challenging goals set by a coach can increase self-efficacy beliefs, but only if the athlete trusts that the coach is knowledgeable and has belief that the athlete can accomplish the goal (Feltz & Lirgg, 2001). In a study that examined both types of coaching behaviors (verbal persuasion and goal setting), Vargas-Tonsing et al. (2004) found that collegiate athletes ranked verbal persuasion and the setting of specific goals as fourth and fifth of 13 measures of coaching behaviors for strengthening self-efficacy beliefs.

Forms of verbal persuasion can also be differentiated as informational or motivational (Wright et al., 2016). Informational persuasion provides guidance and encouragement for the performance of a particular task, while motivational persuasion is more focused on managing emotions (Antiss et al., 2018). For example, athletes in technically demanding sports like gymnastics may thrive on informational verbal persuasion, while athletes in sports that rely on maximum effort like rowing may see more gains in self-efficacy beliefs from motivational verbal persuasion. Both of these types of verbal persuasion information can also be provided through

self-talk, which has been shown to strengthen self-efficacy beliefs in triathletes (Thelwell & Greenlees, 2003) and soccer players (Damato et al., 2011).

Verbal persuasion is theorized to be less influential than mastery and vicarious experiences in most domains (Bandura, 1997; Maddux, 1995). This may be in part because verbal information is transitory and can be forgotten quickly (Bandura, 1997). Despite this, recent research has shown that for university students performing three novel sports tasks, only the verbal persuasion intervention increased beliefs, while vicarious experience interventions were not significant influencers (Wright et al., 2016). This finding was also supported in a qualitative study of runners preparing for a marathon, who reported that their efficacy beliefs were more influenced by verbal persuasion (e.g., "my mom and sister are very supportive") than vicarious experience (e.g., "my friend did this last year"; Samson, 2014, p. 168). Indeed, the research shows that verbal persuasion can be applied to enhance self-efficacy beliefs through an understanding of personal, contextual, and cognitive factors (Van Raalte et al., 2016). For coaches and leaders, strengthening self-efficacy beliefs requires understanding how athletes will interpret verbal persuasion information in the context of their personalities and the task they must perform. This understanding of interpretation and context is also important for physiological and affective self-efficacy information.

Physiological and affective sources of self-efficacy information have always been important in sports. Researchers posit that the physical nature of athletic competition could be one reason for this importance, because physiological efficacy information has the most direct connection to performance in this domain (Bandura, 1997; Feltz & Riessinger, 1990). However, physiological and affective responses in sport settings do not directly influence self-efficacy

beliefs. Instead, it is the way athletes interpret physical arousal and emotional moods that leads to stronger or weaker self-efficacy beliefs (Bandura, 1997; Feltz et al., 2008).

Researchers assessing the interpretation of physiological and affective information focus on the magnitude of the response (i.e., strong or weak) as well as the direction (i.e., positive or negative; Mellalieu et al., 2006). A physiological indicator like elevated heart rate before a competition could be a sign of excitement and anticipation for one athlete, but a sign of anxiety and worry for another. Likewise, unexpected fatigue during an event may indicate to one athlete that they are exerting a maximum effort and should be successful, while another athlete might be discouraged by not feeling at their best.

Indeed, as athletes compare their *actual* physiological state with their *expected* state throughout a competition or event, they are interpreting physiological responses based on the magnitude of the discrepancy between actual and expected feelings, and whether they feel better or worse than expected (Antiss et al., 2018). Feeling worse than expected could weaken self-efficacy beliefs, while feeling better than expected could strengthen self-efficacy beliefs. This has also been supported qualitatively for marathon athletes through pre-race interviews (Samson, 2014), where athletes with high levels of self-efficacy belief reported "feeling better than I thought" and "being in better shape than I thought before the race" (p. 170).

When athletes are placed into team environments, the context for their interpretation of efficacy information, regardless of source, becomes more complicated. So, how do mastery experiences, vicarious experiences, verbal persuasion, and physiological and affective states influence efficacy beliefs for groups of athletes? Are there other sources of efficacy beliefs that are unique to this collective sports environment?

Sources of Collective Efficacy Beliefs in Sport

Although differing in the level of agency (individual v. collective), researchers theorize that self- and collective efficacy beliefs "have similar sources, serve similar functions, and operate through similar processes (Bandura, 1997, p. 478)." This is because, as Bandura (2006) asserted, individual judgments of self-efficacy beliefs in a team environment cannot be detached from the activities of other team members. This is especially true in the interdependent realm of team sports, where the technical or tactical ability of a teammate to perform their role, such as passing the ball or providing defensive cover, can have a direct bearing on the outcome of a contest. Researchers characterize this type of belief as *other-efficacy* when it is the perception of the individual efficacy of a teammate or partner (Habeeb et al., 2017). Teams with strong collective efficacy beliefs have individuals with strong self-efficacy beliefs, but also individuals who have strong belief in those around them. As Bandura (1997) pointed out, a team full of self- (and other-) doubters will rarely become a high-performing group.

Despite the importance of understanding efficacy sources for designing interventions to increase efficacy beliefs (e.g., Vealey et al., 1998), most of the research into collective efficacy beliefs in sports focuses on measuring the strength of the beliefs themselves or their relationship to performance (e.g., Gully et al., 2002; Stajkovic et al., 2009). Also, there are few studies that explore how established sources of self-efficacy beliefs might translate into sources of collective efficacy beliefs in sport (Magyar et al., 2004). It is important to discuss which sources of collective efficacy beliefs have been studied in sport settings and whether they are an extension of self-efficacy beliefs, or something distinct.

First, past performance has been cited as one of the most important sources of collective efficacy beliefs in sports like ice hockey (Feltz & Lirgg, 1998; Myers et al., 2007); basketball (Chase et al., 2003); and handball (Ronglan, 2007). In part, this is because past performance can

be interpreted as mastery experience, providing objective evidence that a team can succeed in a designated task (Beauchamp et al., 2012). These findings were also supported within soccer games by Fransen, Decroos, et al. (2015) who reported that perceived performance in the first half was correlated with halftime collective efficacy beliefs ($r = .31$, $p < .01$) and perceived performance in the second half was correlated with postgame collective efficacy beliefs ($r = .34$, $p < .01$). The study also found that the correlation of pregame collective efficacy beliefs with first half performance was not significant. This result suggests that without recent past performance to draw on, confident teams did not always perform well. Combined, these studies suggest that an emphasis on past successes could be a form of mastery experience that improves collective efficacy beliefs in short- and long-term scenarios.

As with self-efficacy beliefs, researchers have found that attribution modifies the relationship between collective efficacy beliefs and their sources (Rees et al., 2005). The more that team members attribute their successful performances to their own mastery, not to luck or other uncontrollable factors, the more confidence they will derive from that experience (Greenlees et al., 2005; Rees et al., 2005). Attribution could also serve an important function through its impact on emotions, as theorized by Allen et al. (2009). In a study of college athletes, Allen et al. (2009) found that attributions for team successes based on controllable factors contributed to positive emotion and subsequently higher collective efficacy beliefs. Murray et al. (2020) supported this view, finding that attributions of team capability after victory, when combined with a strong sense of team identity in individual players, led to stronger collective efficacy beliefs. This research suggests that positive, controllable attributions after a successful performance can bolster collective efficacy beliefs through perceptions of mastery and positive

emotions, especially in a cohesive group. There will be more discussion of the relationship between group cohesion and collective efficacy beliefs later in this section.

Mastery experiences can also be combined with vicarious experiences through observational interventions (Bruton et al., 2014). Although vicarious experience is generally considered a weaker source than mastery experience (Feltz & Lirgg, 2001), Bruton et al. (2014) theorized that mastery experiences could be replicated through a vicarious intervention if athletes are watching themselves perform well. Additionally, because collective efficacy beliefs are affected by how an individual perceives themselves *and* their teammates, watching video of teammates can also be an effective intervention (Shearer, Mellalieu, et al., 2009). These conclusions were supported by Bruton et al. (2014) who found that collective efficacy beliefs for college-aged athletes increased the most when teams were shown positive video (compared to neutral and negative), and when they were watching themselves (compared to unfamiliar teams).

Imagery interventions, previously discussed as both a separate source of efficacy beliefs or as part of vicarious experience, are also purported to provide mastery and vicarious experiences to groups. For youth soccer athletes, Munroe-Chandler and Hall (2004) found that imagery interventions improved collective efficacy beliefs for certain positions on the field, specifically midfielders and forwards. Adding more detail to the examination, Shearer et al. (2007) found that motivational general-mastery imagery had the most significant effect on collective efficacy for adults who were considered "elite" athletes, and no significant impact for those considered "non-elite". These results have received further support in basketball (Bruton et al., 2014), as well as in softball, volleyball, hockey, and soccer (Short, Tenute, & Feltz, 2005).

Verbal persuasion is often cited as less important among sources of collective efficacy beliefs (Bandura, 1997; Chase et al., 2003) but there is some evidence that its importance in sport

settings could be higher than in other domains. One reason for this supposition is that there are numerous ways for sports teams to experience verbal persuasion. Teams may receive information from optimistic or pessimistic fans or media, from comparisons with other teams, and from watching how their teammates respond to persuasive information (George & Feltz, 1995). Although researchers have not reported on verbal persuasion as a source of collective efficacy beliefs in isolation, this could be because it is often conceptualized as part of other constructs such as group leadership and group cohesion, which are examined in the following section.

Bandura's (1977) fourth source of efficacy information, physiological and affective states, may also be difficult to isolate for groups without discussing other emergent group constructs like group cohesion and leadership. This is because measuring how a team feels physically and emotionally overall depends on individual team members being aware of those physical and emotional indicators in others (Petitta et al., 2015). Any judgement made by an individual will be influenced by the relations between teammates and the performance climate in which the judgement occurs. To complete this analysis of collective efficacy sources, it is necessary to further examine the performance climate created by team leaders and the task and the cohesion of their teams.

Group Leadership. Team performance environments vary across sports, for different levels of competition within sports, and across different collegiate athletic departments. Of interest for this research, the organizational culture of an academic institution and its athletic department, and down to each team typically includes "the rituals, norms, and priorities of an organization; the styles of behaviors it rewards and penalizes; and the types of attitudes and behaviors that are modeled" (Bandura, 1997, p. 474). Because of the differences in culture across

various sports, it makes sense to consider each team as its own organization. For instance, the rituals and social norms associated with American football will be different from those in soccer. Using the team as the unit of analysis also allows research into how individual coaches and peer leaders influence their specific team environment.

Recent research has shown that peer leader behaviors that are perceived as confident and competent predict higher collective efficacy beliefs (Watson et al., 2001; Fransen et al., 2014; Fransen, Vanbeselaere, et al., 2015; Fransen et al., 2016; Fransen et al., 2017; Watson et al., 2001). In these studies, the researchers found that peer leader behaviors across several team sports (e.g., hockey, netball, soccer, rugby) from high school to professional level that were perceived to be confident (Fransen et al., 2014; Fransen, Vanbeselaere, et al., 2015; Watson et al., 2001) and competent (Fransen et al., 2017; Fransen et al., 2016) predicted higher collective efficacy beliefs for team members. An important limitation is that the first two Fransen studies (Fransen et al., 2014; Fransen, Vanbeselaere, et al., 2015) were based on sport tasks that were isolated from game situations (i.e., free throws for basketball and shooting/dribbling tasks for soccer) which make them difficult to translate to the dynamic and interdependent environment in game situations. Also in those studies, the leaders who were being evaluated for the effects of their confident behaviors were confederates. The fact that these leaders were strangers to the other athletes suggests that their confidence could have been misinterpreted or misjudged based on the athletes' lack of familiarity with their new leaders.

Researchers have also emphasized the importance of coach leadership for collective efficacy beliefs in sport. For example, Price and Weiss (2013) found that coach leadership was more important than peer leadership for collective efficacy beliefs among adolescent soccer players, and when coach leadership was examined by itself, it was found to account for 26% of

the variance in collective efficacy beliefs for college-aged soccer players (Hampson & Jowett, 2012). Additionally, Atkinson et al. (2017) reported that collegiate soccer players saw the greatest gains in collective efficacy beliefs when they believed their coaches were confident motivators who could devise successful game strategies. Although it was beyond the scope of this research to consider the relationship of different leadership styles (i.e., transformational, leader-member exchange) to collective efficacy beliefs, the overall perception that athletes have of peer and coach leadership effectiveness may explain some of the variance associated with those beliefs.

Another way coaches and peer leaders can influence collective efficacy beliefs is by creating the "situational goal structure" of their competitive environment by selecting which types of behavior are praised and rewarded (Heuze, Sarrazin, et al., 2006, p. 202). Goal structure is based on achievement goal theory (Ames, 1992), in which the competitive environment can be either mastery-oriented (i.e., task-focused) or performance-oriented (i.e., ego-focused). In mastery-oriented motivational settings, athletes are encouraged to make mistakes and progress toward mastery. In these environments failure is not only tolerated, but often rewarded. In performance-oriented motivational settings, athletes are encouraged to compete with their teammates and measure their success by winning or losing based on an objective measure (Heuze, Sarrazin, et al., 2006).

In multiple studies of professional handball, professional netball, and high school rowing teams, coaches who created an environment focused on mastery rather than performance were found to have teams with higher collective efficacy beliefs (Heuze, Sarrazin, et al., 2006; Magyar et al., 2004). These findings were supported by Kao and Watson (2014) who reported increased collective efficacy beliefs for cheerleading partnerships when their environment was identified

primarily as a mastery climate, where the coach supports "effort, cooperation, and [places] emphasis on learning and task mastery" (p. 594). Although leaders, and especially coaches, may feel pressure to win, collective efficacy beliefs are theorized to be most enduring when built in an environment that emphasizes long-term individual and team development over short-term competitive success (Bandura, 1997).

Group Cohesion. According to Bandura (1997), teams that are cohesive have players who "stick together, are united in their aspirations, and have a strong sense of collective identity" (p. 404). These qualities could be translated as strong personal relationships, shared goals, and a strong sense of team. All three have been studied in sport settings and provide evidence for the importance of coaches and leaders who can create environments that enhance these qualities.

Personal relationships are vital for strong collective efficacy beliefs, especially in sport settings where interdependence among teammates is high (Gully et al., 1995; Jowett, 2007). Indeed, after controlling for variance in collective efficacy beliefs from coach leadership behaviors like instructional style, Hampson and Jowett (2012) were able to attribute an additional 9% of variance in collective efficacy beliefs to the strength of the coach-athlete relationship. Bell and Riol (2017) examined this construct in a collegiate basketball environment, confirming that collective efficacy beliefs are strengthened by coaches who can communicate with players from multiple cultures. This finding is important in American college sports, as the ethnic diversity of rosters increases each year (NCAA, n.d.-c).

Among studies that have examined the direct relationship between group cohesion and collective efficacy beliefs in sport, there is substantial evidence that task cohesion is more predictive of beliefs than social cohesion (Kozub & McDonnell, 2000; Paskevich et al., 1999). For instance, Paskevich et al. (1999) found that college-aged volleyball players with higher

perceptions of group task integration and group task attraction were more likely to hold high collective efficacy beliefs. Both studies used the Group Environment Questionnaire to assess group cohesion (Carron et al., 1985). In addition to supporting these findings, Heuze, Fontayne, & Rimbault (2006) found that for professional basketball players, group social integration was also predictive of increased perceptions of collective efficacy. Although this evidence suggests a focus on task-related cohesion to improve collective efficacy beliefs, there is more work to be done in different sports to confirm this conclusion.

Another area where coaches and other leaders can influence beliefs through cohesion is by creating a shared understanding of expectations and a shared belief in the direction of the team (Fransen, DeCroos, et al., 2015). The importance of coaches and peer leaders who foster a shared concept or team identity was also supported by Filho et al. (2015) in their study of the relationship between cohesion, team mental models, and collective efficacy beliefs for collegiate soccer players. Team mental models are the "collective task and team-relevant knowledge that team members bring to a situation" (Cooke et al., 2003, p. 153). Filho et al. (2015) found that team mental model scores were correlated positively with collective efficacy beliefs, suggesting that a performance environment designed to increase shared knowledge and communication in a team could also enhance collective efficacy beliefs.

Although collegiate athletes are often participants in studies that investigate the relationship between efficacy beliefs, their sources, and performance, there are currently no studies that examine how those relationships may be moderated by factors unique to the college environment. The following section will reconsider some of the research already presented, but in the context of how the college-specific factors of academic demands, social context, and structural factors may influence self- and collective efficacy beliefs and their sources.

Efficacy Beliefs in College Sport

Student-athletes are a unique segment of the collegiate population (Stone, 2012). As individuals and in teams, student-athletes gather efficacy information from mastery experiences, vicarious experiences, verbal persuasion, and physiological and affective states. Additionally, there is evidence to suggest that for collegiate teams, collective efficacy beliefs are influenced by leadership behaviors and group cohesion. Efficacy beliefs in turn impact how student-athletes apply the skills they have developed during their youth careers and the skills they acquire as collegiate athletes (Bandura, 1997). To apply these skills, athletes must manage the academic, social, and structural factors that are present in the college environment (G. Wilson & Pritchard, 2005). Although researchers frequently include collegiate athletes in their studies, there are no collective efficacy instruments that assess how these college stressors impact reported collective efficacy beliefs. The next three sections will examine this relationship.

Academic Factors

In addition to their social identity, student-athletes are also managing their academic identity and expectations from coaches, parents, and administrators (Yukhymenko-Lescroart, 2014). Academic requirements can create stress for student-athletes in various ways, regardless of what sport they play or what school they attend (Cosh & Tully, 2015). For instance, in some institutions athletic prowess can be a factor in admitting student-athletes with less accomplished academic backgrounds than their non-athlete peers (Harris et al., 2003). Researchers suggest two potential reasons for these less impressive academic resumes: commitment to sport development in high school could compromise the time spent on academic achievement (Comeaux & Harrison, 2011), or student-athletes might not have the skills to succeed academically at the college level (Huml et al., 2019).

Regardless of the reason for the academic resumé discrepancy, non-athlete students and faculty might resent this perceived lowering of standards in admissions and preferential status granted to student-athletes (Engstrom et al., 1995; Huml et al., 2019). This problem can often have a ripple effect for the preponderance of student-athletes who are competent by setting lower expectations in the classroom (Stone, 2012), casting doubt on whether they truly earn their grades, and affecting their beliefs about their ability to be academically successful (Aries et al, 2004; Cosh & Tully, 2015). Most of the recent research into student-athlete academics has focused on the reasons for underperformance and how to create more robust academic support systems for student-athletes (Antshel et al., 2016; Huml et al., 2019). Although the causal relationship between athletic stress and academic performance is well-documented, there is no research into the reverse relationship. Coaches would benefit from understanding the reciprocal nature of this relationship and being able to structure their programs to account for academic stressors.

Further complicating the picture for student-athletes that lack academic competence is the unique emotional pressure they may feel due to the demands on their time from athletics and frequent absence from campus (Ting, 2009). It is not unusual for a college athlete in their competitive season (i.e., fall/winter/spring term) to miss 1–2 days of classes in a single week on multiple occasions throughout a 10–14-week period. Although many institutions provide academic support within the athletic department and work to mitigate the effects of the missed class with instructors, it is often difficult to hold the student-athlete to the same standards as non-athletes (Cosh & Tully, 2015). This perceived or actual discrepancy in academic standards can make it harder for student-athletes to adjust to college and to obtain the same educational value

as their peers. The tension between athletic and academic identities can also lead to depression or anxiety for student-athletes trying to meet divergent expectations, an emotional risk that is often exacerbated by the expectations for high achievement that the student-athletes place on themselves (Beauchemin, 2014; Killeya-Jones, 2005). Overall, a team of student-athletes who are struggling to meet academic expectations and remain eligible for sports competition is unlikely to exhibit high levels of collective efficacy beliefs.

Social Factors

Collegiate athletes must also balance their athletic identity with a social identity that is often shaped by increased scrutiny from peers and professors on campus (Parcover et al., 2009). As a result, researchers have focused on designing counseling systems and interventions that support the integration of social and athletic demands for student-athletes and help student-athletes feel comfortable seeking help for the stress they feel (Beauchemin, 2014; Despres et al., 2008). However, as with academic demands, there is no research into the reciprocal relationship, or how the social context of college life influences sources of collective efficacy beliefs and performance in college teams.

In most NCAA institutions, new student-athletes must navigate a socialization process within both their college community and their athletic teams. Socialization is the "interaction process by which the group (i.e., society, community, formal organization, team) teaches its members the characteristics, knowledge, skills, values, and norms deemed appropriate" (Marx et al., 2008, p. 2). In the collegiate sport setting, this process often takes the form of team rituals, mentorship from coaches and peers, and demonstration of norms by older, more experienced team members. For many new student-athletes, the norms being demonstrated will differ from

their previous scholastic and club sport experiences and could contribute to the stress of their adaptation to college life.

Robust socialization support at both the athletic department and team level can mitigate this stress. For example, the creation of psychoeducational groups has been shown to be effective at providing a sense of community for student-athletes by creating a robust network of peer role models to accelerate the socialization process within the athletic department (Harris et al., 2003). Without this network of role models, student-athletes may struggle to reconcile their athletic identity with their social identity, which could have a negative effect on group cohesion.

Group cohesion in team sport has already been discussed in this paper as a combination of personal relationships, shared goals, and shared or team identity (Bandura, 1997). Personal relationships are often affected by the college environment through the unique social network in which student-athletes live. In college settings, athletes may live with other athletes for their entire college career, whether they are teammates or from other sports. Even when they do not live together, collegiate athletes spend significant amounts of time together while practicing, weight training, attending study hall, traveling, eating team meals, and attending team meetings. All of this social contact adds to the normal interaction on campus in classrooms and in purely social settings like off-campus meals and parties. The result is that student-athletes have a unique opportunity to build strong social bonds and team cohesion but are also uniquely vulnerable to interpersonal schisms that may start small and multiply given the number of interactions possible on a given day. An additional challenge to group cohesion and strong collective efficacy beliefs is the structure of collegiate athletics, which creates teams that replace their entire roster every 4–6 years as athletes exhaust their NCAA eligibility.

Structural Factors

In college sports teams, the roster is almost never composed of the same athletes for two consecutive seasons. The influx of freshmen and departure of seniors each year as they begin or complete their academic careers creates a challenge for the development of group attributes like collective efficacy beliefs. Additionally, athletes may transfer in and out of teams, and there can be unexpected attrition due to academic ineligibility or disciplinary issues. The overall experience level of a college team fluctuates and with it the identity of the team and its cohesiveness can change.

Although evidence suggests that groups who remain intact longer will have stronger collective efficacy beliefs than those who change composition frequently (Carron & Eys, 2018), there is only one study that attempted to quantify this phenomenon in athletic teams (Aristotelis et al., 2013). In a study of athletes 13–38 years old, the researchers reported no differences in group cohesion when measured for varied levels of experience from youth to professional and number of years playing for their team. However, this study did not examine whether entire teams had been together for multiple years, or report results by age group, so further research could provide insight into how a collegiate group dynamic should be characterized.

Student-athlete satisfaction is often a key component of retention in a particular team. For a sample of NCAA Division I student-athletes, J. E. Johnson et al. (2013) found that the amount of playing time a student-athlete received was the most powerful predictor of overall satisfaction (especially following the freshman year). This finding could be due to the reinforcement of the athletic identity that follows from having a significant role on the team. The same research also reported that student-athlete retention was enhanced by playing a non-revenue sport (i.e., not basketball or football); being close to home (within 200 miles); and being Caucasian. Possible reasons for these findings mentioned by the researchers are that (a) academic performance is

lower for athletes in revenue-generating sports, leading to academic ineligibility; (b) being far away from home leads to homesickness and lack of connection with high school friends; and (c) non-Caucasian athletes make up a higher proportion of participants in revenue-generating sports, which can jeopardize retention, as noted previously (J. E. Johnson et al., 2013). Although multiple academic factors were shown to correlate with student-athlete retention rates (e.g., high school GPA, high school class rank, and standardized test scores), none provided predictive value. For coaches, understanding the factors that increase student-athlete retention beyond the freshman year could be a key component of strengthening group cohesion and collective efficacy beliefs.

Although the entire career of a student-athlete is only 4–6 years, each individual season is often much shorter than seasons played by youth and professional athletes. In college soccer, for instance, the season begins in mid-August and teams are playing in their national (NCAA) tournament 3 months later, by mid-November (NCAA, 2020b). With a possible 20 regular season competitions and a relatively small percentage of NCAA soccer teams qualifying for the national tournament in their respective divisions (i.e., 48 of 206 in Division I men's soccer and 64 of 333 in Division I women's soccer) coaches and players feel pressure to win every game. This pressure could lead coaches to create an ego-oriented climate that emphasizes winning over a mastery-oriented climate that emphasizes individual player and team development. As discussed previously, ego-oriented climates are thought to weaken collective efficacy beliefs in cheerleading teams (Kao & Watson, 2014) and soccer teams (Blecharz et al., 2014). This pressure could be even greater in revenue-generating sports like basketball, where millions of

dollars may be earned by qualifying for and progressing through NCAA national tournaments (Kotchen & Potoski, 2014; Phillips et al., 2015).

The lack of preparation time between matches in such a condensed schedule can impact mastery experiences as well. For example, most of the training for a college soccer team consists of a light physical and mental load for the day-before-game preparation practice, the same for a day-after-game recovery practice, or actual games. This implies that meaningful mastery experiences, where there are several variables that are dynamic and uncontrollable, is often only possible once or twice a week, occurring only during the games (Bandura, 1997). Despite this, the density of games on the college calendar (one game every 72–96 hours) suggests that a successful past performance could still be fresh in the minds of the athletes as they prepare for the next match, which would strengthen collective efficacy beliefs (Bandura, 1997).

The limited time between competitions can also make it difficult to find time for interventions designed to provide vicarious experiences to teams. In the 20 hours allowed per week by the NCAA for countable athletically related activity, there is limited opportunity for video sessions where student-athletes can watch video of themselves and others, while still allowing time to apply the lessons learned (NCAA, 2019b). Imagery, another form of vicarious experience, can also be challenging to use in an effective manner, as student-athletes are often arriving at training or at games immediately following class, an exam, or other activity that is unrelated to athletic performance. Overall, the short and competition-heavy structure of college sports seasons could exacerbate the stress student-athletes experience, with negative consequences for collective efficacy beliefs.

Background Factors

Beyond academic, social, and structural factors, there are other factors which can help to predict the influence of sources of collective efficacy beliefs. For the purposes of this study, these were called background factors, and consisted of year in school of the student-athlete, head coach tenure, and size of the institution (student population). Background factors could enhance the predictive value of the sources of collective efficacy beliefs by altering how student-athletes interpret information from those sources. For instance, second-year soccer players at small schools with a first-year head coach may show different levels of confidence in their team's ability to perform than fifth-year seniors at large schools with coaches entering their 15th season. These differences may manifest for various reasons.

First, the experience level of individual student-athletes may affect their belief in the ability of their team. This background factor could affect collective efficacy beliefs in two opposing ways. For instance, Marx et al. (2008) showed that student-athletes identify more with their athletic identity and team as they go further in their college careers. This increased identification could result in higher levels of commitment to the team and stronger collective efficacy beliefs. Additionally, athletes with less experience may not know their teammates and coaches as well, and a naive optimism could lead to higher levels of confidence in the ability of the team to perform. Conversely, student-athletes in their third or fourth year on the team have more knowledge about the capabilities of the team and the coach, along with the expected level of support from the athletic department and the strength of their typical opponents. This experience could strengthen collective efficacy beliefs in teams that have had recent success or weaken those beliefs in teams that have not performed well in the past.

Second, the tenure of the coach may affect team efficacy beliefs through the performance environment. Coaches with fewer years of experience at an institution may feel more pressure to

win and establish themselves as good coaches, leading to an ego-oriented environment. As noted previously, multiple researchers in sports like professional handball and netball (Heuze, Sarrazin, et al., 2006), rowing (Magyar et al., 2004), and cheerleading (Kao & Watson, 2014) have found that teams in mastery-oriented environments have stronger collective efficacy beliefs than those in ego- or performance-oriented environments. Additionally, coaches who have not been in their positions long have not had as much opportunity to gain the trust and belief of their athletes. As shown by Atkinson et al. (2017) with collegiate soccer players, athletes' belief in the ability of their coach to motivate and devise successful strategies had a significant influence on the team's ability to prepare, unite, and persist during a game.

Third, the population of a school may predict collective efficacy beliefs through its effect on student-athlete identity development. As previously noted by multiple researchers, student-athletes must balance their athletic identity with their student identity as they move through their collegiate careers (Stone, 2012; Yukhymenko-Lescroart, 2014). This balance is often difficult to achieve, given the pressures of academic performance (Cosh & Tully, 2015) and the athletic expectations from coaches and other administrators (J. E. Johnson et al., 2013). There is also evidence to suggest that athletes form their own subcultures and spend significantly more time with their teammates than with other students when not participating in sport-related activities (Aries et al., 2004). At larger schools, these subcultures may be more prevalent, leading to behaviors that that negatively affect collective efficacy beliefs and performance, such as the tendency to hide emotional and mental health issues (Beauchemin, 2014) and hinder the development of relationships with non-athlete peers and faculty (G. Wilson & Pritchard, 2005).

Measurement of Efficacy Beliefs

Efforts to generalize collective efficacy belief measurements in sport have often ignored contextual indicators like academic, social, and structural factors that may help practitioners design interventions. Although there are multiple examples of instruments created for specific sports, the items used measure efficacy beliefs only for performance tasks associated with sports like college basketball (e.g., rebound effectively; Bray et al., 2002); American college football (e.g., execute in the red zone; Myers et al., 2004); and professional basketball (e.g., handle the ball against pressure; Heuze, Fontayne, & Rimbault, 2006). Even instruments designed to be generalizable to all sports can only be considered generalizable with respect to preparation for, and performance of, sport *tasks* (Short, Sullivan, & Feltz, 2005). The items in these instruments may therefore have limited predictive value in unique environments like collegiate athletics, and in sports with different cultures, different levels of interdependence, and different amounts of technical proficiency required.

For instance, although researchers assert the importance of coach and peer leadership in creating a team motivational climate, they stop short of discussing the factors that influence how that environment is created, or why it may be performance-oriented rather than mastery-oriented (e.g., Blecharz et al., 2014). Team cohesion studies that examine the relationship between social and task cohesion and collective efficacy beliefs mention the difference between college and youth/professional settings without exploring how this difference might impact collective efficacy beliefs (Heuze, Fontayne, & Rimbault, 2006). And although there is research that explores the efficacy beliefs of college students and research identifying the challenges student-athletes face when balancing academic, social, and athletic commitments (Beauchemin, 2014;

Despres et al., 2008), there is no examination of which of these factors are the most influential for student-athlete collective efficacy beliefs.

Despite the relative lack of evidence for contextual effects on efficacy beliefs in athletics, two researchers have attempted to address the impact of sociocultural context on athletic performance. Vealey et al. (1998) found that the importance of certain sources of individual sport confidence, like *social support* and *physical self-presentation*, varied across different types of sports (i.e., team and individual), levels of sport (i.e., high school and college), and gender. They hypothesized that these differences are in part due to differing organizational sport cultures but did not report on which aspects of those cultures may be most influential. Hays et al. (2009) also saw differences in individual confidence between genders when studying Olympic athletes, suggesting that females were more susceptible than males to decreased confidence from lack of social support and high expectations. At the highest levels of sport performance, it is therefore hypothesized that successful performance can lead to enhanced expectations and has negative effects on efficacy beliefs. This evidence could have implications for collegiate athletes at the highest level of their respective sports.

Efficacy Beliefs Instruments

Sources of Sport Self-Confidence Questionnaire. Multiple researchers have created instruments to predict the strength of self- and collective efficacy beliefs from their sources. Although it does not measure efficacy beliefs, the theoretical foundation for the Sources of Sport-Confidence Questionnaire (SSCQ) is similar to self-efficacy theory (Bandura, 1997), and several conceptual parallels are identified by the researchers (Vealey et al., 1998). Sport-confidence differs from self-efficacy belief in that it is a generalized form of efficacy beliefs in a sport setting and is the "degree of certainty individuals possess about their ability to be

successful in sport" (Vealey et al., 1998, p. 55). Because the SSCQ defines confidence as a belief in general sport ability rather than ability in a specific sport the predictive value is limited, but the research is important for its focus on belief and confidence in a sport setting.

Vealey et al. (1998) found nine sources of sport-confidence in their research for the SSCQ—physical/mental preparation, social support, mastery, demonstration of ability (to external parties), physical self-presentation, environmental comfort, vicarious experience, situational favorableness, and coaches' leadership (p. 68). Clearly, several of the SSCQ sources are identical or nearly identical to Bandura's four sources of self-efficacy (i.e., social support, vicarious experiences, mastery), and Vealey et al. (1998) acknowledge that an argument could be made for nesting each of the nine SSCQ sources under Bandura's four sources. Additionally, the relationship between sources of sport-confidence and sport confidence levels have been further corroborated by more recent studies among master athletes and college-age competitive athletes (Levy et al., 2015; R. C. Wilson et al., 2004).

As a coach, I agree with all of Vealey et al.'s (1998) sources as key components of confidence in athletic performance. However, there is ambiguity in the methodology used to develop the scale that could limit its applicability and usefulness for practitioners in different sports and different sport environments. For instance, the study was conducted in four phases, refining scale items at each phase for reliability and validity. Phases I, II, and III all studied individual sport athletes at the collegiate level, but the phase IV confirmatory factor analysis (CFA) sampled high school basketball athletes. Vealey et al. (1998) addressed this mixed-level sampling in their discussion section but were only able to speculate on the potential reasons for the incongruities in results, such as the difference in the importance of physical self-presentation as a source of sport-confidence.

Additionally, the SSCQ was validated by asking athletes to think back to a time when they felt confident competing in their sport and assess where that confidence came from. Although it could be advantageous to allow athletes maximum flexibility in choosing when they felt most confident, this flexibility also makes it difficult to understand why an individual athlete may have felt that confidence from a particular source. As Bandura (2006) advised, the time between the efficacy belief measurement and the performance should be as short as possible for maximum accuracy and validity. This temporal proximity is not explicitly addressed by the researchers but it seems that athletes may have been describing any time in their sporting career from youth to high school or college, and multiple contextual factors may have changed in the interim.

Collective Efficacy Questionnaire for Sports. In the study of collective efficacy beliefs, the Collective Efficacy Questionnaire for Sport (CEQS) is among the most widely used scales extant. Developed by Short, Sullivan, & Feltz (2005) the CEQS was designed to extend Bandura's (1997) analysis of collective efficacy beliefs and identify sources of collective efficacy beliefs in athletic performance. As Short, Sullivan, & Feltz (2005) explained, "what the literature still lacks is a sport domain measure of collective efficacy that is tailored to team functioning across different sports (p. 184)." Researchers have used the CEQS to measure how collective efficacy beliefs vary based on video interventions for college students on an obstacle course (Bruton et al. 2014), coaching behaviors for collegiate athletes (Atkinson et al., 2017; Hampson & Jowett, 2012), and attributions and social identity for collegiate athletes (Murray et al., 2020). Despite the growing body of evidence featuring the CEQS, there are limitations that should be considered.

CEQS development and validation was similar to that of the SSCQ, consisting of multiple phases. The researchers validated 20 items across five subscales (collective efficacy sources)—ability, effort, persistence, preparation, and unity (Short, Sullivan, & Feltz, 2005, p. 202). Each subscale consisted of four items, measured as recommended by Bandura (2006) on an 11-point Likert scale (0-10). The CEQS was designed for application to any sport, at any level, although the researchers collected their data for validation using only participants from collegiate sports. Despite the claim that the CEQS can be used across multiple sports, the utility of this instrument for all sport settings requires further discussion.

The first concern for this approach is that it does not acknowledge the importance of variance due to levels of task demands (Bandura, 1997). An athlete may feel very confident about their ability to perform a task during a less demanding portion of a match, but less confident as the match continues or goes into a pressure-filled overtime period. Bandura (1997) mentions specifically with respect to personal efficacy beliefs that "measures…must be tailored to domains of functioning and must represent gradations of task demands within those domains (p. 42)." This guidance should apply to measuring team efficacy beliefs as well. Although the CEQS was validated by measuring collective efficacy beliefs based on a well-defined domain (i.e., a single upcoming competition), variance in task demands at the collegiate level is dependent on the type of sport, the level of competition (i.e., Division I, II, or III), and even the time of the season (i.e., early v. late).

Secondly, efficacy information is only meaningful for practitioners if it reveals how much belief the team has that they can apply their knowledge and skills at the appropriate time, in the appropriate way, and in response to variations in the athletic performance environment (Bandura, 1997). The CEQS takes this state-like approach into account in the wording of some

scale items but adopts a more trait-like approach for others, which does not account for changing conditions. For instance, item 19 of the CEQS asks the respondent to assess their team's confidence in their ability to "devise a successful strategy" (Short, Sullivan, & Feltz, 2005, p. 202). This question may have different answers at different points in the competition and does not help us understand the team's belief in their ability to apply various strategies and skills in response to potentially changing weather conditions, score, or other factors. As such, it loses much of its predictive value in dynamic competition scenarios where belief may fluctuate based on those changing conditions. A more useful approach may be to ask athletes about their belief in the ability of the team to devise a strategy after experiencing adversity in a competition, like losing an important player to injury or conceding a goal late in a soccer game.

Additionally, the CEQS fails to distinguish between process-oriented beliefs and outcome-oriented beliefs in its overall efficacy belief score. The problem with combining process and outcome scores is that outcome beliefs are often out of the control of the individual athlete or the team. Also, this definition diverges from SCT and Bandura's (1997) definition of collective efficacy beliefs as the team ability to "organize and execute the courses of action required" (p. 477). This definition does not include belief in the ability of the team to win. This complication was first noted by Fransen et al. (2014), who suggested that the ability subscale was measuring something more accurately termed "team outcome confidence," and that only the effort, persistence, preparation, and unity subscales should be considered collective efficacy beliefs (p. 5).

Observational Collective Efficacy Scale for Sports. After making this point, Fransen et al. (2014) went on to propose a process-oriented observational scale for collective efficacy beliefs, the Observational Collective Efficacy Scale for Sports (OCESS). The OCESS has five

scale items that correspond to their hypothesized five sources of collective efficacy belief, asking participants to "Rate your confidence, in terms of the upcoming game or competition, that your team has the ability to…" (a) react enthusiastically when making a point, (b) have leader figures in the team who believe that we will win this game and express this on the court, (c) have both players in the game and on the bench who cheer enthusiastically, (d) encourage each other during the game, and (e) communicate a lot tactically during the game. These five items demonstrated strong internal consistency (α = .85) and correlated strongly with the four process-oriented subscales of the CEQS (r = .79). Although the researchers found strong support for the validity of the OCESS, there is only one study since that has reported use of the OCESS (Fransen et al., 2016). This could be due to how recent the scale is, or a function of its limitations. The OCESS provides items that coaches can measure through direct observation, and then apply that knowledge during competitions to influence collective efficacy beliefs. However, like other measures of efficacy beliefs, the OCESS is focused on task performance in the competition environment. While this is a useful measure in the short-term, coaches interested in broad-based and durable efficacy beliefs in their teams must consider how they develop teams that communicate tactically, or who encourage each other during the game.

Additionally, the OCESS was validated using collegiate volleyball players, which may limit the generalizability of the results, even for other college team sports. For instance, volleyball features six players on a small court, breaks after every point to come together and encourage each other, and only a few feet of separation from the encouragement of teammates and coaches on the bench. In soccer, which is of interest for this research, the players are often too far away to communicate effectively with each other, there are few breaks where the whole team can come together, and the benches can be as far as 70–80 yards away from the farthest

players. This suggests that an observational scale, although a useful concept, might look very different for other sports.

General Collective Efficacy Scale. Overall, both the CEQS and the OCESS are focused on task-related measures of collective efficacy beliefs, asking questions that only pertain to the performance of a sport. To provide a more holistic view of collective efficacy beliefs, Petitta et al. (2015) created the scale for General Collective Efficacy beliefs (GCE) that included measures for confidence in the team ability to perform tasks (GCE-task), manage interpersonal relationships (GCE-relationships), and manage emotions (GCE-emotions). The study was conducted with athletes (n = 315) in 23 different sports. The mean age of the athletes was 24.32 (SD = 6.70), indicating that there were collegiate and older adult participants, although the researchers did not provide descriptive statistics for this aspect of their sample. The proposed GCE scale demonstrated internal reliability for each of the three subscales (α = .90–.95), and questions like "I believe my work group is always able to work effectively even when conflicts arise" and "I believe my work group is always able to share positive emotions" provide important insight into factors outside of task performance. However, the instrument still fails to address contextual factors that may influence collective beliefs in the different sociocultural contexts of various sports, which is important for any kind of intervention (Petitta, 2015, p. 199).

Overall, the GCE provides valuable information about how to measure the impact of non-task related factors on collective efficacy beliefs in sports. Although the GCE-relationships and GCE-emotions items could be applied to a college context (e.g., "work effectively when the climate is highly competitive" and "create the conditions so that everyone can express their emotions"), there are obstacles to using this instrument for a college soccer team. First is that the task-related questions are vague (e.g., "[our team can] coordinate itself in the best way to

overcome all obstacles"), which does not follow guidance from Bandura (2006) that efficacy belief scales should account for different levels of task difficulty. Second, the validity of the scale could be questioned based on the assertion by the researchers that each sport studied required a "fair amount" of interaction and interdependence (Petitta, 2015, p. 186). Although some interaction is inherent in all sports teams, the relationships and emotions present in a team of ice skaters may have different characteristics and be affected by different factors than in a college soccer team.

Although the CEQS, OCESS, and GCE do provide information about individual beliefs about team ability, all three lack predictive value based on the nuances of specific sports and therefore do not give practitioners a clear picture of how to influence those beliefs. It is not hard to imagine a team scoring poorly on the CEQS unity subscale, for instance, but still being able to perform well in sports where individual excellence can disproportionately influence team performance, like a pitcher in baseball who throws a no-hitter. Additionally, one could imagine a team that scores poorly on the GCE item "I believe my work group is always able to work effectively even when conflicts arise," but without contextual information that reveals why the conflict arose in the first place, practitioners may be unable to intervene (Petitta et al., 2015, p. 199). Despite not being best suited as predictive tools for college coaches in specific sports or specific performance environments, the three validated scales examined here could serve to confirm external validity for more precise sport-specific collective efficacy scales.

Conclusion

Sport is a unique domain of human activity, combining motor skill acquisition with individual and collective application of those skills. The influence of sources of self- and collective efficacy beliefs varies across different types of sports (i.e., individual and team),

different levels of competition (i.e., college and professional), and for different types of efficacy beliefs (i.e., process efficacy and performance efficacy). Efficacy information often comes to athletes and teams from the same sources as in other domains, but the interpretation of that information and its subsequent effect on self- and collective efficacy beliefs are unique.

This research is focused on NCAA Division I soccer teams, and the additional factors that can influence efficacy beliefs in a college setting. These factors are characterized here as academic, social, and structural. All three factors can change the relative influence of sources of collective efficacy beliefs like mastery experience, vicarious experience, verbal persuasion, physiological and affective states, group leadership, and group cohesion. Therefore, these three college factors must be part of any instrument that measures collective efficacy beliefs in collegiate populations.

The next chapter will describe a new approach to measuring collective efficacy beliefs in collegiate athletics. The proposed instruments will examine the strength of the proposed sources of collective efficacy beliefs in college soccer teams and explore questions about those beliefs that account for the unique academic, social, and structural factors present in a collegiate setting.

Chapter 3

This research study was guided by four research questions:

1. Which sources of collective efficacy beliefs are present in NCAA Division I soccer players?
2. How do academic, social, and structural factors that are unique to the collegiate sport environment help to describe the collective efficacy beliefs of NCAA Division I soccer players?
3. To what extent are collective efficacy beliefs predicted by their sources for NCAA Division I soccer players?
4. How do the athlete's year in school, coach tenure, and size of school moderate the relationship between collective efficacy beliefs and their sources for NCAA Division I soccer players?

The purpose of the study was to validate two scales, one that measures the Sources of Collective Efficacy Beliefs in NCAA Division I soccer players and another that measures Collective Efficacy Beliefs themselves. This research will provide college soccer coaches with comprehensive tools that suggest focused interventions to increase the collective efficacy beliefs of their teams.

Construction of Collective Efficacy Belief Scales

Efficacy beliefs are characterized as "adaptive cognitions" (Beauchamp et al., 2012, p. 279), suggesting that they help groups adapt to their environments in positive ways. For athletes,

stronger efficacy beliefs result in teams that change and grow to be more successful in volleyball, football, soccer, and myriad other sports. Although it is useful to know the strength of a team's collective efficacy beliefs, this research focuses on helping coaches to apply that understanding with specific interventions. An instrument designed to explore sources of collective efficacy beliefs and the beliefs themselves must therefore provide information that guides the design of those interventions for coaches and leaders.

Although self-efficacy beliefs are an important component of collective efficacy beliefs, measuring collective efficacy beliefs is not as simple as just aggregating group member's beliefs in their individual self-efficacy. This is because of the interaction that occurs between group members as they strive to accomplish team goals. Even in sports where individuals perform in isolation from the other members, such as gymnastics, there are still group dynamics that could affect collective efficacy beliefs. For this research on college soccer teams, a sport that features high levels of interdependence among team members, the most accurate measurement of collective efficacy belief will be an aggregation of individual beliefs in the group's ability to perform (Bandura, 2006). Relying on Bandura's (2006) guide to constructing self-efficacy scales suggests several steps that must be followed to ensure that collective efficacy belief scales provide us with the valid and predictive qualities necessary to be useful in the domain of interest.

Content Validity

First, collective efficacy belief scales must be domain specific. As Bandura (1997) asserted, "perceived collective efficacy is not a monolithic group attribute" (p. 479). This means group efficacy beliefs will vary with the area of endeavor (e.g., business, education, athletics), and instruments must reflect the differing social structures and environmental factors that affect work in each domain. For college soccer teams, measurement items will reflect the demands of

the sport, like the significant fatigue that can occur late in games and in overtime given the distance covered by most players in 90 minutes of play (or 110 minutes if a full overtime period is played).

Second, collective efficacy beliefs will vary with the difficulty of each new task a group confronts, so collective efficacy measures must account for that variance. As Bandura (1997) stated, "measures of personal efficacy must be tailored to domains of functioning and must represent gradations of task demands within those domains" (p. 42). For example, product design and proposal development are different tasks in the business environment. Furthermore, within product design, producing a prototype and refining the finished product are different levels of tasks. In soccer terms, task types may include adhering to a summer conditioning program and performing well in inclement weather. Task levels may include performing well as a team within the first two weeks of the season v. performing well as a team by the end of the season.

Finally, item construction in collective efficacy belief scales is critical. Scale items must be precise, so respondents are not required to "decode" the questions they are being asked before answering. As Bandura (2006) asserted, the danger is that efficacy belief scales suffer from the "indefiniteness of key terms", and therefore "provide relatively insensitive measures of perceived efficacy" (p. 45). For instance, asking a soccer player to assess their group's ability to "stay united throughout a season" may introduce hidden variance, as each member of the group may have a different concept of what being "united" looks like. A more useful question would ask an athlete about their confidence that their team can "continue to encourage each other after losing multiple consecutive games."

In addition to very precise questions, there is a place for broad questions that assess general beliefs about efficacy in groups. Indeed, Bandura (2006) stated that performance is partly

guided by "higher order regulatory skills…[including] generic skills for diagnosing task demands, constructing and evaluating alternative courses of action, setting proximal goals to guide one's efforts, and creating self-incentives to sustain engagement in taxing activities" (p. 308). These higher order skills should be measured using broad questions about regulatory ability that apply to multiple domains. The key for researchers in specific domains is to ask those broad questions in a way that applies specifically to the situation of interest. For instance, asking players about their belief in team ability to "execute a sport strategy" provides less applicable information to a coach than a question that asks about belief in team ability to "execute a strategy from the coach at the beginning of a soccer game."

Population and Sample

There are approximately 25,249 male and 28,375 female soccer players across NCAA Division I, II, and III (NCAA, 2020a). The sample for this research (n = 143) was drawn only from the population of 15,426 NCAA Division I soccer players in the United States (NCAA, 2020a). The sample was distributed among male (n = 74) and female (n = 69) participants. The researcher accessed this population by sending emails to a subset of the coaches of Division I soccer programs who participated in an efficacy belief pilot study in April 2020. Coaches were asked to forward the survey link to their Fall 2020 returning players and conduct two follow-up checks to encourage completion. The sample was drawn from both public and private institutions, of varying size, from multiple geographical regions and as such provided a representative sample of Division I collegiate soccer players. Any deviation from the assumed representativeness of the sample is addressed in the discussion section.

Delimitations

This research sample was limited to NCAA Division I athletes (excluding Division II and Division III) because of the differences inherent in the various divisions and the experience of the researcher at the Division I level of competition. Although it would be informative to include athletes from all divisions, the variation in academic, social, and structural factors when comparing Division I with Divisions II and III would limit the relevance of many scale items. For instance, initial eligibility requirements for Division I freshmen are higher than for Division II freshmen based on the NCAA sliding scale for GPA and SAT or ACT, which may limit the generalizability of findings related to academic factors, if lower GPA or standardized test scores are assumed to reflect a lower level of academic preparedness for college (NCAA, n.d-a.).

Additionally, Division I athletes are allowed more time to practice together in the non-championship (spring) season, which could influence development of group cohesion and the speed with which new student-athletes are integrated. Also, travel and operating budgets for Division I programs are often more robust than for Division II and Division III, creating a disparity in travel conditions (e.g., fewer players in a hotel room on road trips), and Division I programs often have more full-time staff members across the functions of coaching, strength and conditioning, and academic support. This is not to suggest that Division I programs are identical in all respects, but to recognize that there is more disparity between divisions than within divisions. Creating an instrument that is domain specific, as defined by Bandura (1997), suggests that any efficacy beliefs scale must account for such differences.

Instrumentation

This study employed a quantitative design, using a self-report questionnaire. The study had three phases: pilot study, instrument development, and data collection and analysis. The pilot

study (conducted in April 2020) established the initial reliability of a Collective Efficacy Beliefs scale for NCAA soccer players across Division I, II, and III. The instrument development phase of the current study proposes a revised Collective Efficacy Beliefs scale and introduces a Sources of Collective Efficacy Beliefs scale for NCAA Division I soccer players.

Pilot Study

The pilot study was conducted in April of 2020 to create an initial version of a Collective Efficacy Beliefs scale for NCAA soccer players. The items in the pilot questionnaire were based on a review of studies about collective efficacy beliefs and grounded in the theories of self- and collective efficacy beliefs as proposed by Bandura (1997). The items were created by a subject matter expert with 15 years of college soccer coaching experience at the Division I and II levels and reflected the specific domains of collegiate athletics and soccer. The pilot study was tested for readability and clarity with five NCAA Division I men's soccer players from the team coached by the researcher. This test led to no changes in the wording or format for items in the pilot instrument.

Following the confirmation of items, the pilot instrument was distributed to a purposeful convenience sample of NCAA soccer players (n = 145). Frequencies for individual variables are shown in Table 1; frequencies for institution variables are shown in Table 2.

Table 1

Frequencies for Pilot Study Individual Variables

Variable	Level	Frequency	%
Gender	Male	117	80.7%
	Female	28	19.3%
	Total	145	100.0%
Year in School	RS FR	12	8.3%
	Sophomore	52	35.9%
	Junior	46	31.7%
	Senior	35	24.1%
	Total	145	100.0%

Note. NCAA is the acronym for the National Collegiate Athletic Association. RS FR is a designation meaning "redshirt freshman" that signifies the athlete is in their second year of participation but has not participated in the requisite number of competitions to have used a year of NCAA eligibility, usually set at 20% of the total allowable contests in the championship (fall) segment.

Table 2

Frequencies for Pilot Study Institution Variables

Variable	Level	Frequency	%
NCAA Division	I	82	56.6%
	II	8	5.5%
	III	55	37.9%
	Total	145	100.0%
Miles From Home	< 100	43	29.7%
	101–200	34	23.4%
	> 200	68	46.9%
	Total	145	100.0%
Enrollment	< 2,000	21	14.5%
	2,001–10,000	84	57.9%
	> 10,000	40	27.6%
	Total	145	100.0%

Note. NCAA is the acronym for the National Collegiate Athletic Association. There are differences in the rules and regulations between the three NCAA Divisions which affect the intercollegiate athletic experience for individuals and teams. These rules are published by the NCAA in the yearly Rules Manuals for each division.

Participants in the pilot study responded to 28 questionnaire items about their confidence that their soccer teams could perform sport-related tasks. The stem for each question was "Please rate how CONFIDENT you are that working together, your team CAN DO each of the things described below by selecting the appropriate number." Collective Efficacy Beliefs responses were measured on a 6-point Likert scale from 1 (*Completely UNconfident*) to 6 (*Completely*

confident). The data were analyzed using a principal components analysis (PCA) with a Varimax rotation. Cronbach's alpha for the Collective Efficacy Beliefs scale was □ = .93. A Shapiro-Wilk test of the collective efficacy beliefs mean score showed a significant departure from normality, $W(145) = .98$, $p = .034$.

Although the Collective Efficacy Beliefs instrument used in the pilot study has since been modified to fit updated research questions, the non-normality of scores on the Collective Efficacy Beliefs scale is important to recognize. This result could be caused by the demographic variable of level of competition (i.e., NCAA Division I, II, and III) in the sample, as there were more Division I soccer players ($n = 82$) than Division II ($n = 8$) and Division III ($n = 55$). According to Bandura (1997) individuals with high levels of self-efficacy belief will usually choose the most challenging activities and are motivated through cognitive processes to set higher standards of achievement. This theory can be extended to the efficacy beliefs of teams as well. NCAA Division I athletes compete at the highest level of amateur sport in the United States, so it is not surprising that a sample that is composed of more than 50% Division I athletes would reflect high levels of collective efficacy belief.

Sources of Collective Efficacy Beliefs Scale

The Sources of Collective Efficacy Beliefs scale for this study consisted of 19 items and was based on the four sources of self- and collective efficacy beliefs identified by Bandura (1997). There are items that address mastery experiences (ME; three items), vicarious experiences (VI; three items), verbal persuasion (VP; three items), and physiological and affective states (PH; three items). Additionally, the literature review suggested the addition of items that assess emergent sources of collective efficacy beliefs like group leadership (LD; four items) and group cohesion (CO; three items). Examples of these emergent items are "My

coaches and team leaders made everyone on the team feel like they belonged" (LD3) and "My team liked each other and got along well on and off the field" (CO2). Participants were asked to rate how False or True each statement was based on their last full season (Fall 2019) on a 6-point Likert scale ranging from 1 (*Completely False*) to 6 (*Completely True*). Items for all six proposed factors were crafted to address the multiple types and levels present in each source of collective efficacy beliefs. The full Sources of Collective Efficacy Beliefs questionnaire can be found in Appendix A.

Collective Efficacy Beliefs Scale

The PCA performed on the Collective Efficacy Beliefs instrument during the pilot study resulted in a six-factor solution after rotation. Analysis of items that did not load clearly onto one of the factors, or that cross-loaded on multiple factors led to the removal of three items and the modification of an additional item. Items that referred to the nontraditional (spring) segment of the season were removed or modified because of the variation in athletic structure and opportunities offered by different institutions. An example of this type of question was Item 11, asking respondents to rate their confidence that their team could "Play well as a team during the spring season and during spring game(s)." This variation could be due to differences in allowable activities between different divisions, or differences in how programs organize their spring, which can be tied to academic calendars (i.e., semesters v. quarters). For instance, although Division III schools are only allowed 15 days of practice and one match in the spring, Division I schools can train for the entire semester and play five matches.

The updated Collective Efficacy Beliefs instrument for the current study consisted of 21 items. Construction of the Collective Efficacy Beliefs scale drew on items from the pilot study that reflected academic, social, and structural factors present in collegiate sports to address

Research Question 2. This was done to ensure the accuracy of the overall instrument, by including aspects of college soccer beyond the tasks that athletes perform on the soccer field (soccer task items are labeled general efficacy [GE] factors for this study). Examples of questions addressing these non-soccer-task factors are "Please indicate how CONFIDENT you are *right now* in your TEAM's ability to perform well as a team in games during a week with one or more midterm examinations" (academic); "Please indicate how CONFIDENT you are *right now* in your TEAM's ability to collectively make decisions about nutrition, hydration, and sleep that support strong team performance when you are with non-athlete friends, or when parties and other social gatherings are happening" (social); and "Please indicate how CONFIDENT you are *right now* in your TEAM's ability to collectively recover from the previous game and perform well as a team with THREE days or less in between games" (structural). Participants were asked to rate their confidence on a 6-point Likert scale ranging from 1 (*Completely UNconfident*) to 6 (*Completely confident*). The full Collective Efficacy Beliefs questionnaire can be found in Appendix B.

Outcome Expectancies Scale

To test the external validity of the Sources of Collective Efficacy Beliefs scale and the Collective Efficacy Beliefs scale, I created the Outcome Expectancies Scale. The outcome expectancies scale consists of four questions that assess participant expectations that their team will achieve desired outcomes. An example of an outcome expectancies item asks participants to rate the accuracy of the statement: "I expect our team will win the next game." Participants responded on a 6-point Likert scale ranging from 1 (*Completely INaccurate*) to 6 (*Completely accurate*). Outcome expectancies are causally related to the performances that precede them but are distinct from the performances themselves and the efficacy beliefs that underlie those

performances (Bandura, 1997). Thus, an indicator of desired team performance in soccer may be having more possession than the opponent, and the desired outcome achieved may be winning the game. The collective efficacy beliefs that underlie the performance (i.e., confidence in the team's ability to possess the ball) are distinct from the outcomes that may arise from having more possession (i.e., winning the game). The full Outcome Expectancies Scale questionnaire can be found in Appendix C.

Data Collection

The questionnaires were made available through Qualtrics to a purposeful sample of NCAA Division I soccer players. Participants were asked to complete demographic and background factor questions, the Sources of Collective Efficacy Beliefs questionnaire, the Collective Efficacy Beliefs questionnaire, and the Outcome Expectancies questionnaire in a single sitting.

Timeline for Data Collection

Questionnaires were first made available on October 1, 2020, and closed on October 15, 2020. Because only 80 responses were received in this first data collection period, the questionnaire was then sent to all NCAA Division I men's and women's soccer coaches through the national United Soccer Coaches email listserv. This second data collection window extended through October 31, 2020, and yielded 63 additional complete responses.

Survey Distribution Methods

Surveys were distributed by email through the online service Qualtrics. Survey emails were sent to 14 NCAA Division I coaches I knew who forwarded the survey to their Fall 2020 returning players (i.e., sophomores, juniors, and seniors). There were seven women's teams and seven men's teams represented in this first data collection period. Of these 14 coaches, eight

were head coaches and six were assistant coaches. The emails emphasized the importance of only including players who had been on the respective rosters for the Fall 2019 soccer season. During the first data collection period; all selected coaches received a $100 gift card of their choice for their participation. I followed up by email with each coach two additional times during the 2-week collection period to encourage participation. During the second data collection period, no incentives were offered to coaches and no follow-up communication was initiated after the initial email. This was due to the request being sent to all Division I coach in the country (approximately 600 total), most of whom I had no prior relationship with.

Data Analysis

The first step in data analysis was to obtain descriptive statistics through IBM SPSS Statistics (Version 27) for the sources of collective efficacy beliefs and the collective efficacy beliefs results, including means and standard deviations for each factor. Second, Pearson correlations were obtained within instruments and between instruments. Third, Shapiro-Wilk tests were conducted on the means for both questionnaires to analyze normality of results, and scatterplot analyses were performed to reveal any outliers or violations of homoscedasticity. Finally, the external validity of the Sources of Collective Efficacy Beliefs and Collective Efficacy Beliefs questionnaires was tested by performing a correlation analysis with the Outcome Expectancies Scale. As previously noted, it was expected that the Outcome Expectancies Scale would show a significant positive correlation with the Sources of Collective Efficacy beliefs and Collective Efficacy Beliefs scales of at least $r = .40$, but no more than $r = .60$, indicating independence of both scales from the Outcome Expectancies Scale. This acceptable range was based on the correlation results from the pilot study, where a correlation ($r = .60$) was calculated between the similar constructs of self-efficacy beliefs and sources of self-

efficacy beliefs, and a correlation (r = .43) was found between self-efficacy beliefs and collective efficacy beliefs.

Research Question 1

To examine which sources of collective efficacy beliefs are present in NCAA Division I soccer teams, an exploratory factor analysis (EFA) was performed on the item responses for the Sources of Collective Efficacy Beliefs scale. An EFA is a type of factor analysis used to reveal underlying attributes that may not be apparent from measured items, as with those on a survey (Tucker & MacCallum, 1997). The research hypothesis was that there would be a six-factor solution consisting of the latent factors mastery experiences (ME), vicarious experiences (VI), verbal persuasion (VP), physiological and affective states (PH), group cohesion (CO), and group leadership (LD). This hypothesized model is shown in Figure 1. The first four factors (mastery experiences, vicarious experiences, verbal persuasion, physiological and affective states) are supported as sources of collective efficacy beliefs based on extension of self-efficacy theory (Bandura, 1997). An EFA was necessary because the fifth and sixth factors, group leadership and group cohesion, have not been previously modeled as sources of collective efficacy beliefs, although there is evidence for their inclusion as sources based on multiple previously referenced studies (e.g., Filho et al., 2015; Watson et al., 2001).

The EFA extraction method was PCA with a Varimax rotation. Model fit was assessed through multiple measures. First, only factors with Eigenvalues $\lambda > 1$ were retained in the model (Kaiser, 1960). Second, a Kaiser-Meyer-Olkin (KMO) measure > .5 and a significant Bartlett's sphericity test was used to confirm that the data could be factored (Dziuban & Shirkey, 1974). Third, extraction communalities for survey variables were analyzed for values < .5, which may have indicated that item variance was not absorbed well enough into the common variance, and

the desired threshold for total variance explained by extracted factors was set at 70% (Watkins, 2018). Factor loadings from the PCA rotated component matrix were examined to ensure that each factor had contributions from at least two input variables, and that there was a loading > .35 for the variables retained in each factor (Watkins, 2018). Instances of cross loading where items loaded on multiple factors above the designated threshold were analyzed for problems with wording or relevance and modified or removed based on theoretical considerations.

The measurement model used to further refine the PCA model was a confirmatory factor analysis (CFA). The CFA was run through IBM SPSS AMOS (Version 27). Model fit was assessed through multiple measures. First, a significant Chi-squared measure ($p < .01$) indicated overall goodness of fit for the model. Second, a root mean square error of the approximation (RMSEA) value < .1 (Browne & Cudeck, 1993), a comparative fit index (CFI) > .9 (Albright & Park, 2009), and a minimum discrepancy over degrees of freedom (CMIN/*df*) < 2 were analyzed as further evidence of model fit. Where analysis of these combined measures suggested a poor model fit, further examination was conducted to identify outliers with a Mahalanobis distance discrepancy > 100 (Kline, 2011) and non-normality of variables indicated by a univariate kurtosis > 7 (West et al., 1995) or multivariate kurtosis > 5 (Bentler, 2006). In cases where acceptable RMSEA, CFI, and CMIN/*df* values were still not obtained after adjusting for outliers and non-normality, modification indices (MI) were analyzed for values > 10, which could indicate potential model misspecification (Kline, 2011) and changes were made to the model as appropriate. Based on suggested changes to items or factors, an additional CFA was run and a comparison between respective Chi-squared values and other measures was used to determine which model provided the best fit for the data. Following model fit analysis, a reliability analysis was conducted on the sources of collective efficacy beliefs results in IBM SPSS Statistics

(Version 27) to obtain Cronbach's alpha measures for the full scale and identified subscales based on retained items.

Research Question 2

To determine how academic, social, and structural factors help to describe the collective efficacy beliefs of NCAA Division I soccer teams, an EFA was performed on the Collective Efficacy Beliefs scale. The research hypothesis was that there would be a four-factor solution consisting of the latent factors GE, academic factors (AC), social factors (SO), and structural factors (ST). Items in the general efficacy factor were supported by multiple research findings on the importance of team task performance for team efficacy beliefs (Feltz & Lirgg, 1998; Short, Sullivan, & Feltz, 2005). The academic, social, and structural factors were supported by evidence of the unique stressors experienced by collegiate athletes (Huml et al., 2019) and the 14 years of experience I have playing and coaching soccer at the NCAA Division I level.

The EFA extraction method was PCA with a Varimax rotation. Model fit was assessed through multiple measures. First, only factors with Eigenvalues $\lambda > 1$ were retained in the model (Kaiser, 1960). Second, a KMO measure > .5 and a significant Bartlett's sphericity test was used to confirm that the data could be factored (Dziuban & Sharkey, 1974). Third, extraction communalities for survey variables were analyzed for values < .5, which may have indicated that item variance was not absorbed well enough into the common variance, and the threshold for total variance explained by extracted factors was set at 70% (Watkins, 2018). Factor loadings from the rotated component matrix were examined to ensure that each factor has contributions from at least two input variables, and that there was a loading > .35 for the variables associated with each factor (Watkins, 2018). Instances of cross loading where items loaded on multiple

factors above the designated threshold were analyzed for problems with wording or relevance and modified or removed based on theoretical considerations.

The measurement model used to further refine the PCA model was a CFA. The CFA was run through IBM SPSS AMOS (Version 27). Model fit was assessed through multiple measures. First, a significant Chi-squared measure ($p < .01$) indicated overall goodness of fit for the model. Second, an RMSEA value < .1 (Browne & Cudeck, 1993), a comparative fit index (CFI) > .9 (Albright & Park, 2009), and a minimum discrepancy over degrees of freedom (CMIN/*df*) < 2 were analyzed as further evidence of model fit. Where analysis of these combined measures suggested a poor model fit, further examination was conducted to identify outliers with a Mahalanobis distance discrepancy > 100 (Kline, 2011) and non-normality of variables indicated by a univariate kurtosis > 7 (West et al., 1995) or multivariate kurtosis > 5 (Bentler, 2006). In cases where acceptable RMSEA, CFI, and CMIN/*df* values were still not obtained after adjusting for outliers and non-normality, modification indices (MI) were analyzed for values > 10, which indicate potential model misspecification (Kline, 2011). Based on suggested changes to items or factors, a new CFA was run and a comparison between respective Chi-squared values and other measures was used to determine which model provided the best fit for the data. Following model fit analysis, a reliability analysis was conducted on the collective efficacy beliefs results in IBM SPSS Statistics (Version 27) to obtain a Cronbach's alpha measure for the full scale and subscales based on retained items.

Research Question 3

Research Question 3 explored the extent to which collective efficacy beliefs could be predicted by the identified sources through a multiple linear regression using IBM SPSS Statistics (Version 27). The independent variables were the measured subscale scores for each of

the latent factors from the Sources of Collective Efficacy Beliefs scale and the dependent variable was the measured total Collective Efficacy Beliefs score. The results of the regression analysis were an R^2 statistic for each independent variable, showing the amount of variance in collective efficacy beliefs explained by each proposed source of collective efficacy beliefs.

The normality of the error variable was tested using a histogram and P-P plots of standardized residuals with Collective Efficacy Beliefs as the dependent variable. Error variance was tested by plotting the regression standardized predicted value versus regression studentized deleted residual, with collective efficacy beliefs as the dependent variable. Independence of errors was tested using the Durbin-Watson statistic differential (Savin & White, 1977). Outliers among sources of collective efficacy beliefs responses were examined through computation of a leverage statistic $h > .5$ or Cook's distance $D > 1$. Acceptable multicollinearity was tested by requiring a tolerance value < 20 and variance-inflation factor (VIF) > 5.

Research Question 4

Finally, a moderation analysis of three background factors was conducted through multiple linear regression in IBM SPSS Statistics (Version 27). The independent variables were latent variables from the Sources of Collective Efficacy Beliefs scale and the dependent variable was the total Collective Efficacy Beliefs score. The background factors were athlete's year in school, head coach tenure, and size of institution. The independent and dependent variables were continuous, while the background factors all had three levels.

Year in school levels were 1 (*second year in the soccer program*), 2 (*third year in the soccer program*), and 3 (*fourth year or more in the soccer program*). Year in school levels excluded athletes in their first year because in October 2020 they had only been a part of their respective teams for 2–3 months, and COVID–19 constraints in most NCAA institutions limited

(or eliminated) individual opportunities to assess team abilities in a competitive game scenario, as most teams were limited to practicing and playing exhibitions. It is important to note that first year athletes were included in the pilot study in April 2020 due to their participation in the previous (Fall 2019) season with their teams.

Coaching tenure levels were 1 (*1–3 years*), 2 (*4–7 years*), and 3 (*8 years or more*). Designation of coaching tenure levels was based on researcher experience as a soccer coach and discussions with Division I head coaches about their philosophy at various points of their careers. Additionally, upon reaching four years in a program a head coach has likely been involved in the recruiting of every current athlete and is no longer coaching athletes that they inherited from the previous coach.

Size of school levels were 1 (*less than 2,000*), 2 (*between 2,000 and 10,000*), and 3 (*more than 10,000*). Designation of size of school levels was again based on researcher experience with coaching soccer at institutions of various sizes and interaction with student-athletes and coaches at those institutions.

To test the moderating effect of the background factors on the relationship between collective efficacy beliefs and their sources, interaction variables were created by multiplying the mean-centered latent variables with the appropriate background factors. Mean-centering was required to mitigate collinearity between background factors and interaction variables (Iacobucci et al., 2016). Collective efficacy beliefs were then regressed onto the latent variables first with just the categorical background factors in the model, and then again with mean-centered interaction variables included. These regression results were analyzed for significant effects of the interaction variables and overall significant R^2 changes in the models.

Ethical Considerations

I am CITI certified, and IRB approval for this study was obtained in March 2020, expiring in April 2022. Participants were required to sign an informed consent letter before taking the survey. Participants had the option to end the survey at any time with no penalty. No identifying personal information was recorded, and survey responses were only accessible to me. Each survey link was individualized to the participant, so no other individuals could access the responses. The link to the survey became inactive and inaccessible to each participant immediately after completion. The informed consent document is in Appendix D.

Summary

This study presents a methodology for studying how NCAA Division I soccer players develop collective efficacy beliefs, and how those beliefs are influenced by factors and variables unique to their sport and the college environment. Given the established relationship between collective efficacy beliefs and team performance, it is crucial that coaches have a tool that measures collective efficacy beliefs in the complex and dynamic context of collegiate athletics.

A review of the literature indicated that although college soccer coaches have multiple methods available to measure individual athlete qualities and statistics to measure team performance, there is no instrument that helps them characterize the influence of the NCAA college environment on the collective efficacy beliefs of their teams.

The methodology for this study includes instruments to measure collective efficacy beliefs and their sources. Both measures were designed to account for the unique nature of sports in the college environment and the unique experience of student-athletes in that environment. Collection and analysis of this data could lead to a more specific and practical understanding of

collective efficacy beliefs for college soccer coaches and suggest specific methods for coaches to improve those beliefs and subsequent performances.

Chapter 4

As mentioned previously, this study was guided by four research questions:

1. Which sources of collective efficacy beliefs are present in NCAA Division I soccer players?
2. How do academic, social, and structural factors that are unique to the collegiate sport environment help to describe the collective efficacy beliefs of NCAA Division I soccer players?
3. To what extent are collective efficacy beliefs predicted by their sources for NCAA Division I soccer players?
4. How do the athlete's year in school, coach tenure, and size of school moderate the relationship between collective efficacy beliefs and their sources for NCAA Division I soccer players?

This chapter reports the results of the tests performed to answer these four questions.

Instrumentation

This study employed a quantitative design, using a self-report questionnaire. The instrument was tested for readability and clarity by sending to five athletes who play for me on an NCAA Division I men's soccer team. The questionnaire was then distributed to a purposeful convenience sample of NCAA soccer players through emails to 14 coaches I know. Including my college soccer team and based on an estimated roster size of 20 players excluding Fall 2020 incoming freshmen and transfers, the initial data collection pool was estimated at 300 players. In

the second data collection period, 538 coaches were contacted (333 women's teams and 205 men's teams). The total potential sample for this collection period was estimated at 1,780 players.

At the end of the second data collection period, 213 total responses were recorded. Of these 213 responses, 67 did not meet the 80% completeness threshold that would have allowed the use of missing data replacement techniques. Of the remaining 146 surveys, three were incomplete (missing at least one item response) and excluded from analysis based on their minimal impact on statistical power. All 143 surveys that were 100% complete were retained for analysis. Table 3 shows respondent demographics by gender and type of academic term at their respective institutions.

Table 3

Frequencies of Demographic Variables

Variable	Level	Frequency	%
Gender	Male	74	51.7%
	Female	69	48.3%
	Total	143	100.0%
Term Type	Semester	12	86.7%
	Quarter	52	13.3%
	Total	143	100.0%

Research Question 1

Sources of Collective Efficacy Beliefs EFA

To examine which sources of collective efficacy beliefs are present in NCAA Division I soccer teams, an EFA was performed on the item responses from the Sources of Collective Efficacy Beliefs scale. The factor analysis was performed using the PCA method of extraction. Bartlett's test of sphericity, which tests the overall significance of all the correlations within the correlation matrix, was significant at $\chi^2(171) = 1049.4$, $p < 0.001$, indicating that it was appropriate to use the factor analytic model on this set of data. The KMO measure of sampling adequacy indicated that the strength of the relationships among variables was high (KMO = .85), thus it was acceptable to proceed with the analysis. Initially, five factors with Eigenvalues greater than 1 were extruded. A Varimax rotation was performed because factors were assumed to be uncorrelated, and the obtained pattern matrix is displayed in Table 4. Only items with factor loadings > .35 are shown.

The five identified factors accounted for a total of 62.81% of the variance in Sources of Collective Efficacy Beliefs scores. The first factor had an Eigenvalue of 4.01 and it accounted for 21.11% of the variance in the data. Factor 2 had an Eigenvalue of 3.92 and accounted for a further 20.63% of the variance. The Eigenvalues for Factors 3, 4, and 5 were 1.39, 1.38, and 1.23 respectively, together accounting for a further 21.07% of the total variance.

There was problematic cross loading onto multiple factors in the cases of items ME2, PH2, and VP3R. For ME2 and PH2, the decision was made to retain both in Factor 1 for theoretical reasons. Scale item ME2 (my team performed well in practice the day before a game) seemed more congruent with other Mastery Experience items than with the Leadership, Vicarious Experience, and Verbal Persuasion items that comprised Factor 2. VC3R was initially retained in Factor 1 due to high factor loading (-.745) but further analysis revealed that removal of this item was beneficial, as it increased the Cronbach's alpha for the positive preparation

subscale from a low value of α = .560 to an acceptable value of α = .798 (Nunnally, 1978). The decision was made to remove CO3R and LD4R from the analysis based on their inability to group with at least one other item in their respective factors. PH3R and VP3R were retained in a third factor due to strong factor loading and the interpretability of the factor.

Table 4

Sources of Collective Efficacy Beliefs EFA Rotated Factor Loading Matrix

Scale Item	Factor 1	Factor 2	Factor 3
CO1	.599		
ME1	.856		
ME2	.445		
ME3	.519		
PH1	.762		
PH2	.586		
VC3R	-.745		
CO2		.642	
LD1		.807	
LD2		.660	
LD3		.828	
VC1		.559	
VC2		.483	
VP1		.470	
VP2		.472	
PH3R			.729
VP3R			.545

Note. CO is the abbreviation for the group cohesion subscale. ME is the abbreviation for the mastery experience subscale. PH is the abbreviation for the physiological and affective states

subscale. VC is the abbreviation for the vicarious experience subscale. LD is the abbreviation for the leadership subscale. VP is the abbreviation for the verbal persuasion subscale.

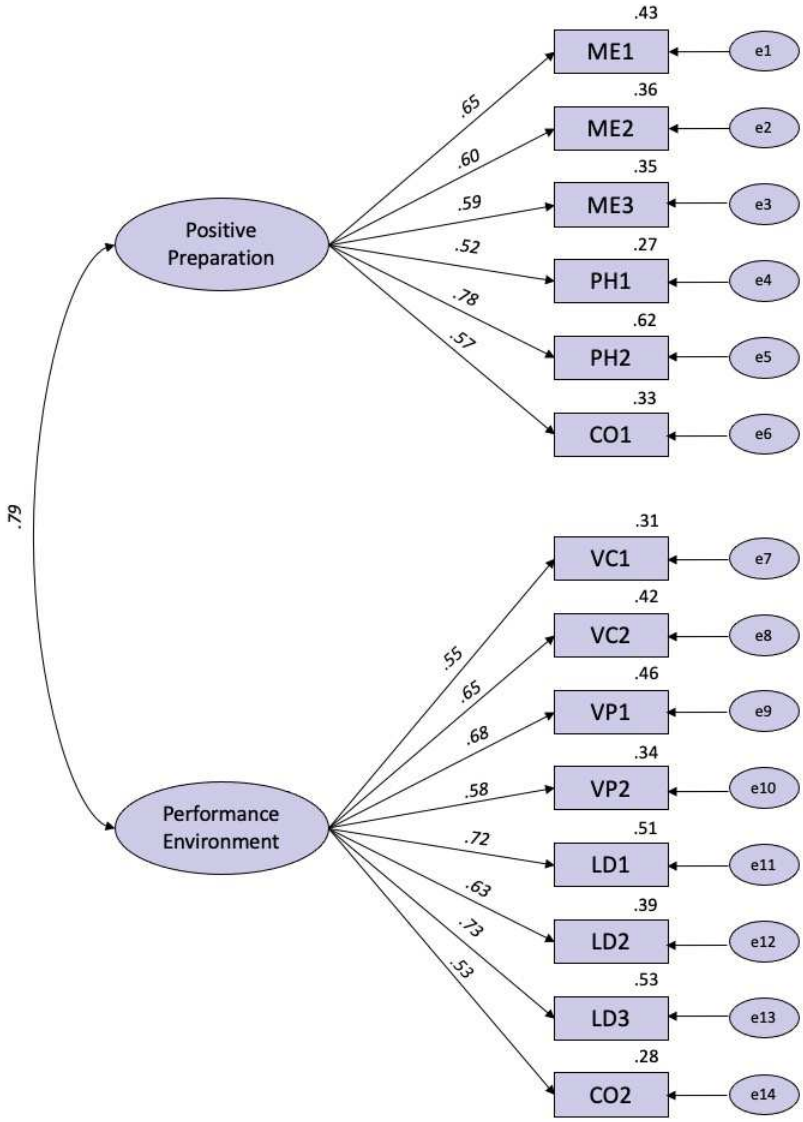
Factor 1 consisted of six items across the subscales Group Cohesion, Mastery Experience, and Physiological and Affective States. This factor was labeled *positive preparation* and demonstrated acceptable internal consistency (= .798; Nunnally, 1978). Factor 2 consisted of eight items across Group Cohesion, Leadership, Vicarious Experience, and Verbal Persuasion. This factor was labeled *performance environment* and demonstrated acceptable internal consistency (= .836). Factor 3 consisted of two items from Physiological and Affective States and Verbal Persuasion. This factor was labeled *negative reinforcement* and demonstrated low internal consistency (= .299). These three factors were considered subscales of a Sources of Collective Efficacy Beliefs scale for further analyses.

Sources of Collective Efficacy Beliefs CFA

The measurement model used to further refine the Sources of Collective Efficacy Beliefs model was a CFA. The CFA was performed through IBM SPSS AMOS (Version 27). Model fit was assessed through multiple measures. The best fitting model is shown in Figure 1.

Figure 1

Sources of Collective Efficacy Beliefs CFA Output Model



Note. CFA is the acronym for confirmatory factor analysis.

Through multiple iterations of CFA modeling, the negative reinforcement factor (PH3R and VP3R) was removed based on individual underperformance of both items in the model (i.e., standardized loading < .4 and squared multiple correlation < .2; Keith, 2019). Correlation

between Factor 1 and Factor 2 was suggested by analysis of the modification indices and enhanced the model fit. There were no problematic outliers (distance > 10) based on review of Mahalanobis distances. Multivariate kurtosis was above the desired threshold of 7 (*c.r.* = 15.03). The final model was an acceptable fit for the data, with $X^2 = 209.3$, CMIN/*df* = 2.68, CFI = .821, and RMSEA = .109.

Research Question 2

Collective Efficacy Beliefs EFA

To examine the presence of collective efficacy beliefs in NCAA Division I soccer teams, an EFA was performed on the item responses for the Collective Efficacy Beliefs scale. A factor analysis of the current results was performed using the PCA method of extraction. Bartlett's test of sphericity, which tests the overall significance of all the correlations within the correlation matrix, was significant at $\chi^2(210) = 1177.7$, $p < 0.001$, indicating that it was appropriate to use the factor analytic model on this set of data. The KMO measure of sampling adequacy indicated that the strength of the relationships among variables was high (KMO = .87), thus it was acceptable to proceed with the analysis. Initially, six factors with eigenvalues greater than one were extruded. A Varimax rotation was performed because factors were assumed to be uncorrelated, and the obtained pattern matrix is displayed in Table 5. Only items with factor loadings > .35 are shown.

The six identified factors accounted for a total of 63.19% of the variance in Collective Efficacy Beliefs scores. The first factor had an eigenvalue of 3.16 and it accounted for 15.06% of the variance in the data. Factor two had an eigenvalue of 2.81 and accounted for a further 13.36% of the variance. Factor three had an eigenvalue of 2.14 and accounted for a further

10.17% of the variance. The eigenvalues for factors four, five, and six were 1.87, 1.77, and 1.71 respectively, together accounting for a further 24.60% of the total variance.

Table 5

Collective Efficacy Beliefs EFA Rotated Factor Loading Matrix

Scale Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
GE5	.690					
GE7	.598					
GE8	.801					
ST2	.479					
ST4	.751					
AC3		.509				
AC4		.669				
GE3		.652				
SO1		.493				
SO4		.722				
ST3		.509				
GE1			.773			
GE2			.812			
GE6			.523			
GE4				.536		
SO2				.815		
ST1				.558		
AC1					.844	
AC2					.844	
AC5						.743
SO3						.771

Note. EFA is the acronym for exploratory factor analysis. GE is the abbreviation for general efficacy factors. ST is the abbreviation for structural factors. AC is the abbreviation for academic factors. SO is the abbreviation for social factors.

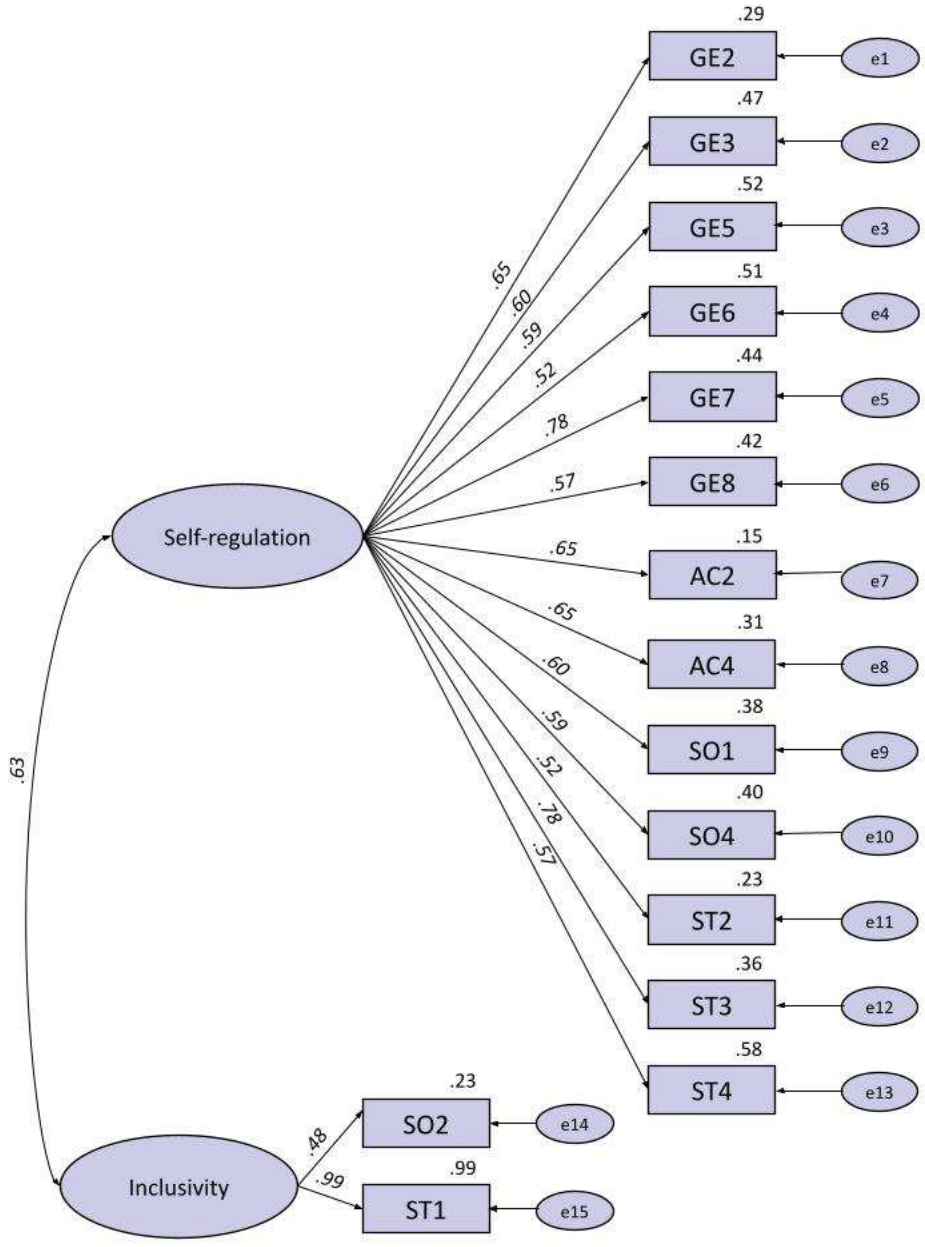
Factor 1 consisted of five items across General and Structural subscales. This factor was labeled *adaptability and perseverance* and demonstrated acceptable internal consistency (= .814; Nunnally, 1978). Factor 2 consisted of eight items across Academic, General, Social, and Structural subscales. This factor was labeled *academic and athletic balance* and demonstrated acceptable internal consistency (= .797). Factor 3 consisted of three items from the General subscale. This factor was labeled *autonomy* and demonstrated acceptable internal consistency (= .729). Factor 4 consisted of three items from the General, Social, and Structural subscales. This factor was labeled *competing* and demonstrated low internal consistency (= .661). Factor 5 consisted of two items from the Academic subscale. This factor was labeled *academic commitment* and demonstrated acceptable internal consistency (= .767). Factor 6 consisted of two items from the Academic and Social subscales. This factor was labeled *campus community* and demonstrated marginal internal consistency (= .543). These six factors were considered subscales of a Collective Efficacy Beliefs Scale for further analyses.

Collective Efficacy Beliefs CFA

The measurement model used to further refine the Collective Efficacy Beliefs model was a CFA. The CFA was performed through IBM SPSS AMOS (Version 27). Model fit was assessed through multiple measures. The best fitting model is shown in Figure 2.

Figure 2

Collective Efficacy Beliefs CFA Output Model



Note. CFA is the acronym for confirmatory factor analysis.

Through multiple iterations of CFA modeling, decisions were made to remove GE1, GE4, AC1, AC3, AC5, SO3 based on underperformance in the model (i.e., standardized loading

< .4 and squared multiple correlation < .2; Keith, 2019). Removal of these items and their associated factors revealed a two-factor model. Correlation between Factor 1 and Factor 2 was suggested by analysis of the modification indices and resulted in enhanced model fit. There were no problematic outliers (distance > 10) based on review of Mahalanobis distances. Multivariate kurtosis was above the desired threshold of 7 (*c.r.* = 10.73). The final model was an acceptable fit for the data, with χ^2 = 175.2, CMIN/*df* = 1.93, CFI = .892, and RMSEA = .081. Further review by the researcher of the items comprising the two factors led to the designation of Factor 1 as *self-regulation* and Factor 2 as *inclusivity*.

Scale Reliability and Correlations

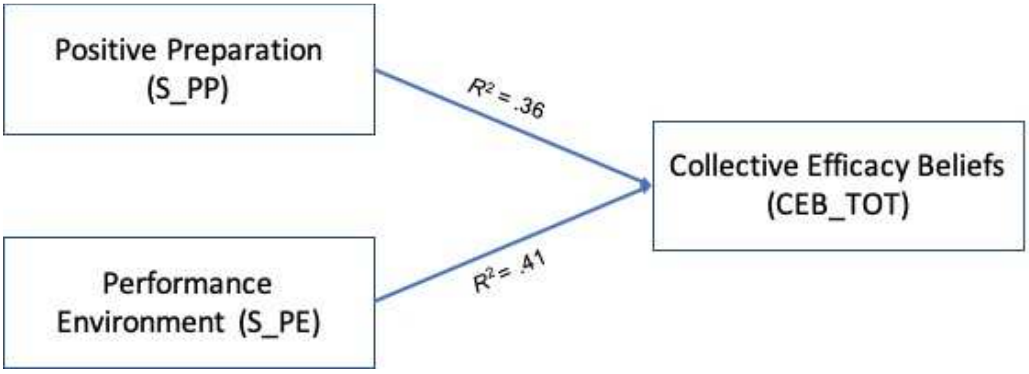
After performing EFA and CFA on the Sources of Collective Efficacy Beliefs and Collective Efficacy Beliefs scales and removing items based on failure to meet designated criteria, internal reliability was acceptable for the 14-item Sources of Collective Efficacy Beliefs scale (α = .88) and the 15-item Collective Efficacy Beliefs scale (α = .89). Internal reliability for the 4-item Outcome Expectancies Scale was also acceptable (α = .73). External validity of the Sources of Collective Efficacy Beliefs scale and Collective Efficacy Beliefs scale was analyzed through Pearson correlations with the Outcome Expectancies Scale, a related but distinct scale that measured beliefs about desired outcomes. An example of an Outcome Expectancies Scale item is asking respondents to indicate the accuracy of the statement "I believe that we will win our next game". Correlation between the proposed Sources of Collective Efficacy Beliefs scale and Outcome Expectancies Scale was higher than expected (*r* = .72). Correlation between the proposed Collective Efficacy Beliefs scale and the Outcome Expectancies Scale was within acceptable range defined through the pilot study (*r* = .54).

Research Question 3

The extent to which each source of collective efficacy beliefs predicted the collective efficacy beliefs themselves was analyzed through a multiple linear regression using IBM SPSS Statistics (Version 27). The path model for the regression analysis, based on the identified two-factor solution for Sources of Collective Efficacy Beliefs from Research Question 2, is shown in Figure 3.

Figure 3

Path Model for Regression Analysis of Collective Efficacy Beliefs



When Collective Efficacy Belief scores were regressed individually onto each factor, positive preparation significantly predicted Collective Efficacy Belief scores, $b = 7.08$, $t(143) = 8.92$, $p < .001$ and explained a significant proportion of variance in Collective Efficacy Belief scores, $R^2 = .36$, $F(1, 143) = 79.55$, $p < .001$. performance environment significantly predicted Collective Efficacy Belief scores, $b = 8.14$, $t(143) = 7.46$, $p < .001$ and explained a significant proportion of variance in Collective Efficacy Belief scores, $R^2 = .41$, $F(1, 143) = 98.1$, $p < .001$.

The histogram of standardized residuals indicated that the data contained approximately normally distributed errors (Figure 4 and Figure 5), as did the normal P-P plot of standardized residuals (Figure 6 and Figure 7).

Figure 4

Positive Preparation Histogram

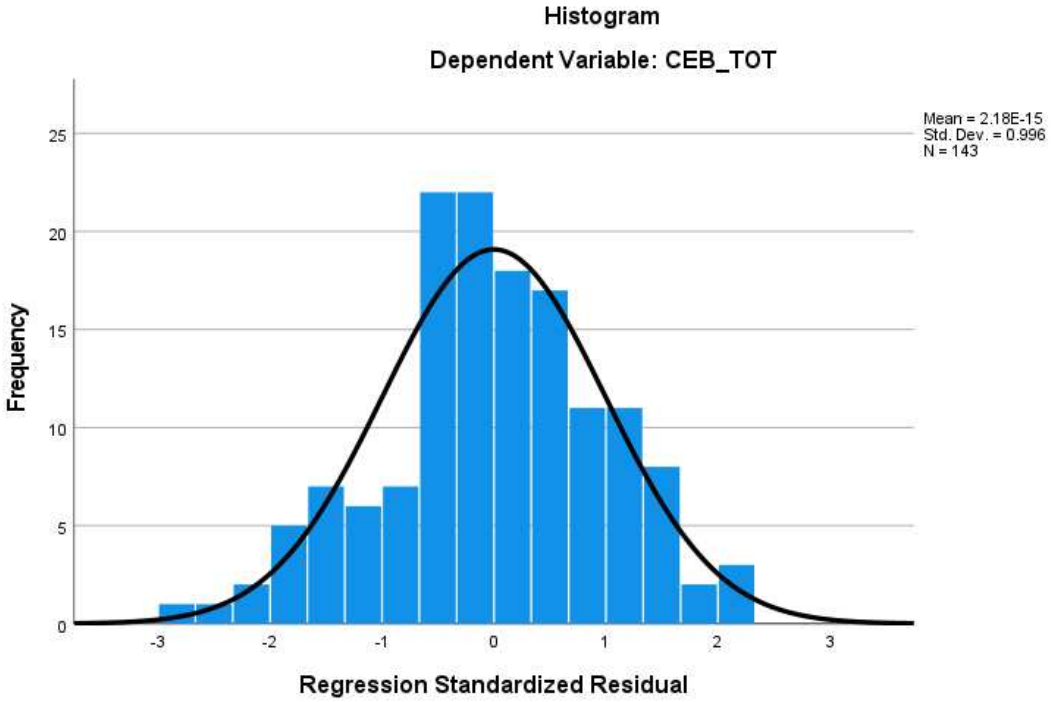


Figure 5

Positive Preparation P-P Plot

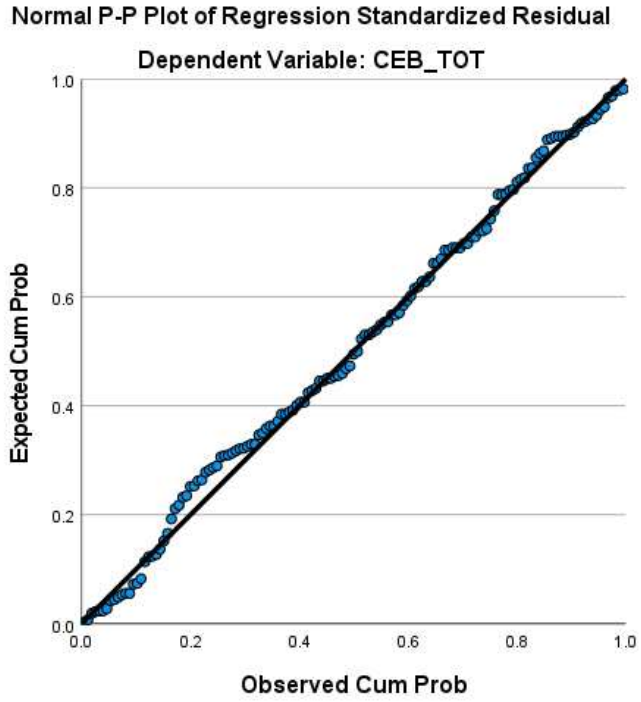


Figure 6

Performance Environment Histogram

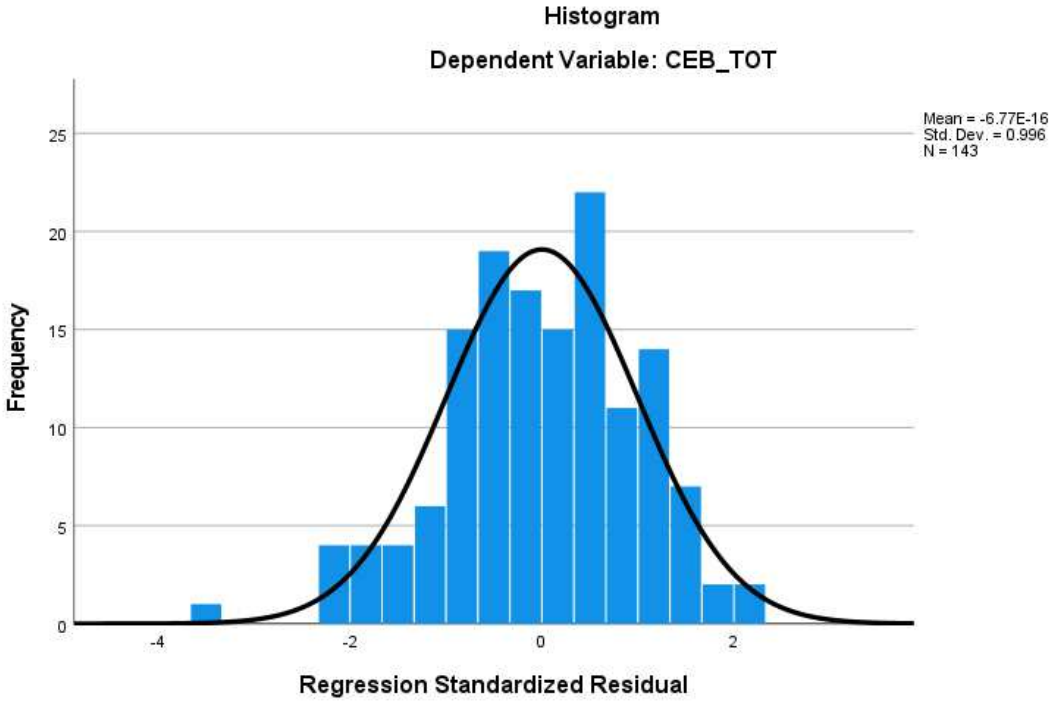
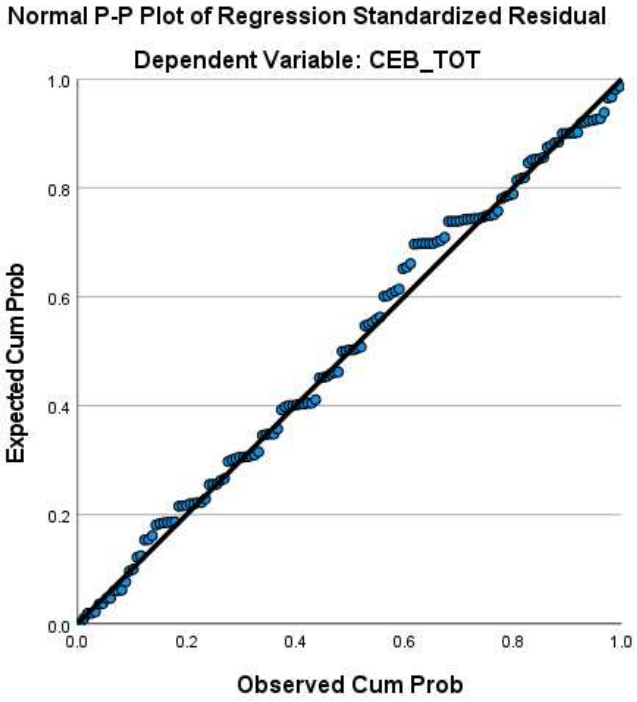


Figure 7

Performance Environment P-P Plot



Error variance was tested by plotting the regression standardized predicted value versus regression studentized deleted residual, with Collective Efficacy Belief scores as the dependent variable. The scatterplot of standardized residuals showed that the data met the assumptions of homogeneity of variance and linearity for positive preparation (Figure 8) and performance environment (Figure 9).

Figure 8

Positive Preparation Scatterplot

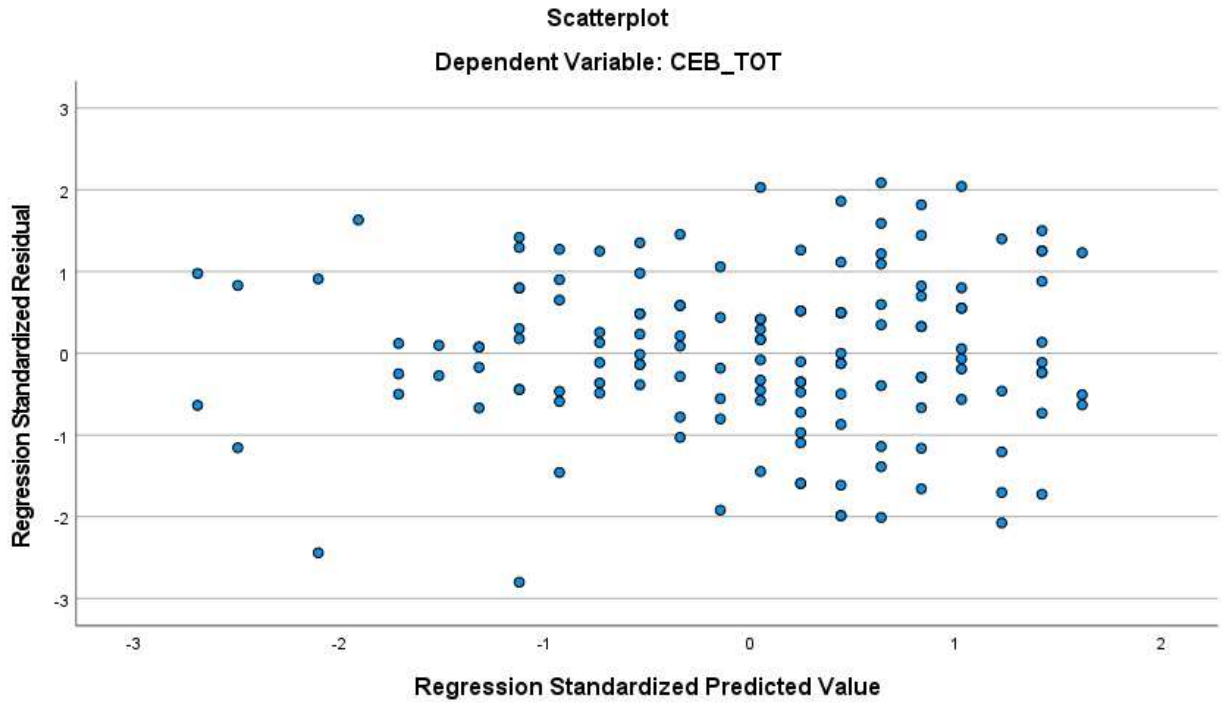
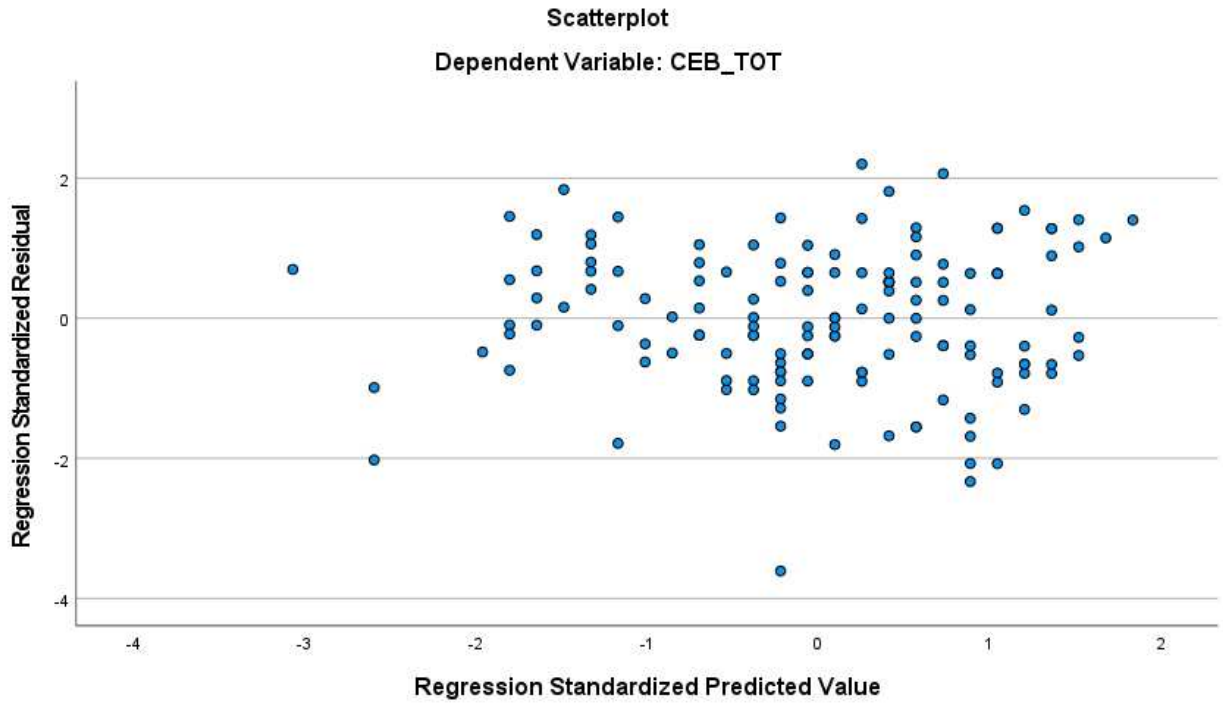


Figure 9

Performance Environment Scatterplot



Tests for leverage (h) and Cook's distance (D) were performed to identify outliers in the data. There were no outliers identified for positive preparation ($0 < h < .05$, $0 < D < .12$) or performance environment ($0 < h < .07$, $0 < D < .12$).

Tests to see if the data met the assumption of collinearity indicated that multicollinearity was not a concern (positive preparation, Tolerance = .64, VIF = 1.57; performance environment, Tolerance = .64, VIF = 1.57).

The Durbin-Watson statistic indicated that errors were independent for positive preparation ($DW = 1.82$) and for performance environment ($DW = 1.97$).

Research Question 4

Finally, a moderator analysis of three background factors was conducted through IBM SPSS Statistics (Version 27). The independent and dependent variables were continuous and the

three background factors each had three levels (Table 6). The path models for the moderator analysis are shown in Figure 10.

Table 6

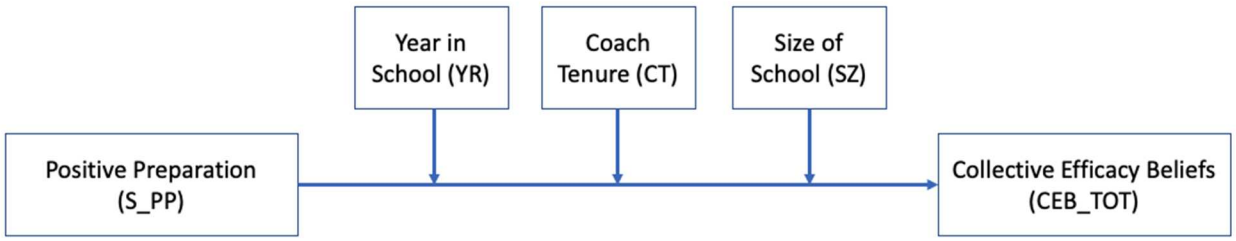
Frequency Tables for Background Factors Year in school, Coaching tenure, and Size of school

Factor	Level	Frequency	%
Year in school	Fall 2020 is my second season	70	49.0%
	Fall 2020 is my third season	32	22.4%
	Fall 2020 is my fourth season or more	41	28.7%
	Total	143	100.0%
Coaching tenure	Fall 2020 is 1, 2, or 3 seasons	25	17.5%
	Fall 2020 is 4, 5, 6, or 7 seasons	19	13.3%
	Fall 2020 is 8 seasons or more	99	69.2%
	Total	143	100.0%
Size of school	Fewer than 5,000	28	19.6%
	5,000 to 10,000	64	44.8%
	More than 10,000	51	35.7%
	Total	143	100.0%

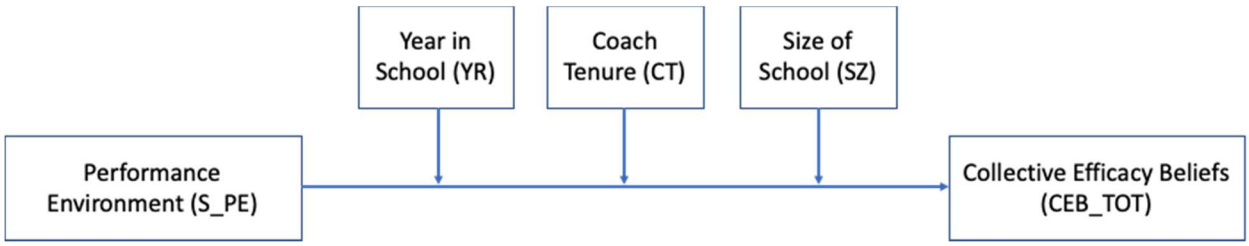
Figure 10

Path Models for Moderator Analysis of Background Factors

Model 1



Model 2



The histogram of standardized residuals indicated that the data contained approximately normally distributed errors for Model 1 (Figure 11) and Model 2 (Figure 12).

Figure 11

Model 1 Residual Histogram

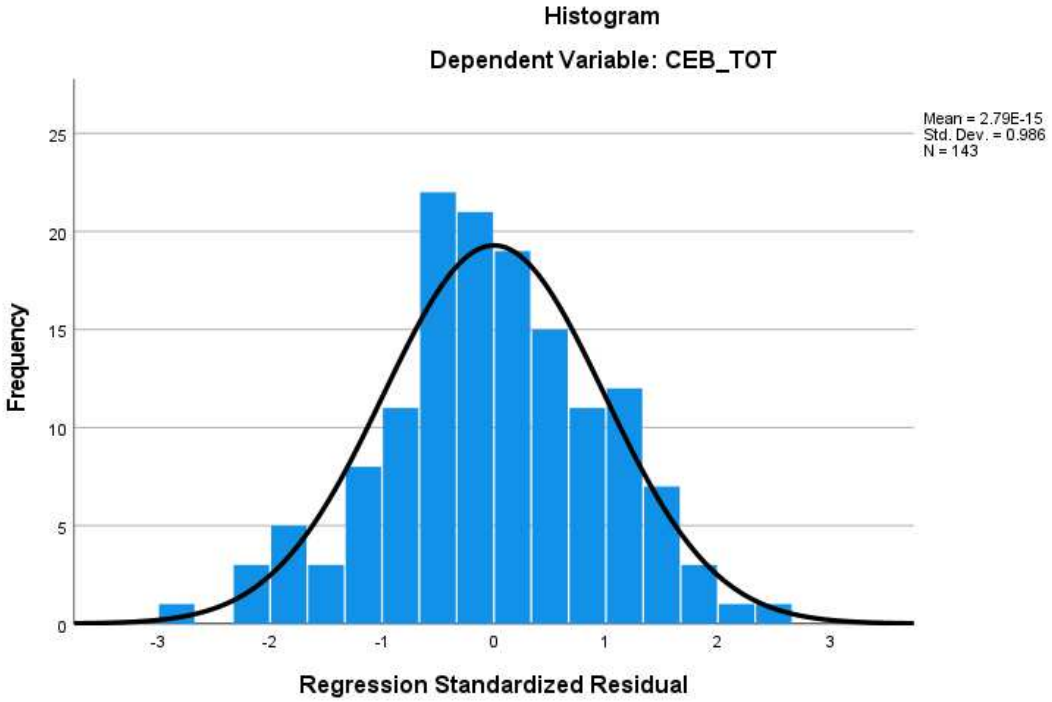
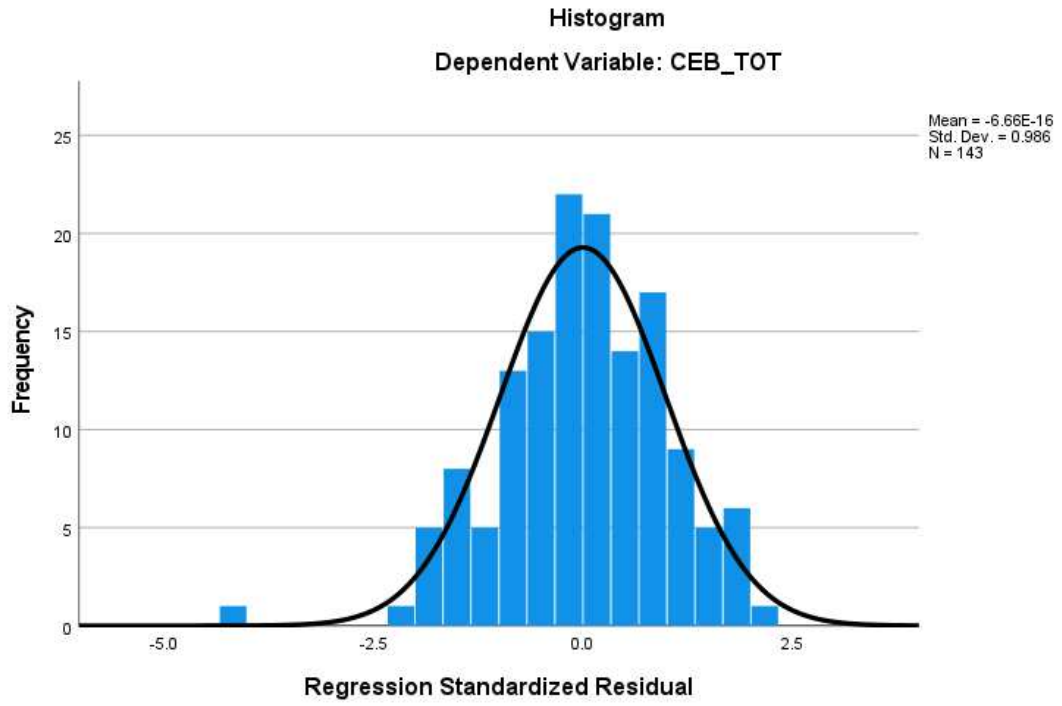


Figure 12

Model 2 Residual Histogram



Error variance was tested by plotting the regression standardized predicted value versus regression studentized deleted residual, with Collective Efficacy Beliefs Total as the dependent variable. The scatterplot of standardized residuals showed that the data met the assumptions of homogeneity of variance and linearity for Model 1 (Figure 13) and Model 2 (Figure 14).

Figure 13

Model 1 Scatterplot

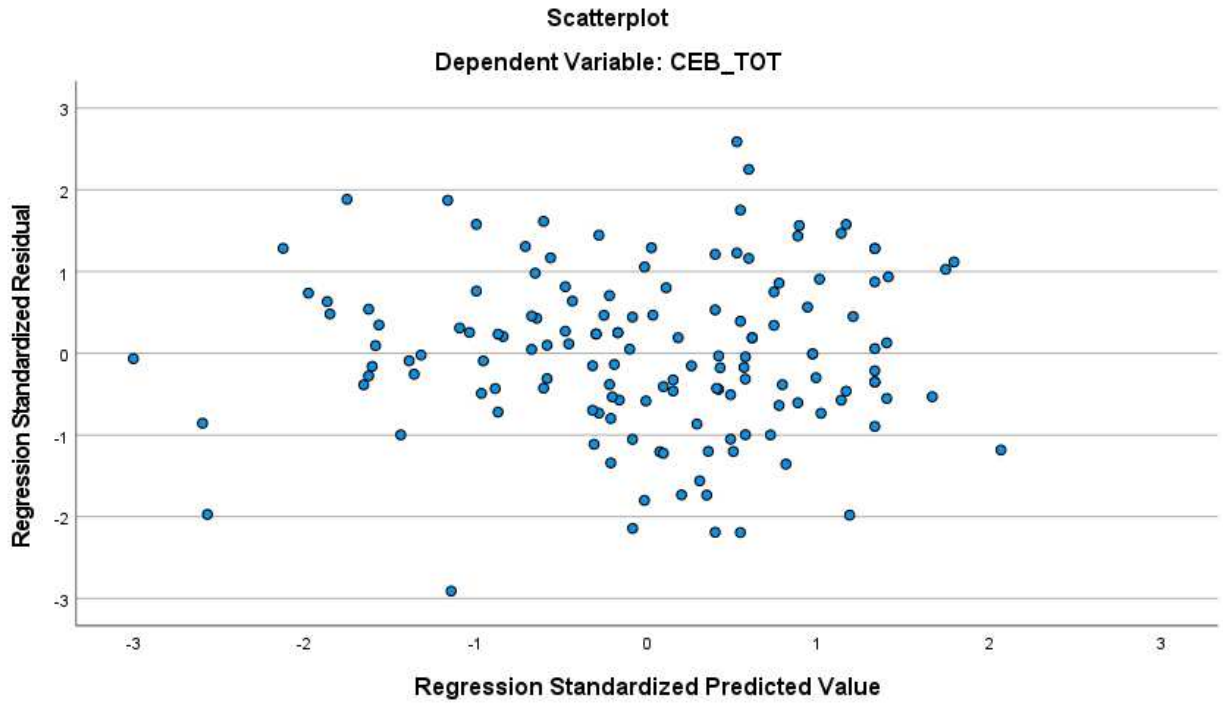
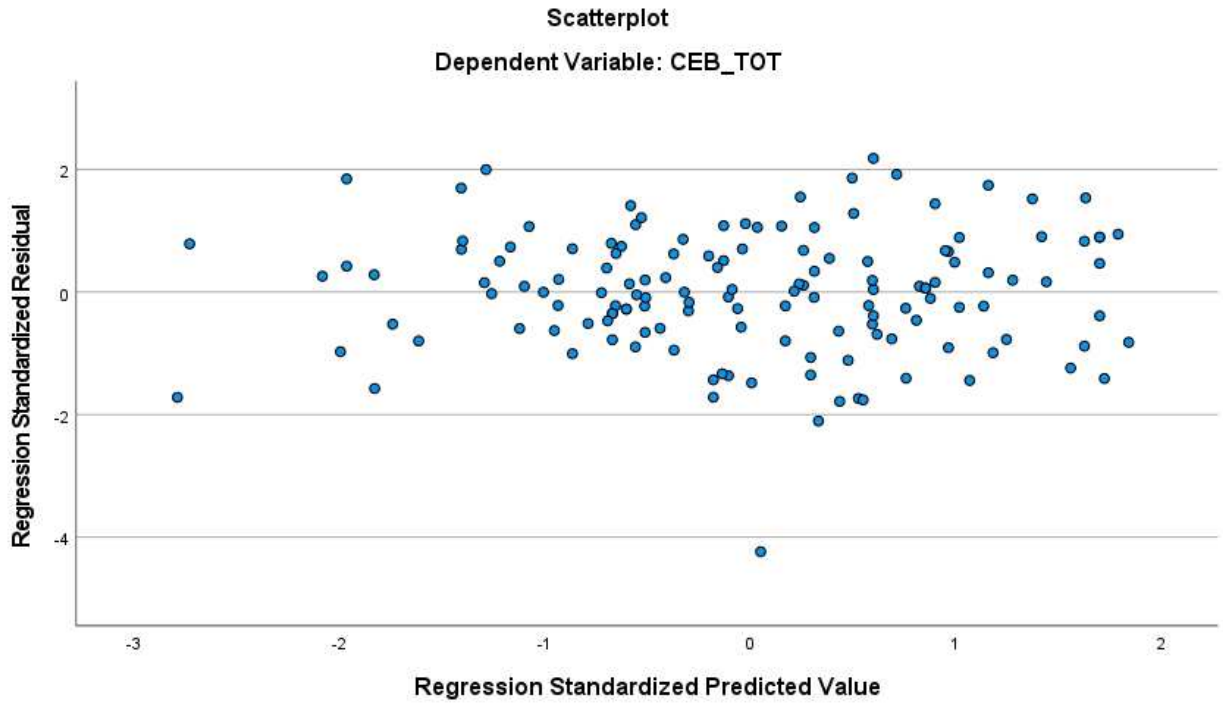


Figure 14

Model 2 Scatterplot



The Durbin-Watson statistic indicated errors were independent for both models (DW = 2.025). Tests for leverage (h) and Cook's distance (D) were performed to identify outliers in the data. There were no outliers identified ($.004 < h < .113$, $0 < D < .113$).

Tests to see if the data met the assumption of collinearity indicated that multicollinearity was not a concern for Model 1 (Year in school, Tolerance = .98, VIF = 1.02; Coaching tenure, Tolerance = .91, VIF = 1.10; Size of school, Tolerance = .82, VIF = 1.22; Positive preparation, Tolerance = .77, VIF = 1.30) or Model 2 (Year in school, Tolerance = .99, VIF = 1.01; Coaching tenure, Tolerance = .97, VIF = 1.02; Size of school, Tolerance = .96, VIF = 1.04; Performance environment, Tolerance = .99, VIF = 1.01).

Two moderation analyses were then performed using positive preparation and performance environment as independent variables and year in school, coaching tenure, and size

of school as moderators. Multiple linear regression results showed no significant effects for any of the interaction variables when Collective Efficacy Beliefs were regressed onto positive preparation and performance environment, respectively.

However, background factors did show significant main effects on the relationships between positive preparation and Collective Efficacy Beliefs (Table 7) and performance environment and Collective Efficacy Beliefs (Table 8).

Table 7

Mean-Centered Regression Values for Positive Preparation

Variable	Standardized Beta	*t*	Sig.
PP	.695	9.901	.000
Year in school	-.246	-3.972	.000
Coaching tenure	-.042	-.651	.516
Size of school	-.233	-3.431	.001

Note. PP is the acronym for positive preparation.

Table 8

Mean-Centered Regression Values for Performance Environment

Variable	Standardized Beta	*t*	Sig.
PE	.647	11.010	.000
Year in school	-.307	-5.208	.000
Coaching tenure	.134	2.256	.026
Size of school	-.012	-.203	.839

Note. PE is the acronym for performance environment.

Chapter 5

The research questions explored in this study focus on the nature of college sports in the United States. It is informative to examine how athletes' collective efficacy beliefs are influenced by context in a sport like soccer, which is played in almost every country around the world. College life in the United States, and the addition of athletic competition at the highest amateur level, creates unique circumstances for the development and sustainment of collective efficacy beliefs in NCAA Division I soccer teams. The responses gathered in this study suggest that coaches of college soccer may benefit from a strategic approach to enhancing collective efficacy beliefs and that coaches can ensure sources of collective efficacy beliefs are being addressed in their program with positive preparation and a conducive performance environment. Both positive preparation and the performance environment were significant predictors of collective efficacy beliefs with similar contributions to the strength of those beliefs. Additionally, responses from NCAA Division I college soccer players indicated that self-regulation and team inclusivity were useful factors for describing collective efficacy beliefs. Finally, a moderation analysis of background factors showed that the size of school and athlete's year in school may impact how well positive preparation translates into collective efficacy beliefs, and that size of school and coach tenure may impact how well the performance environment translates into collective efficacy beliefs.

Sources of Collective Efficacy Beliefs (Research Question 1)

Theoretical Implications

The main difference between the Sources of Collective Efficacy Beliefs scale in this study and previous scales is that this research proposed group leadership and group cohesion as sources alongside Bandura's (1997) four sources, instead of assessing leadership and cohesion as moderators of the relationship between Bandura's four sources and collective efficacy beliefs or assessing their isolated influence on collective efficacy beliefs.

The two factors extracted from the confirmatory factor analysis (CFA) for the Sources of Collective Efficacy Beliefs scale were interpreted as positive preparation (PP) and performance environment (PE). The positive preparation factor comprised items from the proposed sources mastery experiences (ME), physiological and affective states (PH), and group cohesion (CO). The performance environment factor comprised items from the proposed sources vicarious experiences (VC), verbal persuasion (VP), group cohesion (CO), and group leadership (LD).

The identification and validation of positive preparation and performance environment does two important things for college soccer coaches. First, for NCAA Division I soccer players, coaches now have a more parsimonious model to use for interventions. Although informed by Bandura's (1997) four sources, the sources of collective efficacy beliefs in a Division I soccer context can be influenced by coaches through interventions based on just those two concepts.

Second, there is now preliminary evidence that group leadership and group cohesion are two emergent qualities that support the development of collective efficacy beliefs in a college soccer context. Previous research has shown the supporting role group leadership and group cohesion play in the development of collective efficacy beliefs (Hampson & Jowett, 2012; Heuze, Fontayne, & Rimbault, 2006), but this study extends the research by showing how

Bandura's hypothesized sources of collective efficacy beliefs work in concert with the two emergent group characteristics to create the foundation for the development of those beliefs.

The retention of all three ME items in the positive preparation factor reinforces the content validity of the Sources of Collective Efficacy beliefs scale. Indeed, mastery experience has been repeatedly cited as the most influential source of self- and collective efficacy beliefs (Bandura, 1997, 2006; Chase et al., 2003; Feltz & Lirgg, 2001). Vicarious experience, verbal persuasion, and physiological and affective states are also cited by Bandura (1997) as sources of collective efficacy beliefs. Although not every item from those three sources was retained in the factors identified in this study, it is noteworthy that all three sources are represented for NCAA Division I soccer teams across the two factors.

Three of four items from the group leadership source and two of three items from the group cohesion source were retained across the two factors. Group leadership and group cohesion are the two sources of collective efficacy beliefs proposed in this study in addition to Bandura's (1997) four sources. The fact that the group leadership items showed strong loadings on a single factor provides initial support for the importance of group leadership in developing the performance environment. The importance of this group attribute was suggested by Chen and Bliese (2002) in a military setting and seems to have support in a collegiate athletics environment as well. The performance of leadership items from this study supports the importance of peer leadership suggested by previous research (Fransen et al., 2014; Fransen, Vanbeselaere, et al., 2015). However, the results of this study advance that understanding by evaluating leaders through the full complexity of their sport (not just isolated skill performance) and by assessing leaders with their own teams (rather than inserting confederates into unfamiliar teams). In similar fashion, the leadership behaviors of coaches were assessed by leadership items

LD1 and LD2 in the current study, supporting previous findings about the positive impact of creating a performance environment where mastery was valued above outcomes (Heuze, Sarrazin, et al., 2006; Kao & Watson, 2014; Magyar et al., 2004).

Additionally, the grouping of leadership items with verbal persuasion items under the same factor is supported by previous research which found that motivational speeches given before and during competitions, among other leader behaviors, can have a positive impact on collective efficacy beliefs (Skrla & Goddard, 2002; Vargas-Tonsing & Bartholomew, 2006). Similarly, the presence of vicarious experience items with leadership items suggests that coaching behaviors that "create an environment where…development is important" (LD1) should include opportunities to "watch video of ourselves in training and games" (VC2).

Group cohesion also supported the positive preparation and performance environment factors, although the two retained cohesion items (CO1 and CO2) were split across the two factors. Previous research has cited the connection between leadership behaviors and interpersonal relationships when assessing collective efficacy beliefs (Chou et al., 2013; Sudha et al., 2016). This may explain why CO2 (which asked about how much the team liked each other and got along on and off the field) loaded with the leadership items under the performance environment factor.

When compared with CO2, CO1 is a more task-related item, supporting previous findings about the importance of shared goals for collective efficacy beliefs (Filho et al., 2015; Fransen, DeCroos, et al., 2015). Previous research also supports the distinction between task-related and social-related items when assessing the impact of different types of group cohesion (Carron et al., 1985), and suggests that task-related cohesion is more important than social-related cohesion for collective efficacy beliefs in sports teams (Kozub & McDonnell, 2000; Paskevich et al.,

1999). The current study posits that both task and social group cohesion may contribute to collective efficacy beliefs, but in the context of different overarching factors.

It is also interesting that mastery experiences and vicarious experiences did not load on the same latent factor. The perception of vicarious experience as a form of mastery experience was suggested by Bruton et al. (2014) in their study of college-aged basketball players. The researchers in the 2014 study found that basketball players increased their collective efficacy beliefs after watching a video of themselves performing well, and their discussion suggested that part of this effect was due to the mastery experience aspect of watching positive video. This may be explained by the way the VC items were worded in this study; that is, VC1 asked athletes if they improved their performance from watching *other* teams play well (a condition that Bruton et al. [2014] found to be less desirable than a team watching themselves), and VC2 asked athletes if they improved from watching themselves in training and games, but did not specify if the film they watched was of *positive* performances (a condition that Bruton et al. [2014] found to be more adaptive for collective efficacy beliefs than neutral or negative video). Further research into the relationship between vicarious experiences and mastery experiences could be useful for coaches designing video interventions with their teams.

The removal of all reverse-scored items may have theoretical implications as well. Reverse-scored items VC3R, VP3R, PH3R, CO3R, and LD4R all failed to load with the other items from their respective sources. It is tempting to attribute this effect to the reverse-scoring wording, which can create problems when not evenly balanced with items worded in a straightforward way and a lack of conceptual congruence for respondents when they give responses on opposite ends of the scale (i.e., the positive strength of *completely true* v. the negative strength of *completely false*; Roszkowski & Soven, 2010). Reverse scoring can also be

problematic due to the interaction of reverse scored items with respondent characteristics like age or level of education (Rodebaugh et al., 2011). In the current study, characteristics such as gender and level of competition, among other factors, may have affected the validity of reverse-scored items.

For VP3R, which asked respondents about how often they received negative feedback from their coach, research conducted in achievement settings and the experience of the researcher suggest that negative feedback decreases the beliefs of female athletes more than male athletes (M. Johnson & Hegelson, 2002; Roberts & Nolen-Hoeksema, 1994). These findings may be influenced in sport by the gender of the coach giving the feedback as well. Research shows that female athletes perceive male coaches to be more aggressive, demanding, and competent than female coaches, which may influence how they interpret negative feedback; that is, as informational rather than as a personal attack, and as expert insight rather than something to be ignored (Bush & Naples, 2011; Frey et al., 2006).

Additionally, according to Bandura (1997), a performance that a coach characterizes as poor can act as a springboard to greater achievement. At the NCAA Division I level, where many players are receiving athletic scholarship money and may have professional aspirations, negative feedback with instructional content is often considered an important coaching tool in the context of holding athletes accountable and motivating them to perform better (Vargas-Tonsing & Guan, 2007). In my experience coaching at the Division I level, I have worked with numerous athletes who responded to negative feedback with increased motivation and performance. As a result, high collective efficacy beliefs scores in this study for the VP1 and VP2 items, which ask about positive feedback from coaches and teammates, may not be correlated with item responses pertaining to negative feedback (VP3R). Finally, it is possible that the underperformance of

VP3R is related to previous findings on the relative unimportance of verbal persuasion when compared with mastery experiences, vicarious experiences, and physiological and affective states (Chase et al., 2003). Further research into the informational content of negative feedback could provide coaches with an effective formula for the composition of that feedback with respect to collective efficacy beliefs.

Variance in responses to LD4R may be a result of competitive level. LD4R asked respondents if their "coaches and team leaders emphasized winning at all costs". Previous research has shown that a mastery-oriented environment, when compared to a performance-oriented environment, resulted in higher levels of collective efficacy beliefs (Chase et al., 2003; Heuze, Sarrazin, et al., 2006) However, in some environments a performance orientation could be perceived as a positive attribute, in that it incentivizes doing whatever it takes to win. Coaches like Bobby Knight (Indiana University men's basketball) were famous for their emotional outbursts aimed at players, but there is no question that Knight's teams were successful (Becker, 2009). This could mean the wording of the LD4R item in this study is too vague and was interpreted in various ways by survey participants. A better question may be to ask athletes if the "win at all costs" mentality was propagated through negative feedback and unhealthy competition between team members.

Additionally, future research could look at the relationship between such outcome-focused collective efficacy beliefs items and differences in NCAA Division level, what contract year the head coach is in (for coaches with multi-year deals), or the average time a head coach remains in their position following unsuccessful seasons at a particular institution. The hypothesis is that coaches at lower NCAA levels (i.e., Division II and Division III), coaches with multiple years left on their contract, and coaches at institutions with more tolerance for

objectively unsuccessful seasons in terms of wins and losses would be less concerned with outcomes and could focus more on process goals. Responses to LD4R may also reflect gender differences in the rewards for winning, as winning in men's college sports often carries outsized financial and prestige benefits when compared to women's college sports (Hattery et al., 2007).

The PH3R item, which asks respondents if their team "felt anxious and nervous about playing a good opponent," may have been problematic for three reasons. First, asking respondents to accurately assess the emotions of their teammates requires the ability to interpret various verbal and nonverbal cues, based on varying levels of knowledge about their teammate's behaviors, which can be difficult (Bandura, 1997). Secondly, anxiety and nervousness can be positive influences on efficacy beliefs for athletes if other factors like task complexity and the individual's cognitive appraisal are at appropriate levels for the athlete to perform at an optimal level (Zaichkowsky & Baltzell, 2001). Finally, the way information is provided to athletes in preparation for competition can influence how athletes interpret anxiety and nervousness. Before a difficult competition, athletes tend to want high informational and emotional content from their coach (Vargas-Tonsing & Guan, 2007). For this study, there could have been differences in how coaches provided pregame information, and how that information correlated with the perceived difficulty of the competition for which the information was provided.

It is most difficult to interpret the separation of the CO3R item, which asks respondents if their "team was mostly concerned with individual statistics and awards." The intent for this item was to see if individualist behaviors affected team cohesion and the perceived commitment to team goals. First, there could be a gender effect. As found in previous studies, female college soccer coaches, who exclusively coach female teams at the Division I level, are seen by their athletes as more skilled with interpersonal relationships, which could create a more team-first

mentality (Frey et al., 2006). Additionally, it is possible that respondents are part of programs with different levels of success. Successful teams may not care about individual accolades because their team success is so evident. Likewise, members of unsuccessful teams may only care about individual success because they do not feel team success is possible. It could be informative to ask respondents about the winning percentage of their team in the previous year(s), or about their perception of historical team success and compare it to perceptions of individualist behaviors.

Of the reverse-scored items, only VC3R, which asked respondents if watching professional teams play improved their team performance, contributed to one of the latent factors in the Sources of Collective Efficacy Beliefs CFA model. However, it did not enhance the overall fit of the two-factor model. As with the previous reverse-scored items, this could be explained in part by the level of the athletes surveyed for this study. Division I soccer players are considered among the elite of the amateur soccer population in the U.S. Although the literature suggests that watching professional teams play could have a negative effect on efficacy beliefs due to the perceived discrepancy between skill levels of players (Bandura, 1997), Division I soccer players often have professional aspirations and view professional players as aspirational role models rather than players whose skill level is beyond their reach. There are also myriad levels of professional soccer in the U.S. and around the world, indicating that not all professional games will feature the same skill level. Indeed, some professional leagues are not far removed in ability level from the top NCAA Division I teams. Future research could examine this nuance by asking players at what level they aspire to play after they finish their college careers. The hypothesis is that players who have the highest professional aspirations (i.e., the top professional leagues in a particular country) would see more positive impact on efficacy beliefs from viewing

professional matches than those that planned to end their soccer careers once they completed their college eligibility.

Overall, the two-factor model for Sources of Collective Efficacy beliefs was an acceptable fit, with certain items that stood out as the weakest contributors to model fit. PH1 was absorbed well into the positive preparation factor but showed a weak squared multiple correlation value of .27. This may be explained by the wording of the item, which asked respondents if their team from Fall 2019 was "physically fit and mentally prepared to play." Asking respondents to characterize their physical and mental preparation in a single response could have resulted in ambivalent responses, as teams could be strong in both areas, weak in both areas, or a combination of strong and weak. Contrast this item with PH2, which asked respondents if their team "felt happy and positive about each upcoming game." The specific focus on positive emotions in the latter item may explain its more robust squared multiple correlation value of .62.

Item CO2 was similar to item PH1, showing acceptable absorbed variance for the performance environment factor but had a weak squared multiple correlation of .28. CO2 asked respondents if their "team liked each other and got along well on and off the field." Potential problems with this item may come from different competitive environments at different programs. In the researcher's experience coaching at the Division I level, coaches take different approaches to the relationships between players on and off the field. The low squared multiple correlations for both CO2 and PH1 which were retained in the final CFA model may explain some of the lack of model fit.

Practical Implications

The distribution of the proposed Sources of Collective Efficacy Beliefs across two distinct factors is interesting and useful to college soccer coaches for several reasons.

First, the identification of these two factors suggests that coaches looking to increase collective efficacy beliefs in their teams can take a broad approach to their interventions. Coaches often assess their effectiveness through their ability to enhance technical and tactical qualities in their teams, sometimes by creating complicated exercises with multiple on-field problems for players to solve. Technical proficiency in soccer can be measured by looking at how well teams perform specific tasks, such as getting shots on target and winning aerial duels for the ball with the opponent. Tactical proficiency can be measured by a team's ability to adapt and perform well in response to different game conditions and formations. However, the strategic ability of the coach, defined by Hackman (2002) as how well the coach sets the conditions for the team to be successful, can be overlooked. Strategic actions taken by the coach include employing systems to ensure the team is properly prepared to compete, and creating an environment where the correct behaviors are consistently rewarded, among other things. Providing opportunities for teams to have success in training, reinforcing good performances with video, providing the right feedback at the right time, attending to the emotional and physical health of the team, propagating a shared vision, and ensuring roles and expectations are understood are all tactics that support a broader adaptive coaching strategy.

The emphasis on evaluating coaches based on technical and tactical proficiency may be explained by the false certainty created through the simple, objective statistics used like number of passes connected and time of possession, for instance. The Sources of Collective Efficacy Beliefs scale can measure the strategic proficiency of coaches and provide insight into how

coaches can set the conditions for their tactical and technical expertise to influence desired performance outcomes.

Based on the results of this study, college soccer coaches could view increasing collective efficacy beliefs as their strategic role, implemented by enhancing the sources of those beliefs: positive preparation of their team and the design of the performance environment. This study validates the importance of focusing on those two sources through interventions designed around mastery experiences, vicarious experiences, verbal persuasion, physiological and affective states, group leadership, and group cohesion.

Collective Efficacy Beliefs (Research Question 2)

Theoretical Implications

The main difference between the Collective Efficacy Beliefs scale proposed in this study and previous scales is that this research includes college-specific items alongside on-field measures of efficacy beliefs, instead of attempting to isolate one or the other. The results of this study suggest that a domain-specific measure of collective efficacy beliefs should include items from multiple areas of a student-athlete's life, not just what they do on the field.

The two factors extracted from the CFA for the Collective Efficacy beliefs scale were interpreted as self-regulation and inclusivity. The self-regulation factor comprised items from general efficacy, academics, structural, and social factors, respectively. The inclusivity factor comprised items from structural and social factors, respectively. It is important to note that the inclusivity factor only included two items from the Collective Efficacy Beliefs scale, so it is just identified but not validated as a dimension of collective efficacy beliefs. Future research in this area should include a more robust set of questions to explore inclusivity in college soccer teams.

Items in the collective efficacy beliefs questionnaire reflected college soccer player's beliefs about their ability to perform as a team, but also considered the unique nature of the college environment when compared to youth and professional environments. College athletes are a special population, and often experience significant academic pressure at various times during the academic term, experience fatigue due to the structure of away competitions and the associated bus and plane travel and feel stress about managing their dual identities as students and athletes in the campus social environment (Ting, 2009). Academics, social pressures, and the structure of college soccer will affect student-athletes' confidence in their ability of their team to self-regulate and create an inclusive environment.

The concept of self-regulation in teams builds on Bandura's (1997) assertions that without self-regulation, an individual's motivation, goal-setting behaviors, personal development, and overall effectiveness will suffer. The same assertions can be made about groups, as Bandura (1997) discusses in his section on organizational functioning. Previous research also shows that teams that can self-regulate and self-manage can have higher levels of efficacy beliefs and be more effective in workplace settings (Hackman, 2002; Millikin et al., 2010). Although an examination of the variables that affect relative performance levels in self-managing teams is beyond the scope of this research, this study supports the idea that self-regulation and self-management may also characterize efficacy beliefs in athletic settings. This research suggests that accurate measurement of collective efficacy beliefs in college soccer teams requires an instrument that assesses self-regulatory efficacy beliefs on the field, in the classroom, through structural obstacles, and in response to social pressures.

The presence of specific academic, structural, and social items within the self-regulation factor advances research on athletic teams as well. Chase et al. (2003) were the first to

demonstrate the separate influence of outside factors on the collective efficacy beliefs of sports teams in their study of high school basketball players. Although there is a large body of research that reports on the academic challenges for NCAA Division I athletes (e.g., Antshel et al., 2016; Huml et al., 2019), there is no research that links academic factors to collective efficacy beliefs. This link is important for coaches who want to help their athletes reach both academic and athletic goals. Academic items in the current study (AC2 and AC4) both loaded on the self-regulation factor, suggesting that academic self-regulation (i.e., attending classes after morning workouts and managing academic workload during examination periods) may be part of a broader self-regulatory ability for a college soccer team.

Additionally, previous research found that student-athletes often experience tension due to conflicting academic and athletic identities (Beauchemin, 2014; Killeya-Jones, 2005) and struggle to maintain academic standards when their travel schedule takes them away from campus for multiple days in a week (Cosh & Tully, 2015). The results from this study failed to support the hypothesis that the difficulties of travel and balancing expectations of faculty and coaches would impact collective efficacy beliefs, as AC3 (studying while traveling) and AC5 (balancing faculty and coach expectations) did not support either of the latent factors. This could be attributed to differences in academic rigor at the various institutions represented in the study. It is possible that some soccer players did not need to study while traveling or did not experience any difficulty balancing faculty and coach expectations due to light academic workloads.

It was interesting that items GE2 and AC2 loaded well on the Collective Efficacy Beliefs self-regulation factor when the CFA was performed, but items GE1 and AC1 did not. The multiple levels of these two items may explain the difference. Items GE1 and AC1 ask respondents if their team “adheres to the summer strength and conditioning program 75% of the

time" and if they have "75% of the team attend[ing] a morning class after an early morning workout." Items GE2 and AC2 ask the same questions, but substitute "100% of the time" and "100% of the team." There is variance in how connected athletes are over extended breaks like summer and how diligent they are about holding each other accountable. Also, NCAA rules prohibit coaches and staff members from tracking workouts during the periods when students are not in classes, which adds more variability to how accurate athletes are in assessing the behaviors of their teammates (NCAA, 2019b). Coaches are not allowed to send a tracking update to the group to motivate athletes that are not adhering to the program. Therefore, it is possible that some survey participants play in programs where summer strength and conditioning programs are not followed strictly by athletes at home on their own, or that if they are, that information is not shared among the group members. This could result in athletes taking an "all-or-nothing" approach in their responses to items AC2 and GE2, instead of a nuanced assessment of different levels of self-regulatory behavior when the group is not together.

Although the model was a good fit for the data, there are several adjustments that could enhance model fit. First, multiple retained items from the Collective Efficacy beliefs scale showed low multiple squared correlations; that is, < .3. These items were AC2, ST2, SO2, and GE2. Potential issues with items GE2, AC2, and SO2 have already been discussed. Item ST2, which asks respondents about their confidence in the ability of their team to perform "in a game after a bus ride of TWO hours or more" may suffer from the somewhat arbitrary designation of a two-hour threshold. My intent was to distinguish between very short road trips and longer road trips, highlighting the difficulty of spending hours on a bus and then being required to perform athletically at a high level (Hanton et al., 2005). The structure of college soccer often features multiple hour bus trips on the same day of a competition. For instance, at my current institution,

bus rides to competition sites up to four hours away are considered “day trips”, where the team travels, plays, and returns to campus on the same day. It is possible that setting a higher threshold of three hours would have aligned item ST2 better with the fatigue-based structural challenges of items ST3 and ST4 (both of which loaded on the same factor with item ST1), which asked respondents about their confidence in team performance after shortened recovery time and when experiencing fatigue late in games or late in the season.

Practical Implications

The identification of self-regulation and inclusivity as dimensions of collective efficacy beliefs indicates that academic factors, social factors, and structural factors do enhance understanding of the environment of NCAA Division I soccer players. These three factors are constants in college soccer and, along with on-field performance factors, describe collective efficacy beliefs through the self-regulation and inclusivity of a team. Coaches can use the scale proposed in this study to identify specific academic, social, and structural issues in their programs. Coaches can be confident that by improving student-athlete scores in these three college-specific areas they will be able to enhance the collective efficacy beliefs of their teams.

The first factor, self-regulation, was interesting because it included items from all four proposed subscales: general, academic, structural, and social. Defining that factor as self-regulation made sense because of the unique nature of college soccer. First, soccer is a sport that allows less coaching during competition than other sports. There is only one break (aside from timeouts for injury) and the players are often too far away from the coaches to be effectively coached while the game is progressing. This means players must solve problems and make tactical adjustments independently. Additionally, soccer is a fluid and dynamic sport, where conditions are changing constantly. There are few choreographed plays in soccer, aside from

corner kicks and free kicks, which means soccer teams are rarely executing a precise pattern of movements that has been well-rehearsed in training.

Also, soccer teams at the college level face difficulty in self-regulation that professional and youth teams do not. First, there is the added pressure of college academic requirements (Aries et al., 2004). Collegiate student-athletes are often away from home for the first time and responsible for managing their schedules and meeting academic deadlines without parental oversight. Second, there is the social pressure of balancing athletic identity with student identity in multiple social groups on campus (Marx et al., 2008). Finally, there is the structure of college soccer which requires significant bus travel and short recovery periods between competitions that are often only 72 hours apart (Soligard et al., 2016). Student-athletes are supported by athletic training staff and coaches but also have responsibility for managing their nutritional needs, sleep hygiene, and overall physical well-being. All of this means that strong collective efficacy beliefs in Division I college soccer players are built partly on strong efficacy beliefs for self-regulation.

It was not surprising that the second factor, inclusivity, emerged for college soccer teams. There is turnover every year on college rosters as seniors graduate, freshmen join the team, and transfers move in and out. Additionally, most teams rely on at least some of the incoming freshmen and/or transfer players to contribute during competitions in their first year with the team. It is a rare college soccer team in which only returning players feature in games. Therefore, it makes sense that the items ST1 and SO2, which ask about the team's confidence in their ability to "collectively incorporate new players" and "collectively make incoming players feel like they are ready to contribute" were important dimensions of team efficacy beliefs.

Finally, because of the short NCAA soccer preseason period (approximately 2 weeks from the report date in early August until the first regular-season match), teams must define roles

and begin to perform collectively without much preparation. This is a challenge that is unique to college soccer. In both youth and professional soccer teams, preseason is a lengthy process that often includes multiple months of preparation. This research adds to the literature by confirming the inclusivity challenges that college soccer teams face and connecting them to the collective efficacy beliefs of the team. As with self-regulation, strong collective efficacy beliefs in Division I college soccer players are also built partly on strong efficacy beliefs for inclusivity.

External Validity

The Pearson correlation results between the outcome expectancies scale and the scales measuring sources of collective efficacy beliefs and the collective efficacy beliefs themselves require some interpretation as well. The pilot study results from April 2020 suggested a range of acceptable values for the correlation between outcome expectancy scores and the sources and beliefs scales, respectively, of $.4 < r < .6$. The upper threshold was based on the strength of the correlation in the pilot study between the similar constructs of self-efficacy beliefs and sources of self-efficacy beliefs. The lower threshold was based on the strength of the correlation between the related but distinct constructs of self-efficacy beliefs and collective efficacy beliefs. The correlation between collective efficacy beliefs scores and outcome expectancy scores ($r = .54$) was at the higher end of the designated range, and the correlation between sources of collective efficacy beliefs scores and outcome expectancy scores was above the designated range ($r = .72$). So, what accounts for the unanticipated higher correlation between outcome expectancies and the sources of collective efficacy beliefs when compared to that of outcome expectancies and collective efficacy beliefs themselves?

One indicator is the Pearson correlation between the Outcome Expectancies Scale and the positive preparation subscale ($r = .83$), which is larger than any of the other outcome expectancy

correlations with source or collective efficacy beliefs subscales. Half of the items in the positive preparation subscale (three of a total six) are related to mastery experience as a source of collective efficacy beliefs. The positive relationship between collective efficacy beliefs and performance outcomes has been demonstrated by multiple researchers (Gully et al., 2002; Myers et al., 2007), and mastery experience is often cited as the most influential source of efficacy beliefs (Bandura, 1997, 2006; Chase et al., 2003; Feltz & Lirgg, 2001). This suggests that a subscale composed of multiple mastery experience items would correlate more strongly with a scale that assesses beliefs about performance outcomes than other subscales that feature less influential sources like vicarious experiences and verbal persuasion.

Additional support for this explanation comes from Bandura (1997) who explained the strong influence of mastery experiences on efficacy beliefs in terms of the quantifiable nature of the source, i.e., a past performance is something you can measure and will not change. This contrasts with more qualitative items from the performance environment subscale of the Sources of Collective Efficacy Beliefs scale, which asks respondents about the emphasis on effort and development, improving performance from watching other teams play, and being encouraged in practice and games.

Predicting Collective Efficacy Beliefs (Research Question 3)

Theoretical Implications

The independent variables in the path model specified for Research Question 3 accounted for a significant amount of the variance in collective efficacy beliefs scores. performance environment was shown to be a better predictor of collective efficacy beliefs by a slight margin over positive preparation based on R^2 values. Although the two factors explain 77% of the variance in collective efficacy beliefs scores, there is still almost a quarter of the variance in

collective efficacy beliefs that is not explained by the items that comprise positive preparation and performance environment in this study. A more precise scale for sources of collective efficacy beliefs may be helpful, which could address mastery experience, vicarious experience, verbal persuasion, physiological and affective states, group leadership, and group cohesion in more specific ways, helping coaches to define positive preparation and the performance environment.

This more precise scale could consist of items that add further domain specificity to the items used in the current study. For instance, instead of asking athletes if their "team performed well in games" (ME1), researchers could ask athletes if their "team was able to build on good performances throughout the season," which may indicate that their preparation for each upcoming competition had a positive influence on their collective efficacy beliefs. Likewise, instead of asking athletes if their "team liked each other and got along well on and off the field" (CO2), researchers could ask athletes if they "had multiple opportunities provided by coaches to engage in team bonding activities throughout the fall season." This second item would focus the response more on the conditions set by the coach that enhance team cohesion, rather than focusing on the outcome, which is that the team likes each other and gets along. There are multiple other modifications that could be tested in the areas of vicarious experience, verbal persuasion, physiological and affective states, and group leadership.

Practical Implications

Positive preparation and performance environment were shown to have similar predictive value for collective efficacy beliefs in NCAA Division I soccer teams. This suggests that coaches should place equal emphasis on the two factors when making strategic decisions for their programs. The positive preparation factor reflects the importance of coaching behaviors that

extract the right information from each performance and encourage athletes to interpret that information in an adaptive way. This is because past performances and other mastery experiences do not enhance collective efficacy beliefs by themselves; they need to be framed and interpreted as successes by the team (Bandura, 1997). Equal emphasis should be placed on creating an environment where feedback from team leaders and coaches supports the positive preparation and sets the conditions for athletes to know that their contributions are important to the group's success. In a Division I soccer program, that could mean frequent video sessions, positive rewards for performance in training and games, consistent feedback for all athletes regardless of amount of playing time, and an emphasis on the interdependence of the group to achieve shared goals.

Moderating Effects of Background Factors (Research Question 4)

Theoretical Implications

There was no significant moderating effect found on the relationship between Sources of Collective Efficacy Beliefs and Collective Efficacy Beliefs for year in school, coaching tenure, or size of school. Because the relationship did not change at different levels of the background factors, it may be that the levels of each moderating variable were not appropriate. It was hypothesized in this study that more experienced players would see a weaker connection between the collective efficacy beliefs and their sources as would players with less experienced coaches, and players at larger schools. The lack of significant moderation could mean that the programs represented have a robust causal relationship between sources of collective efficacy beliefs and collective efficacy beliefs. In other words, positive preparation and the performance environment predict collective efficacy beliefs despite the potential for increased identification with the team (Marx et al., 2008) or conversely, poor results to alter the relationship in the case

of the year in school variable. Similarly, the robustness of the relationship between sources and collective efficacy beliefs may minimize the effect of players' belief in their coach based on tenure (Coaching tenure; Atkinson, 2017) or their ability to integrate with the larger campus community (Size of school; G. Wilson & Pritchard, 2005).

Of the main effects found for the background factors, the athlete's year in school was the strongest, showing significant negative effects for the relationship between collective efficacy beliefs and both positive preparation and performance environment. This suggests that the longer student-athletes have been in their program, the less predictive positive preparation and the performance environment are for their collective efficacy beliefs. This effect is present in literature on efficacy beliefs and may be explained in part by the attributions athletes in this study made for their team's past performances (Bandura, 1997; Tasa et al., 2007). Athletes on teams that do not perform well over multiple seasons may see their beliefs erode over time if they attribute their performance to a lack of ability or to the lack of proficiency demonstrated by their opponents (i.e., their coach schedules only games they are sure they will win). This erosion could be exacerbated by athletes who further attribute their lack of success to a performance environment where skill development is not emphasized and where challenging but attainable goals are not being set (Feltz & Lirgg, 2001). Younger athletes may have a more positive outlook based on their lack of experience in a program and could feel like they have more control over the factors that contribute to team success, leading to higher collective efficacy beliefs (Allen et al., 2009; Marx et al., 2008; Murray et al., 2020).

Size of school also had a negative main effect, but only for the relationship between positive preparation and Collective Efficacy Beliefs. This suggests that positive preparation is less predictive of collective efficacy beliefs at larger schools. There could be multiple

explanations for this effect. positive preparation is composed of items from mastery experiences, physiological and affective states, and group cohesion. As J. E. Johnson et al. (2013) found, student-athletes can have trouble balancing the expectations of coaches and faculty as they go through their careers. This may be more pronounced at schools where class sizes are larger and relationships less personal between student-athletes and faculty, with negative implications for the emotional health of the student-athlete (Stone, 2012). Additionally, maintaining group cohesion can be a challenge at larger schools where the student-athletes are involved in other activities outside of athletics that do not include their teammates. At smaller schools, like the one where the researcher coaches, non-athletic activities often provide opportunities for further interaction with teammates.

Coaching tenure had a positive main effect on the relationship between performance environment and Collective Efficacy Beliefs. This indicates that the longer a coach is at their school, the more their performance environment (composed of items from group leadership, vicarious experience, verbal persuasion, and group cohesion) helps to predict the collective efficacy beliefs of their athletes. Although there is no research into this effect, leadership could contribute through an increased emphasis on development from coaches who have longer tenure and are more comfortable in their role. Additionally, as coaches gain experience in their job, their ability to expand and refine video preparation and coach a roster of players that they have recruited personally may lead to a more trusting coach-athlete relationship and more impactful verbal interaction.

Practical Implications

Coaches often have little control over the background factors discussed here as moderating variables, aside from choosing which institutions they work for. However, coaches

should be aware of how collective efficacy beliefs may fluctuate over the course of an athlete's career based on their experience as an individual (i.e., playing time in games) and the team accomplishments (i.e., perception of team success and team prospects for future success). Additionally, coaches should work to create a developmental culture in their program where athletes receive consistent feedback and have multiple resources to learn and improve. Finally, coaches at large schools should be aware of how the priorities of a Power 5 athletic department (for example) may affect the filters their student-athletes use to evaluate their team performances, and how the social integration of their student-athletes affects their overall emotional health.

Future Research

The results of this study suggest that a strategic approach to setting conditions within NCAA Division I soccer programs could enhance collective efficacy beliefs. Maximizing the adaptive influence of those conditions requires awareness and management of individual, team-level, and institution-level characteristics. For example, a coach may create a performance environment where roles are explicitly defined for each player (i.e., LD2). However, if the individuals in the program cannot overcome their unhappiness with a particular role, and play poorly as a result, team efficacy beliefs will suffer. An example at the team level is the setting of shared goals (i.e., CO1). If the coach and their staff cannot set goals that are achievable and meaningful, team efficacy beliefs could be negatively impacted. Finally, a coach who emphasizes positive preparation through physical fitness and mental preparation (i.e., PH1) would benefit from the presence of a strength coach and sports psychologist. Without these resources at the institution level, team efficacy beliefs might not be optimized.

Individual Characteristics

Future research should make clear the connection between individual characteristics and the strategic conditions set by the coach. As suggested by the pilot study in this research, self-efficacy beliefs and collective efficacy beliefs are moderately correlated. Referencing multiple studies, Barry and Finney (2009) stated that self-efficacy beliefs derive from persistence, goal setting behaviors, self-regulated learning, and the effective management of stress and anxiety. However, it is not currently known how strong that connection is. If coaches can understand how the sources of general self-efficacy beliefs in college athletes correlate with sport self-efficacy beliefs, and identify overlaps, they could potentially intervene to improve both with the same methods. Additionally, understanding which individual characteristics will flourish in a particular strategic setting could make teams more successful through more targeted recruiting by coaches.

Another example of an individual concept that could be studied in a collective context is growth mindset, which was discussed briefly in Chapter 1. Growth mindset does not directly impact efficacy beliefs, but it influences the resilience of those beliefs (Dweck, 2006). A strong growth mindset could manifest in the setting of consistently challenging goals, individual and team efficacy beliefs that do not diminish with failure, and the perception of setbacks as learning opportunities (Wood & Bandura, 1989). Based on the preliminary results from this study, coaches could use their strategic understanding of collective efficacy beliefs to set the conditions for a growth mindset to develop and flourish. The questions that must be asked include "What does a performance environment that emphasizes effort and development look like (LD1)?" How does this environment enhance grit and growth mindset? How do coaches help their team positively prepare by creating and fostering commitment to shared team goals for a season

(CO1)?" "How do we create self-regulation through our approach to academic success (AC2)?" "What makes a first-year player feel included enough to be ready to contribute to the team success (ST1)?"

Program Characteristics

Future research should look to examine how self- and collective efficacy beliefs evolve over the course of a student-athlete's college career in different programs. Indeed, much of the extant literature about student-athlete wellness and stressors emphasizes the concept of retention, and how the most vulnerable time for most college students is their first year. As Marx et al. (2008) found, many student-athletes (especially males) experience an athletic identity journey that flows from expectancy to disillusionment to reconciliation. It would be interesting to analyze how those changes in identity impact self-efficacy beliefs and ultimately collective efficacy of teams with a majority of freshman and sophomore athletes versus teams with more juniors and seniors.

When studying the group cohesion construct, it has been hypothesized that frequent changes in group membership may impact collective efficacy beliefs, especially in the absence of strong cultural norms (Gibson, 2003). To understand this concept more thoroughly, research should be conducted to link rates of retention among college teams to collective efficacy measurements. Significant research has already been conducted to understand the most important predictors of retention among college athletes (J. E. Johnson et al., 2013) and should be extended to examine the relationship between those predictors and group cohesion, especially in sports like soccer where task interdependence is high. J. E. Johnson et al.'s (2013) research was limited in that it only studies athletes at a Division I institution. Extending this research to DII and DIII institutions would likely provide more actionable conclusions for coaches across the NCAA.

Institutional Characteristics

Student-athlete satisfaction is another factor that could vary based on the institution. Higher levels of student-athlete satisfaction increase student-athlete retention, and retention leads to enhanced collective efficacy beliefs by limiting roster turnover (J. E. Johnson et al., 2013). College variables that impact satisfaction should be studied to improve retention and collective efficacy beliefs. Such variables might include size of school, distance from home, demographics of the region (i.e., primarily Caucasian), etc. A feeling of belonging could moderate the relationship between school size, race, amount of playing time, and individual v. team sport differences found by J. E. Johnson et al. (2013). As mentioned in the discussion on performance environment, future research should include analysis of how different types of institutions help or hinder student-athletes as they attempt to balance their academic and athletic roles (Marx et al., 2008).

Limitations

First, gathering data during the COVID-19 pandemic created logistical issues in that coaches were asking players to complete surveys in various locations; that is, at home with family, in another country, or while managing the stress of potential health issues within their family or community.

Second, the original research plan called for gathering data in the middle of the competitive season of Fall 2020, which may have elicited more accurate assessments of collective efficacy beliefs through temporal proximity, as teams would have been playing 1–2 matches each week (Bandura, 2006). Asking respondents to think back to their previous season (Fall 2019), following a truncated spring season in Spring 2020, may have skewed the reliability

of the data. Many players who responded had not played a competitive match since November 2019 when they completed the questionnaire in October 2020.

Finally, the composition of teams may have changed in the time between Fall 2019 and Fall 2020, and it is likely that there were at least a few players on each team (incoming freshmen or transfers) with whom returning players had never played a competitive match, much less an entire season. Asking respondents to assess the efficacy of the team when they are unfamiliar with all the strengths and weaknesses of their teammates could have skewed the results.

Discussion

SCT suggests that people relate to their environment through the bidirectional interaction of personal factors, environmental factors, and behavioral factors (Bandura, 1997). In a collegiate soccer setting, coaches attempt to increase their team's effectiveness by improving individual traits and skills (personal factors), enhancing the performance environment (environmental factors) and providing appropriate and timely feedback (behavioral factors). This study provides coaches with two factors that describe collective efficacy beliefs, and two factors that help assess the strength of the sources of those beliefs.

There is an important distinction for coaches between the scale developed for collective efficacy beliefs and the scale for the sources of those beliefs. Responses to questions about *sources* of collective efficacy beliefs (Research Question 1) help coaches understand if athletes are receiving efficacy information from the right places. This efficacy information can then translate into belief that the team can achieve desired outcomes. For collective efficacy beliefs themselves (Research Question 2), the responses reported in this study tell coaches which dimensions of collective efficacy beliefs need to be reflected in their measurement of those beliefs.

The two factors that emerged as the sources of collective efficacy beliefs suggest how coaches can set the conditions for collective efficacy beliefs through positive preparation and enhancement of the performance environment. The latent factors from the collective efficacy beliefs scale suggest that when measuring collective efficacy beliefs, coaches must account for soccer-specific tasks and the influence of college-specific factors like academics, social pressures, and structural characteristics.

These findings advance the research into collective efficacy beliefs in several ways. First, this study builds on previous studies that have attempted to measure collective efficacy beliefs and their sources in specific sports (Kozub & McDonnell, 2000; Magyar et al., 2004; Paskevich et al., 1999) and in generalized sport settings (Fransen et al., 2014; Petitta et al., 2015; Short, Sullivan, & Feltz, 2005). The results reported here measure collective efficacy beliefs and their sources in the specific context of the NCAA Division I athletic environment, and in the specific domain of soccer. This study therefore provides a foundation for future research that assesses collective efficacy beliefs in various college sports with varying levels of team interdependence, and for research into the differences between varying levels of collegiate competition (i.e., NCAA Division II, NCAA Division III).

Second, this research extends current sport-specific instruments that measure collective beliefs only for the performance of sport tasks, like checking and passing in ice hockey (Feltz & Lirgg, 1998). The proposed Collective Efficacy Beliefs scale in this study, with its self-regulation and inclusivity dimensions, suggests that collegiate soccer players rely on more than just performance information for their beliefs.

Finally, this study adds to the literature by suggesting that when measuring the sources of collective efficacy beliefs in collegiate athletic teams it is not sufficient to just translate

Bandura's (1997) four sources of self-efficacy beliefs into a group setting. Instead, the emergent qualities of group leadership and group cohesion should be added to the list of sources to fully define the dimensions of positive preparation and performance environment. Although a connection between self-efficacy beliefs and collective efficacy beliefs has been demonstrated (Watson et al., 2001), there are emergent sources of beliefs that will only have meaning in a team setting (Bandura, 1997). In this study, group leadership, group cohesion, vicarious experiences, and verbal persuasion came together to comprise the performance environment factor, and group cohesion, mastery experience, and physiological and affective states came together to comprise the positive preparation factors. This suggests that a more complete picture of the sources of collective efficacy beliefs must include both group leadership and group cohesion, and that they must be integrated with previously identified efficacy sources, not set apart.

Conclusion

For the Sources of Collective Efficacy Beliefs in NCAA Division I soccer players, this study found that a two-factor model fit the responses gathered. Those two factors were interpreted as positive preparation and performance environment. These findings support Bandura's (1997) assertion that sources of collective efficacy beliefs are similar to sources of self-efficacy beliefs, but also suggest that there is a more parsimonious model that guides coaches to focus on the positive preparation of their athletes in the context of an adaptive performance environment, and that this model should include the emergent qualities of group leadership and group cohesion.

For Collective Efficacy Beliefs in NCAA Division I soccer players, this study found that a two-factor model fit the responses gathered. Those two factors were interpreted as self-regulation and inclusivity. Self-regulation is a cornerstone of self-efficacy beliefs according to

Bandura (1997) and it is therefore not surprising that a valid measure of collective efficacy beliefs reveals a self-regulation dimension. Likewise, the inclusivity dimension follows from the emergence of group cohesion as a source of collective efficacy beliefs, combined with the unique structure of collegiate soccer.

This study found that positive preparation and the performance environment had almost equal predictive power for the Collective Efficacy Beliefs of NCAA Division I soccer players. The similar predictive power of each factor suggests that for college soccer players, the importance of mastery experience, physiological and affective states, and group cohesion (the sources that comprise positive preparation) is as important as that of vicarious experience, verbal persuasion, group leadership, and group cohesion (the sources that comprise performance environment).

The year in school of the athlete, coaching tenure, and size of school were not significant moderators of the relationship between Sources of Collective Efficacy Beliefs and Collective Efficacy Beliefs. However, the main effects found for year in school and size of school on the positive preparation-Collective Efficacy Beliefs relationship and the main effects found for year in school and coaching tenure on the performance environment-Collective Efficacy Beliefs relationship suggest further examination of the relationship between these background factors and the items that comprise each proposed source of collective efficacy beliefs.

Coaches now have preliminary confirmation that sources of collective efficacy beliefs like positive preparation and performance environment can result in increased beliefs that a team will be able to respond to the unique demands of the NCAA Division I soccer environment as reflected in the Collective Efficacy Beliefs scale. The Sources of Collective Efficacy Beliefs scale proposed here is a tool that coaches can use to assess how well they are creating the

conditions for the development of collective efficacy beliefs through positive preparation and the performance environment. The Collective Efficacy Beliefs scale proposed here is a tool coaches can use to measure the strength of the collective efficacy beliefs derived from those two sources. Coaches who can leverage efficacy information from these sources into efficacy beliefs on and off the field give themselves the best opportunity to maximize collective performance and achieve desired outcomes.

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Appendix A

Sources of Collective Efficacy Beliefs Scale

Based on **only your last fall season** (Fall 2019), please click on the response that best represents how False or True each statement is for YOUR TEAM

1 = Completely false
2 = Mostly false
3 = Somewhat false
4 = Somewhat true
5 = Mostly true
6 = Completely true

ME 01	My team performed well in games
ME 02	My team performed well in practice the day before a game
ME 03	My team performed well against highly-ranked teams in games
VC 01	My team improved our performance from watching another team play well
	VC 02 My team improved our performance from watching video of ourselves in training and games
	VC 03 My team improved our performance from watching professional teams play (reverse scored)
VP 01	My coaches often told our team that we are playing well
VP 02	My teammates often encouraged each other in practice and games
VP 03	My coaches often told us that we were not performing well (reverse scored)
PH 01	My team was physically fit and mentally prepared to play
PH 02	My team felt happy and positive about each upcoming game
PH 03	My team felt anxious and nervous about playing a good opponent (reverse scored)
CO 01	My team was committed to shared goals for the fall season
CO 02	My team liked each other, and got along well on and off the field
	CO 03 My team was mostly concerned with individual statistics and awards (reverse scored)
	LD 01 My coaches created an environment where effort and development were important
LD 02	My coaches made sure everyone understood their role in the team
LD 03	My coaches and team leaders made everyone on the team feel like they belonged
LD 04	My coaches and team leaders emphasized winning at all costs (reverse scored)

Appendix B

Collective Efficacy Beliefs Scale

Please indicate how CONFIDENT you are **right now** in your TEAM's ability to...

1 = Completely UNconfident
2 = Mostly UNconfident
3 = Somewhat UNconfident
4 = Somewhat confident
5 = Mostly confident
6 = Completely confident

GE 1	Adhere to the team summer strength and conditioning program 75% of the time or more
GE 2	Adhere to the team summer strength and conditioning program 100% of the time
GE 3	Maintain collective belief when you are playing poorly as a team and/or losing games
GE 4	Maintain collective motivation to improve when you are playing well as a team and/or winning games
GE 5	Overcome adversity and perform well in a game as a team (i.e. bad weather, conceding a goal, losing a key player to injury, teammates not getting along)
GE 6	Recognize as a team when tactical adjustments need to be made during the game
GE 7	Work collectively to implement tactical adjustments during the game
GE 8	Perform well as a team late in the first half/second half/in overtime of a game
AC 1	Have 75% of the team attend a morning class after an early morning workout
AC 2	Have 100% of the team attend a morning class after an early morning workout
AC 3	Study on the bus or in the hotel on team road trips
AC 4	Perform well as a team in games during a week with one or more midterm examinations
AC 5	Successfully balance the academic expectations of faculty with the athletic expectations of your coaches
SO 1	Collectively make decisions about nutrition, hydration, and sleep that support strong team performance when you are with non-athlete friends, or when parties and other social gatherings are happening
SO 2	Collectively make incoming players feel like they are ready to contribute to the team during their first two weeks on campus through team bonding events and consistent encouragement
SO 3	Integrate as a team with the campus community and not isolate yourselves from other non-athlete groups on campus
SO 4	Collectively manage the emotional stress of collegiate athletics in a healthy way
ST 1	Collectively incorporate new players and play well as a team within the first two weeks of preseason
ST 2	Perform well as a team in a game the same day as a bus ride of TWO hours or more

ST 3	Collectively recover from the previous game and perform well as a team with THREE days or less in between games
ST 4	Collectively overcome fatigue and perform well as a team in games at the end of the season (i.e. the last games of the regular season, conference tournament, NCAA tournament)

Appendix C

Outcome Expectancies Scale

Please indicate the ACCURACY of the following statements for your TEAM.

1 = Completely INaccurate
2 = Mostly INaccurate
3 = Somewhat INaccurate
4 = Somewhat accurate
5 = Mostly accurate
6 = Completely accurate

OES 1	I expect that we will win our next game
OES 2	I expect that we will finish in the top three in our conference in our next season
OES 3	I expect we will have three or more players recognized as all-conference performers in our next season (i.e., First, Second, Third, Honorable Mention, All-Rookie)
OES 4	I expect we will finish our next season with a top-25 NCAA national ranking

Appendix D

Informed Consent Letter

Dear Participant,

You are reading this letter because we need you to give us permission before we are allowed to collect survey responses from you. We hope that you agree to participate because we are interested in understanding your experiences as a college soccer player. Our goal is to use this information as a way to improve understanding of the college environment and team confidence.

WHAT WILL MY PARTICIPATION INVOLVE?
If you agree to participate in this research, you will complete an online questionnaire in October 2020. The survey should take about 15-20 minutes to finish.

ARE THERE ANY RISKS OR BENEFITS TO ME?
We don't anticipate any risks to you from participation in this study, and there are no direct benefits. The findings will be used to enhance understanding of how the college environment affects collective efficacy beliefs of student-athletes.

HOW WILL MY CONFIDENTIALITY BE PROTECTED?
The data from the online questionnaires will be anonymous. Your responses will never be associated with your identity. The researchers will not receive any identifiable information as a result of the questionnaire, and only group characteristics will be published.

WHOM SHOULD I CONTACT IF I HAVE QUESTIONS?
You may ask any questions about the research at any time. If you have questions about the research, feel free to contact the Principal Investigator, Jason Chen (jachen@wm.edu). Feel free to contact Dr. Chen if you decide that you do not want to participate in the study. If you have any dissatisfactions with any aspect of this study, please contact Dr. Thomas Ward, who is the Chair of the Committee for the Protection of Human Subjects at William and Mary.

Your participation is completely voluntary. If you decide not to participate, or if you decide to withdraw from the study, there will be no consequences to your participation in the rest of the project, nor will it affect your relationship with your own university or university administration. Your agreement to participate through checking the box below indicates that you have read this consent form, had an opportunity to ask any questions about your participation in this research, and voluntarily consent to participate. If you wish, you can request to receive a hard copy of this form for your records from Dr. Chen.

You are required to notify Dr. Ward, chair of the EDIRC, at 757-221-2358 (EDIRC-L@wm.edu) and Dr. Jennifer Stevens, Chair of the PHSC at 757-221-3862 (jastev@wm.edu) if any issues arise during this study.

Check one of the following:

___ YES, I agree to participate in the survey.

___ NO, I do not want to participate in the survey.

Participant's Name (**Please Print**):_____

Participant's Signature _____

Date: _____

VITA August 2021

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Experience

2000-2010 U.S. Army Engineer Officer

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