ASSOCIATION BETWEEN COACH BEHAVIORS AND ATHLETE EFFICACY BELIEFS: SELF-, OTHER-, COLLECTIVE, AND RELATION-INFERRED SELF-EFFICACY

by

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Confidence (i.e., efficacy) plays a pivotal role in sport, whether it is athletes' confidence in themselves, their coaches, or in their collective group. Studies have shown that athletes' self-efficacy, other-efficacy, and collective efficacy beliefs lead to beneficial outcomes, such as enhanced performance, effort, and persistence. While athletes' perceptions of coach behaviors are associated with their efficacy beliefs, no known research has utilized observed coaching behaviors when exploring this relationship. The purpose of this study was to directly observe coaches and examine how their behaviors (i.e., instruction and feedback, positive and negative evaluation, autonomy support, and motivational climate) predict athletes' self-efficacy, other-efficacy, collective efficacy, and relation-inferred self-efficacy (RISE) beliefs. The sample consisted of three coaches, and 64 athletes from NCAA Division I and III sports. Teams included Division I Women's Soccer (n = 19), Division III Men's Lacrosse (n = 35), and Division III Football (n = 10). Coaches were recorded at a single practice, and their behaviors were coded using the Assessment of Coaching Tone observational coding system (Erickson & Côté, 2015). Athletes completed surveys measuring their self-efficacy, other-efficacy, collective efficacy, and RISE. Initial analyses showed that the coaches differed in behavior use. The football coach directed the most behaviors toward individuals, the soccer coach was the most autonomy

supportive, and the lacrosse coach was the most mastery oriented. Furthermore, the football team reported higher self-efficacy than the soccer team, and higher collective efficacy than both the soccer and lacrosse teams. Multiple regression analyses revealed that none of the hypothesized coach behaviors were unique predictors of any forms of athlete efficacy beliefs. The findings contribute to existing literature on efficacy sources and provide directions for future research.

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CHAPTER I: INTRODUCTION

Coaches play a significant role in athlete sport experiences. As teachers of the game, coaches influence athletes' performance and a team's success by developing technical skills, directing the team, and implementing game plans. As leaders of the team, arguably the most crucial task for coaches is creating buy-in and eliciting confidence from the players—of which many successful coaches have been well-aware. Take for example Hall of Fame basketball coach Bobby Knight, who said, "to be as good as it can be, a team has to buy into what you as the coach are doing;" or Hall of Fame coach Phil Jackson who echoed this sentiment, saying the most important thing for a coach is "to get your players … to believe in what you're trying to accomplish." Through their influence, coaches can shape psychological outcomes in their athletes, such as athletes' confidence in themselves, in their coach, and the team. This research focuses on the relationship between coach behaviors and athlete confidence by exploring athletes' perceptions of self-efficacy, other-efficacy (regarding the coach), collective efficacy (regarding the team), and relation-inferred self-efficacy (RISE; regarding their coach's confidence in them).

Of the efficacy constructs, self-efficacy is the most recognized. Self-efficacy is a person's beliefs or perceptions about his or her ability to perform specific tasks that lead to the accomplishment of goals or desired outcomes (Bandura, 1977, 1982, 1995, 1997). In the sport context, self-efficacy is an athlete's beliefs in his or her capabilities to successfully execute the various physical and/or mental skills necessary to accomplish goals in the sport. Self-efficacy influences how people think, behave, and feel (Bandura, 1977, 1997). In sport psychology specifically, self-efficacy positively predicts outcomes such as athletes' performance, amount of effort exerted, and task persistence (Habeeb et al., 2019; Moritz et al., 2000; Schunk, 1995). It is

important that athletes develop strong positive self-efficacy perceptions, as these beliefs will benefit their overall sport performance and motivation.

Efficacy beliefs are present in interpersonal relationships as well, as Lent and Lopez (2002) theorized in their tripartite view of efficacy, which differentiates efficacy into three forms: self-efficacy, other-efficacy, and relation-inferred self-efficacy (RISE). Within this tripartite model is other-efficacy, which has gained increasing attention in sport psychology research. Other-efficacy is a person's perceptions of another person's capabilities. In the sport setting, other-efficacy can refer to a player's confidence in a specific teammate or, as will be the focus of this research, confidence in a coach. Athletes who have higher efficacy beliefs about their coach typically show more effort, are more committed to the coach, and receive more satisfaction from playing for the coach (Jackson & Beauchamp, 2010). The third form of relational efficacy, RISE is a person's beliefs about another's confidence in them, like how confident an athlete perceives their coach to be in the athlete's abilities (Lent & Lopez, 2002). These beliefs can lead to benefits such as satisfaction, performance, and motivation (Jackson et al., 2008). While Lent and Lopez focused primarily on dyadic relationships, Bandura (1982) extended efficacy perceptions to group-level beliefs.

Collective efficacy refers to a group's shared beliefs about its combined abilities in producing desired outcomes (Bandura, 1982, 1999, 2000; Watson et al., 2001). Whereas other-efficacy is an individual-level construct specific to each person involved, collective efficacy is a belief that is shared among a group (Dithurbide & Flett, 2014). In the sport context this would refer to a shared confidence among teammates in the team's ability to accomplish its goals (e.g., winning competitions). Perceptions of collective efficacy, according to Bandura (1982), influence "what people choose to do as a group, how much effort they put into it, and their

staying power when group efforts fail to produce results" (p.143). Of particular interest to coaches is the impact that collective efficacy beliefs have on team performance (Myers et al., 2004; Watson et al., 2001), which is often stronger than individual efficacy beliefs (Feltz & Lirgg, 1998).

While research has shown that athletes' perceptions of coach behaviors are associated with their efficacy beliefs (Forlenza et al., 2018; Jackson et al., 2009; Vargas-Tonsing, 2009; Vargas-Tonsing et al., 2004), no known research has utilized actual coach behaviors when examining this relationship. Instead, most of the studies use surveys that ask athletes or coaches to report perceptions of coach behaviors, and while this method has its strengths, it can become vulnerable to biased or inaccurate portrayals of how coaches truly behave. However, there is evidence that observed coach behaviors related to instruction and feedback are positively associated with other positive outcomes in athletes, such as enjoyment, competence, and positive evaluations of coaches (Horn, 1985; Smith et al., 1983; Smith & Smoll, 1990). To advance the knowledge of coach behaviors and their effects on efficacy, research will need to utilize behavior observation rather than the previously relied-upon perception data.

Previous coach observation studies have used observation systems like the Coach Behavior Assessment System (CBAS; Smith et al., 1977) and the Arizona State University Observation Instrument (ASUOI; Lacy & Darst, 1984), which focus on behaviors related to instruction and feedback (e.g., technical instruction and modelling, positive reinforcement and praise, and punishment and scold). A more recent observation system, the Assessment of Coaching Tone (ACT; Erickson & Côté, 2015), consolidates the teaching behaviors of the CBAS and ASUOI, and adds motivational climate and autonomy support. Motivational climates can either be mastery-involved (e.g., focus on mastering the task) or ego-involved (e.g., focus on the

outcome of the task). Autonomy-supportive coaches view their athletes as capable decision makers; their behaviors often provide choice. On the other hand, controlling coaches are more autocratic, not involving athletes in decisions or allowing them choices. Behaviors quantified by the ACT (i.e., instruction, positive and negative feedback, autonomy support, and motivational climate) are also related to various sources of athlete efficacy beliefs found in the literature.

The goal of this study is to explore how athletes' self-efficacy, other-efficacy, collective efficacy, and relation-inferred self-efficacy beliefs are associated with observed coach behaviors. Based on the current literature, it can be expected that observed coach behaviors will predict athletes' efficacy perceptions. Specifically, it is hypothesized that 1) training and instruction, positive feedback, autonomy-supportive behaviors, and mastery-oriented behaviors will be positively associated with athletes' efficacy beliefs; and 2) negative feedback, controlling behaviors, and ego-oriented behaviors will be negatively associated with athletes' efficacy beliefs. The findings of this study will aid in the development of coach interventions and coach education programs, as it will be based on objective coaching behaviors. Furthermore, the concepts examined will likely prove useful for other settings, such as in the workplace or the military, that often employ sport psychology approaches with their leaders and teams.

CHAPTER II: LITERATURE REVIEW

The following chapter will explore the current literature pertaining to efficacy beliefs, the role of coaches in relation to efficacy, and systematic coach observation. Within the review of the efficacy literature, the sections will explain self-efficacy, other-efficacy, collective efficacy, and relation-inferred self-efficacy (RISE) beliefs; their relation to athletics, and the various sources and outcomes of each. Key sources of efficacy will then be reviewed in more detail while describing the role of coaches in the context of each. Finally, the review will highlight the relevant literature related to systematic behavioral observation research in sports, and its contribution to the knowledge of coach behaviors. The goal of this review will be to describe the literature on efficacy beliefs and coach behaviors, and in doing so, identify the current gaps that this research aims to fill.

Self-Efficacy

Self-efficacy is a construct within social cognitive theory (SCT), and therefore is best understood within the broader context of SCT. Social cognitive theory states that there is a triadic reciprocal relationship between personal, behavioral, and environmental factors that all interact with and influence one another (Bandura, 1986). Bandura (1999) developed this theory as an alternative to existing behaviorist models, such as classical and operant conditioning, which view behavior as the mere product of external stimuli and reinforcement history. On the other hand, social cognitive theory is founded on an agentic perspective, in which humans are viewed as capable of exerting influence over what happens in their lives (Bandura, 1986, 1989, 1991). An individual's abilities to contribute to the aforementioned system of triadic reciprocal causation is referred to as personal agency, and self-efficacy beliefs are an individual's beliefs about his or her agentic capabilities (Bandura, 1982, 1986, 1989, 1997).

Bandura (1977) first introduced the concept of self-efficacy in the context of behavioral change therapies for severe snake phobics. It has since spread to all settings, even athletics. Bandura defined self-efficacy as the "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3). To illustrate self-efficacy in an athletic context, consider a baseball batter: There are many different environmental factors (e.g., weather, pitcher's abilities, umpire's decision, etc.) that the batter cannot control, but will determine the outcome of the at-bat. There are also factors within the batter's control that will determine the outcome of the at-bat. The batter's self-efficacy beliefs in this instance are his perceptions of those abilities within his control, such as emotional composure or batting technique. These beliefs influence an individual's cognitive (e.g., goal-setting or planning), motivational (e.g., effort and resilience), affective (e.g., stress), and selection (e.g., choice of actions or endeavors) processes (Bandura, 1989). In short, self-efficacy is a person's beliefs about his or her capabilities that influence how their environment, behaviors, and personal factors affect them.

In his initial framework, Bandura (1977) proposed four sources of efficacy information: performance accomplishments, verbal persuasion, vicarious learning, and emotional arousal. Performance accomplishments—later termed *enactive mastery experiences*—provide an individual with the physical, mental, and emotional experience of successfully accomplishing a course of action, which Bandura (1997) considered to be "the most authentic evidence" (p. 80) of one's capabilities. In qualitative studies, athletes consistently mention mastery experiences as sources of their efficacy beliefs (Jackson et al., 2008, 2009; Saville et al., 2014). Essentially, the more an athlete experiences success accomplishing goals, the higher his or her self-efficacy beliefs will be. Conversely, experiences of non-mastery can lead to lowered efficacy.

Verbal persuasion from significant others is a commonly used form of efficacy enhancement due to its "ease of use and ready availability," (p. 198) that conveys to individuals that they have the abilities necessary to accomplish a given task (Bandura, 1977). Within sport, verbal persuasion occurs through performance feedback, pre-performance motivational speeches, and general encouragement (Vargas-Tonsing et al., 2004; Weight et al., 2020). Bandura (1997) advises, however, that verbal persuasion will only strengthen a person's efficacy beliefs if it is reasonable or realistic. In other words, telling a novice swimmer that they are capable of matching Olympic times will certainly not increase the swimmer's self-efficacy appraisals. Studies on different forms of verbal persuasion have shown athletes' self-efficacy beliefs to be predicted by their perceptions of motivational persuasion, performance-contingent feedback, and informational content in pre-game speeches (Vargas-Tonsing, 2009; Wright et al., 2016). Thus, coaches should use verbal persuasion often to develop and maintain higher efficacy beliefs in athletes.

A person's self-efficacy beliefs are influenced by vicarious experiences (Bandura, 1977, 1997). To experience something vicariously is to see a similar person (e.g., someone similar in skill level or personal attribute) achieve certain attainments or successfully execute certain capabilities, which effectively demonstrates to the observer that they too could accomplish the given task (Bandura, 1997). For example, when a gymnast sees a teammate similar in skill level complete a cartwheel on the balance beam, her personal efficacy appraisals will increase. Coaches often employ vicarious teaching, or modeling, for a variety of purposes, such as modeling confidence to the team or demonstrating how to execute a technique or skill (Vargas-Tonsing et al., 2004; Weight et al., 2020).

Finally, efficacy appraisals can be influenced by emotional arousal—later termed physiological and affective states (Bandura, 1977, 1997). The physiological or emotional states experienced relative to an endeavor provide physical information on which people tend to judge their capabilities (Bandura, 1997). Most often this occurs as a function of physiological arousal, be it stress, excitement, or nervousness, which presents itself physically through increased perspiration, respiration, or heart rate. Part of this effect on efficacy beliefs is based on how the individual construes the information (Bandura, 1997). One person might attribute the arousal to being physically and mentally prepared to play, while another might attribute the same sensations to being nervous or stressed about playing.

As previously noted, self-efficacy beliefs influence a person's thought and behavior patterns, i.e., choice of activity, effort, etc. (Bandura, 1982, 1989). For many athletes and coaches, the most valuable outcome associated with self-efficacy is performance (Schunk, 1995). Many studies have documented the predictive function self-efficacy beliefs serve for performance success (Habeeb et al., 2019; Moritz et al., 2000). For example, Habeeb et al. (2019) found that cheerleaders' self-efficacy beliefs were significant predictors of their performances in pairs. Athletes are not unaware of self-efficacy's importance. In qualitative interviews, athletes have talked about the effect that self-efficacy has on their performance (Jackson et al., 2008, 2009). Some have even described ways in which it determines their behaviors during performances, as one athlete recalled taking "a few more shots" (p. 220) that he or she would not normally have taken in times when self-efficacy was not as high (Jackson et al., 2009). Taken together, it is evident that self-efficacy is a crucial attribute for athletes that coaches should work to develop to the best of their abilities.

Other-Efficacy

Developed by Lent and Lopez (2002), the tripartite view of efficacy posits three forms of efficacy beliefs involved in interpersonal relationships: self-efficacy, other-efficacy, and relation-inferred self-efficacy (RISE). Other-efficacy refers to "an individual's beliefs about his or her significant other's ability to perform particular behaviors;" in other words, the perceptions person A holds about the abilities of person B (Lent & Lopez, 2002, p. 264). Over the course of a relationship, both parties develop efficacy beliefs about their counterpart, which in turn influence thought patterns and behavioral patterns of the perceiver. Lent and Lopez (2002) suggested that these beliefs are informed by a variety of sources: past accomplishments of the other, experiences with similar others, third-party information about the other, social or cultural stereotypes, and personal aspects of the perceiver. In the coach-athlete relationship, these can refer to past achievements of the coach; the athlete's experiences with similar coaches in the past; information that people tell the athlete about the coach; sociocultural stereotypes related to the coach's demographics; or internal factors within the athlete that might shape his view of the coach.

Lent and Lopez's proposed sources of other-efficacy beliefs were later supported through qualitative research on coach-athlete dyads. Through interviews with coaches and athletes, Jackson et al. (2009) identified two higher-order categories that encompass the sources of other-efficacy information. The first category is athlete perceptions regarding the coach, which includes comparisons with past coaches, past achievements of the coach, information from others about the coach, the coach's motivation, compatible coaching style, and the coach's experience (Jackson et al., 2009). The second category, perceptions regarding the dyad, included mastery achievements as a dyad and contact time (Jackson et al., 2009). The findings of Jackson et al.

(2009) support and expand on the sources of other-efficacy beliefs from Lent and Lopez's model and provide insight into how the sources apply to athletics.

Although the sport psychology literature has studied reciprocal other-efficacy beliefs in both the athlete-athlete and coach-athlete relationship, this study will focus only on the athlete's perceptions of the coach's abilities. Efficacy beliefs about a coach, which have also been referred to as perceptions of coaching effectiveness or coaching competence (Kavussanu et al., 2008), have implications for athletes and coaches at all levels of sport. Evidence suggests that low other-efficacy beliefs in a coach contribute to inter- and intrapersonal consequences including decreased effort, decreased commitment to the coach, and decreased self-confidence (Jackson et al., 2009, 2010; Lent & Lopez, 2002; Mohd Kassim & Boardley, 2018).

Athletes' beliefs about the coach have significant impacts on interpersonal outcomes. The nature of sport requires an interpersonal dynamic between a coach and an athlete, such that both sides rely on the other to accomplish their goals (e.g., succeed in competitions), making the relationship between coach and athlete an essential component of sport. As a dyad, the coach-athlete relationship is affected by other-efficacy beliefs. Athletes with higher other-efficacy beliefs about their coach's abilities tend to feel more connected with the coach (Mohd Kassim & Boardley, 2018) and perceive better relationship quality with their coach (Jackson et al., 2010). Moreover, athletes with higher other-efficacy beliefs report communicating more with their coach, listening to their coach's teachings, and being more persistent in maintaining the relationship (Jackson et al., 2009). Based on this evidence, coaches should work to foster higher other-efficacy beliefs from their athletes.

Other-efficacy perceptions have intrapersonal consequences for athletes that contribute to overall performance ability, such as exerted effort (Lent & Lopez, 2002). In qualitative

interviews, athletes reported that other-efficacy perceptions of their coach can lead to increases in self-efficacy and motivation (Jackson et al., 2009). Similarly, Boardley et al. (2008) found that athletes' self-efficacy was predicted by their other-efficacy perceptions of their coaches' ability to teach technique. That is, athletes who are more confident in their coach's capabilities are also more confident in their own capabilities and feel more motivated. Some performance determinants identified in teammate efficacy research can also be translated to coach efficacy. In a team of volleyball players for instance, low other-efficacy beliefs about a teammate influenced decision-making (e.g., passing), led to increased distractibility and focus issues (e.g., they focused more on the teammate's performance), and increased pressure for the perceiver to perform better (Dithurbide & Flett, 2014). It is reasonable to suspect the same underlying process would translate to coach efficacy. For example, a quarterback with low other-efficacy beliefs about his coach might be too concerned with whether the coach is calling effective plays and not enough on reading the defense, resulting in poor execution of the play.

Relation-Inferred Self-Efficacy (RISE)

The third relational efficacy belief, Relation-Inferred Self-Efficacy (RISE), is a meta-perception of efficacy defined as "an individual's beliefs regarding how a significant other views the individual's efficacy at particular tasks or behavioral domains" (Lent & Lopez, 2002, p. 268). In other words, RISE refers to person A's beliefs about person B's confidence in person A. In the sport context, this could be an athlete's beliefs about how the coach views that athlete's abilities, or an athlete's beliefs about how a teammate views the athlete's abilities. Perceptions of RISE are influenced by intrapersonal (e.g., self-efficacy, past mastery achievements, motivation) and interpersonal (e.g., verbal and nonverbal communication) factors (Habeeb, 2020). Verbal behaviors identified as sources of RISE include general encouragement, efficacy-building

statements, instruction, and goal-setting by coaches (Jackson et al., 2008, 2009). Moreover, task-oriented statements which emphasize effort have been identified as positive sources of RISE (McMullen et al., 2020; Saville et al., 2014).

An individual's RISE beliefs have both intra- and interpersonal outcomes as well. Lent and Lopez (2002) suggested that RISE would lead to outcomes such as self-efficacy, relationship satisfaction and persistence, and coping with stress or slumps. Research has since supported and extended upon these outcomes. Relationship functioning (e.g., satisfaction, persistence, termination) has been the most commonly identified interpersonal outcome of RISE (Jackson et al., 2008, 2009). Based on these interviews, athletes who perceive their coaches to be more confident in them (i.e., higher RISE) are more satisfied with their coach-athlete relationships and work harder to maintain those relationships or remain in the relationships. Intrapersonal outcomes of RISE identified in the literature include self-efficacy, motivation, affective responses, and performance (Jackson et al., 2008, 2009; Saville et al., 2014). When athletes believe their coach is more confident in them, they are more confident in their own abilities and more motivated to put in the work necessary for performance. Athletes also reported feeling happier or more positive when they believed their coach was confident in them.

Having established that efficacy beliefs can extend beyond the individual and play into interpersonal relationships, it is now important to understand efficacy as a group-level construct. This is especially relevant in sports, where success is often reliant on interdependent performance of teams. While Lent and Lopez's (2002) relational efficacy beliefs apply to dyadic interpersonal relationships, Bandura's concept of collective efficacy extends even further to look at group-level beliefs.

Collective Efficacy

Recognizing that humans are inherently social beings, living and interacting interdependently to accomplish collective goals, Bandura (1982) proposed the existence of a group-level form of efficacy beliefs, termed collective efficacy. Bandura (1997) later defined collective efficacy as, "a group's shared belief in its conjoint capabilities to organize and execute the courses of action required to produce given levels of attainments" (p. 477). Similar to self-efficacy's influence in an individual, collective efficacy beliefs guide goal selection, courses of action, exerted effort, and task persistence in the face of adversity or failure (Bandura, 1982, 1997). Collective efficacy applies to practically every group setting, including athletic teams.

Most sports require that a group of individuals operate interdependently to accomplish desired outcomes. That is, athletes must function as a team to perform well. Therefore, in sports, collective efficacy refers to the beliefs shared among teammates about the team's collective capabilities to succeed or accomplish a goal. It may be argued that collective efficacy is not relevant in "individual" sports—those in which athletes compete alone without teammates (e.g., golf or swimming). However, at many levels of competition, individual sports still involve teams and teammates. For example, in swimming (excluding relay events in this case) each athlete swims as an individual and their time is based solely on their own performance; however, their individual time contributes to the collective performance of their team. Bandura (1997) uses the case of gymnasts, stating that, even though the level of interdependence in gymnastics is low, "the team attainment is the sum of the performances achieved independently" by the athletes (p. 403). As such, collective efficacy extends to individual sports.

Since Bandura's initial theorizing of collective efficacy, research has identified different sources of collective efficacy beliefs in sports, such as previous team performance and team size

(Feltz & Lirgg, 1998; Watson et al., 2001). Collective efficacy can also be influenced by perceptions of the motivational climate (Forlenza et al., 2018; Kao & Watson, 2014). Perceptions of certain coach behaviors have been identified as sources. Specifically, perceptions of autonomy supportiveness, positive feedback, and providing training and instruction can inform collective efficacy beliefs (Fransen et al., 2012; Hampson & Jowett, 2014; Høigaard et al., 2015). Additionally, there is evidence that coaches indirectly affect collective efficacy by shaping athletes' perceptions of their coaching capabilities, i.e., athletes' other-efficacy beliefs (Atkinson et al., 2018; Watson et al., 2001). In short, the major sources of collective efficacy in sports are athletes' perceptions of motivational climates, autonomy support, positive feedback, and training and instruction.

Collective efficacy is associated with several team outcomes. Bandura (1997) predicted that collective efficacy beliefs in sports teams would affect the team's "ability to remain perseverant and task oriented during periods when the team is struggling, and their capability to bounce back from wrenching defeats" (p. 402). Subsequent research has supported his predictions, as collective efficacy is a contributing factor of team resilience (Morgan et al., 2013) and directly affects task cohesion (McLean et al., 2020). Furthermore, teams with higher levels of collective efficacy tend to be more confident overall (Prussia & Kinicki, 1996) and set more challenging goals (Bray, 2004). Finally, collective efficacy is associated with increased team performance and success (Habeeb et al., 2019; Myers et al., 2004; Watson et al., 2001) For example, Myers et al. (2004) found that college football teams with higher collective efficacy had better performance outcomes in games, such as more passing and rushing yards, fewer turnovers committed, and more total points scored.

Some research suggests that collective efficacy is a stronger predictor of team performance than is individual efficacy (Feltz & Lirgg, 1998). This corroborates Bandura's assertion that even teams with a high sum of individual efficacy can often fail with low collective efficacy—a notion that is best illustrated by the 2004 U.S. Men's Olympic basketball team. This team lost more games than any of their predecessors and failed to win gold, despite being made up of extremely talented athletes. By advancing the knowledge of collective efficacy, the field of sport psychology will be able to better assist teams and to help avoid problems like those that may have affected Team USA in 2004.

Efficacy Sources and Coaches

The preceding review of the efficacy literature revealed that self-efficacy, other-efficacy, collective efficacy, and RISE beliefs share key common sources: training and instruction, performance feedback, motivational climates, and autonomy support, each of which is either an example of, or directly determined by coaching behaviors. The following section describes in more detail how each of these sources influence athletes' efficacy beliefs through athletes' perceptions of coaching behaviors. A point of emphasis here is that these associations are based on athlete perceptions, and not measured coach behaviors.

Training and Instruction

Training and instruction behaviors are those that teach athletes the technical or tactical skills of the sport, whether given spontaneously or in response to some event, with the goal of improving performance (Chelladurai & Saleh, 1980). Because coaches serve as teachers in sports, instruction is often the most used behavior by coaches. For example, Lacy and Darst (1985) observed 10 high school football coaches over the course of an entire season and found

that instruction made up nearly half (42.5%) of the coaches' behaviors. As such, it would be beneficial to understand the effects of these behaviors on efficacy beliefs.

Providing athletes and teams with the necessary skills, techniques, and knowledge increases their perceptions of their capabilities (i.e., their efficacy perceptions). Therefore, it would be reasonable to expect that training and instruction behaviors would be positively associated with athlete efficacy beliefs. Research has supported this, showing that perceptions of informational content in coaches' pre-game speeches significantly predict athletes' perceptions of self-efficacy (Vargas-Tonsing, 2009). Perceptions of coaches' training and instruction behaviors are positively associated with collective efficacy beliefs as well (Hampson & Jowett, 2014; Høigaard et al., 2015). A qualitative study by Forlenza and colleagues (2018) furthers these notions, as athletes report that effective teaching would enhance athlete and team confidence.

Moreover, by using these behaviors more, coaches demonstrate their own knowledge and capabilities related to the sport, which fosters other-efficacy beliefs athletes hold about the coach (Bandura, 1997). With evidence demonstrating a relationship between perceived instructional behaviors and athletes' efficacy beliefs, it can be reasonably expected that observed instructional behaviors should also be associated with athletes' efficacy beliefs. While technical instruction is the more direct method to convey information to athletes, coaches can also do so through feedback in response to performances.

Feedback

Performance feedback is a way for coaches to communicate positive or negative evaluative information to athletes about a performance attempt. This can be either verbal (e.g., "good job") or nonverbal (e.g., giving a thumbs up), and in response to a desirable or undesirable

performance. In the context of efficacy beliefs, Bandura (1997) classifies feedback as a subset of verbal persuasion and posits that it can have positive or negative effects on efficacy beliefs depending on how it is framed. Sport psychology literature has upheld this notion with quantitative and qualitative evidence that perceptions of positive feedback are related to increased self-efficacy (Forlenza et al., 2018; Saville et al., 2014; Schunk, 1995) and collective efficacy (Hampson & Jowett, 2014; Høigaard et al., 2015) in athletes and teams. By recognizing and verbally rewarding good performances, a coach is conveying to the player that they have the capabilities necessary to succeed in their endeavors, thus boosting the athlete's personal efficacy beliefs.

This functions similarly in teams. For example, when a basketball coach gives positive feedback to his team for their execution of game strategies, the team's collective efficacy beliefs should increase. Data has shown that collective efficacy beliefs are higher in teams whose coaches are perceived as using more positive feedback (Hampson & Jowett, 2014; Høigaard et al., 2015). To increase perceptions of positive feedback, and therefore increase efficacy beliefs, coaches need only increase the frequency with which they provide positive feedback. Coaches can use feedback to evaluate the effort of a performance to influence efficacy perceptions (Bandura, 1997), thereby contributing to a mastery climate.

Motivational Climates

The social environment of a team that influences whether athletes adopt mastery- or performance-oriented goals in given situations is the motivational climate (Balaguer et al., 1999; Nicholls, 1984; Papaioannou et al., 2004; Pensgaard & Roberts, 2002). There are two types of motivational climates: Outcome climates (also referred to as ego or performance climates) are those in which higher emphasis is placed on winning, talent, and social comparisons (Balaguer et

al., 1999; Nicholls, 1984). In these environments, mistakes are viewed as failures and are punished, and most attention is given to the best athletes. The other type of climate is a mastery climate. In mastery climates, coaches emphasize effort, learning, skill development, and self-improvement (Balaguer et al., 1999; Nicholls, 1984). In these climates, mistakes are not failures, but opportunities to learn and improve. As an environment in which failure is effectively nonexistent, a mastery climate inherently provides mastery experiences, which are a prominent source of efficacy appraisals (Bandura, 1977, 1997).

Mastery experiences are a source of self-efficacy (Jackson et al., 2009; Saville et al., 2014; Weight et al., 2020), other-efficacy (Jackson et al., 2008, 2009), collective efficacy (Chase et al., 2003; Kao & Watson, 2014; Magyar et al., 2004), and RISE (Habeeb, 2020). Therefore, coaches can increase athletes' efficacy beliefs through the establishment of mastery climates, in which mastery experiences are plentiful. Moreover, coaches can contribute to this environment by emphasizing and reinforcing effort, learning, and self-improvement. Qualitative research has provided valuable insight into what coach behaviors athletes desire most. When collegiate athletes were asked how coaches could improve confidence, their suggestions implied a desire for mastery climates: they wanted all players treated equally, rather than star players being treated as favorites, and they wanted coaches to create successful situations early on to show improvement (Forlenza et al., 2018).

Autonomy Support

Self-Determination Theory proposes there are three fundamental psychological needs, one of which is the need for autonomy (Deci & Ryan, 2000). Autonomy refers to the feeling of personal control over one's actions, or the sense that "actions are self-organized with respect to their inner and outer circumstances" (Deci & Ryan, 2000, p. 254). Because perceived autonomy

support can predict efficacy beliefs, it is important that coaches are autonomy supportive (Hampson & Jowett, 2014; Høigaard et al., 2015). Coaches can be autonomy supportive by giving athletes choices, including athletes in decision-making processes, or in other ways that allow athletes to exercise self-regulation over their actions. Behaviors that operate in an opposite way are controlling. Controlling behaviors remove the athlete's sense of autonomy, though they are not always inherently negative. For example, if a coach were complimenting a player for the skill he executed and said, "I want you to do that in the game," the athlete would perceive the coach as being more controlling, even if the athlete does not realize it. This adds to the difficulty of avoiding controlling behaviors, as they can be disguised as positive comments.

There is no shortage of research connecting athlete efficacy beliefs to coach-related factors. However, the literature pertaining to coaches' influences on efficacy is limited to athletes' *perceptions* of coaches' behaviors; no known research has looked at how observed coach behaviors relate to athletes' efficacy beliefs. This is a surprising gap in the sport psychology literature considering behavioral observation research has linked coaching behaviors to a variety of other positive outcomes.

Behavioral Observation Research

During the 1974–1975 college basketball season, Tharp and Gallimore (1976) first introduced systematic behavioral observation to sport psychology when they conducted a case study on the teaching behaviors of legendary UCLA basketball coach John Wooden. Their interest in Wooden was rooted in educational psychology literature and its need for more systematic observation research to understand pedagogical methods. Tharp and Gallimore's (1976) case study was the first known study to systematically observe and record coaching behaviors; as such, the researchers were tasked with developing a coding scheme. After eight

practices of watching and discussing Wooden's coaching, the researchers designed a coding system with 10 categories: *instructions*, *hustles*, *modeling-positive*, *modeling-negative*, *praises, reproofs* (or scolds), *nonverbal reward*, *nonverbal punishment*, a *"Wooden"* (reproof followed by reinstruction), *other*, and *uncodable* (Gallimore & Tharp, 2004; Tharp & Gallimore, 1976). The case study spanned 15 practices and resulted in 2,326 recorded behaviors over 30 practice hours, finding that 50% of Wooden's behaviors were instructions (Tharp & Gallimore, 1976). Other coach behavioral observation systems were developed in the years following, the most popular being the Coach Behavior Assessment System (CBAS; Smith et al., 1977) and the Arizona State University Observation Instrument (ASUOI; Lacy & Darst, 1984), both of which are used to assess instruction and feedback-related coach behaviors.

In 1977, Smith, Smoll, and Hunt developed the CBAS specifically for use in athletic settings. The CBAS is focused mostly on instruction and feedback and contains 12 behavior categories, classified as either reactive or spontaneous. Reactive coach behaviors are those made in response to desirable or undesirable player behaviors (e.g., *positive reinforcement* in response to a desirable performance, or *mistake-contingent technical instruction* in response to an undesirable performance). Spontaneous coach behaviors are those that are not triggered by, or in response to, a preceding event (e.g., *general encouragement*, *general technical instruction*). Many researchers have used the CBAS and other behavioral observation methods in descriptive case studies of coaches. In line with the findings of Tharp and Gallimore, these case studies consistently showed that instruction is the most used behavior among successful coaches (Becker & Wrisberg, 2008; Bloom et al., 1999; Lacy & Darst, 1985). Smith and Smoll advanced the utility of coach observation, using the CBAS to look at how observed coach behaviors influence athletes' psychological outcomes.

Smith and Smoll, along with various colleagues, produced several years of research demonstrating the associations between observed coach behaviors and youth athletes' psychological outcomes. Using data collected from Little League baseball teams and youth basketball teams, these studies primarily focused on athletes' attitudes toward the coach, attraction to the team and sport, and self-esteem in relation to observed and perceived coach behaviors (Curtis et al., 1979; Smith et al., 1983; Smith & Smoll, 1978, 1990; Smoll et al., 1978). In terms of player attitudes, athletes tended to evaluate their coaches, teammates, and sport more positively when their coaches used more technical instruction, reinforcement, and mistake-contingent encouragement (Smith et al., 1983; Smith & Smoll, 1978, 1990; Smoll et al., 1978). Moreover, Smith and Smoll (1978) found that at the end of the season, youth baseball players reported higher self-esteem when their coaches used more reinforcement and mistake-contingent encouragement. On the other hand, players did not respond as positively to coaches who used punishment, general encouragement, or general communication (Curtis et al., 1979; Smith et al., 1983; Smith & Smoll, 1978).

While observation studies provide a better understanding of how coach behaviors relate to athletes' psychological outcomes, they also serve as the foundation for informing the content of coach interventions. Smith and colleagues (1979) developed the Coach Effectiveness Training (CET) intervention, which helps coaches create more positive environments for youth athletes based on the findings from previous observation studies. Subsequent research has shown that coaches who receive this intervention are better liked and evaluated as better teachers by players, and their players report more enjoyment and more attraction to the team (Barnett et al., 1992; Smith et al., 1979). These interventions have also resulted in higher athlete self-esteem and higher athlete retention (Barnett et al., 1992; Smith et al., 1979; Smoll et al., 1993). This body of

research provides evidence in favor of the continued use of observation studies, as this type of research contributes not only to the understanding of coach behaviors, but to the advancement of coach interventions and the positive sport experience.

In more recent years, observation systems have been developed that target other coach behaviors, like motivational climate orientations and autonomy support. Yet, all these observation systems had been focused on specific types of behaviors, rather than capturing coach behaviors more holistically. In 2015, Erickson and Côté developed the Assessment of Coaching Tone (ACT), a coach observation tool designed to assess the intervention tone coaches use when addressing athletes. Intervention tone refers to the "psychological meaning conveyed by a given coach interactive behavior" (Erickson & Côté, 2015, p. 700). Specifically, the ACT assesses the degree to which a given coach behavior, such as technical instruction, is also autonomy-supportive and mastery-oriented. This system is ideal for studying coach behaviors in relation to efficacy because it includes coach behaviors that are key efficacy sources. And while motivational climate and autonomy support are modifier dimensions, they can be treated as standalone variables when analyzing data (e.g., comparing the proportional usage of mastery-oriented behaviors between successful and less successful coaches; see Erickson & Côté, 2015, p. 712). The ACT can help improve interventions and coach education programs as well, making them more holistic with its range of behavior categories.

Over the nearly 50 years that observation methodology has been used in sport psychology research, studies have established that observed coach behaviors are associated with, and can even predict, various psychological outcomes in athletes. The literature has also demonstrated relationships between athletes' perceptions of coaches and the athletes' efficacy beliefs. Even with the development of observation systems that so closely connect to efficacy, research has yet

to look at how observed coach behaviors relate to athletes' efficacy beliefs. Therefore, the purpose of this study was to systematically observe coaches and explore how their behaviors (i.e., training and instruction, positive and negative feedback, degree of autonomy support, and motivational climate) predict their athletes' self-efficacy, other-efficacy, collective efficacy, and relation-inferred self-efficacy (RISE) beliefs. Specifically, it was hypothesized that 1) training and instruction, positive feedback, autonomy support, and mastery-oriented behaviors will positively predict athletes' efficacy beliefs; and 2) negative feedback, controlling, and ego-oriented behaviors will negatively predict athletes' efficacy beliefs.

CHAPTER III: METHODS

Participants

This study's sample included collegiate coaches and athletes from NCAA (National Collegiate Athletic Association) institutions within the Southeastern United States. To determine the required sample size to test the hypotheses, an a priori power analysis was conducted using G*Power 3.1 (Faul et al., 2009). Significance was set at $\alpha = .05$ and power at 80%, and the threshold for a medium effect size ($f^2 = .15$) was used based on previous findings from the efficacy literature indicating medium effects (Wright et al., 2016). To detect a medium effect ($f^2 = .15$), the minimum required sample size for multiple linear regression is 109 participants. In order to achieve this sample size, 12 teams were recruited (12 coaches, approximately 260 athletes) so that even with 50% athlete participation by each team, the sample would include about 130 participants, leaving room for further issues such as participant dropout.

Procedures

All study procedures were approved by all institutions (see Appendix A for study approval letter). Twelve NCAA coaches were then contacted individually via IRB-approved recruitment emails, which briefly explained the research and asked whether the coach and his/her team would be willing to participate. Four coaches did not respond and two coaches declined participation.

Data collection was scheduled for the six teams that agreed to participate. All data were collected during the months of February, March, and April, so the soccer and football teams were in offseason training periods. The lacrosse team's season started the following weekend, but the team had played an exhibition game the weekend prior. The procedures for each observation were carried out by the primary researcher and/or members of the research team. Before practice,

a video camera was positioned by the practice area and a member of the research team met with the observed coach to equip the audio recording device. Coaches were instructed to behave as they would in a normal practice, with no restrictions on what they were allowed to say; to refrain from muting, turning off, or manipulating the recording in any way; and that they could stop participation at any point if they so decided. During practice, a member of the research team actively operated a video camera to keep the coach and relevant practice activities in the shot. Another researcher kept general notes about the practice to aid in behavioral coding later.

After practice concluded, a researcher retrieved the audio recorder from the coach, thanked him for his time, and offered the option to receive personalized feedback from the behavioral coding (not including any player data). Athletes were then asked to meet in a pre-decided location (e.g., locker room, practice facility), where they were given instructions and a QR code to complete the online Qualtrics survey on their personal smartphones. Coaches were asked not to be present during the survey. Researchers remained present while athletes took the surveys to answer any questions, and any athletes who asked about the research were debriefed, so long as they had completed the survey.

Audio and video recordings were then uploaded to a secure folder and deleted from the recording devices. Recordings were transcribed into separate Microsoft Excel documents (one for each team), with behaviors separated by row. Each row contained the time of the behavior from the recording, the behavior (i.e., statement), ID code (i.e., the ID of the athlete or group to which the behavior was directed), and the ACT code.

As the design of the research necessitates identification of the athletes to link survey responses to coach behaviors, all athletes, groups, and teams were assigned four-digit ID numbers. Each behavior received one of three types of ID codes, which specified whether the

behavior was directed at the whole team, a group, or a specific athlete. A secure file contained each team's roster where ID numbers were linked to the corresponding athletes' first and last names, any nicknames, positions, jersey numbers, and any other information that aided in identifying the athlete during coding. The file also included relevant groups (e.g., position groups, offense and defense, jersey colors) and their four-digit IDs. The first digit of ID codes represented the teams, the second digit represented a group (except for 0, which indicated an individual athlete), and the final two digits were random and represented individual athletes. Behaviors directed at a whole team were identified by the team digit followed by 3 zeroes (e.g., 1000, 2000, or 3000). An example athlete code was 2012, where 2 = soccer team, 0 = individual athlete, and 12 = the specific athlete. An example group code was 1500, where 1 = lacrosse team, and 5 = all those wearing white jerseys.

Materials

Behavioral Observation

Coaches' verbal behaviors were recorded using a SONY ICD-PX470 digital voice recorder with a lapel microphone attachment clipped to the coaches' shirt collars. Video recordings were collected using a Melcam Digital HD video camera recorder, which was mounted on a tripod and actively operated by a research assistant throughout practice sessions to capture coach behaviors and coach-athlete interactions, as well as provide context for coding.

Coach behaviors were systematically encoded using the Assessment of Coaching Tone (ACT) observational coding system, which was designed to quantify coaches' underlying intervention tones (Erickson & Côté, 2015). The ACT is a valid and reliable system, with initial inter- and intra-rater reliability tests resulting in 76%–89% agreement (Erickson & Côté, 2015). According to the ACT, coach behaviors are quantified using a two or three-digit sequence of

nominal codes, beginning with a content dimension (i.e., behavior category) and followed by one or two modifier dimensions*: autonomy support*, *evaluation climate*, and *rapport*. The content dimension provides the context behavior and contains nine categories (see Figure 1).

For clarity and consistency purposes, there are some semantic issues to address regarding content codes 2, 3, and 4. The ACT defines instruction/feedback as "technical and/or tactical and/or teaching instruction or feedback from coach, directed at athlete(s) motor performance or skill execution," whereas positive evaluation/encouragement and negative evaluation are limited to non-technical responses (e.g., "good shot" or "that was terrible") to athlete(s) performance or skill execution (Erickson & Côté, 2015, p. 708). Thus, any feedback in the form of technical instruction (e.g., "you didn't follow through on that shot") is coded as instruction/feedback. To maintain clarity in the terminology of the current study, ACT code instruction/feedback will be referred to as training/instruction, although it will still be coded according to the ACT guidelines. Removing the term feedback from this label is more consistent with Smith et al.'s (1977) *mistake-contingent technical instruction* category in the CBAS and helps to differentiate this category from positive and negative (evaluative) feedback. ACT codes *positive evaluation/encouragement* and *negative evaluation* will be referred to as *positive feedback* and *negative feedback*.

Figure 1

ACT behavior codes.

Content	Autonomy Support	Evaluation Climate	Rapport
1 - Organization	1 - Autonomy-supportive 2 - Neutral 3 - Controlling		
2 -Instruction/Feedback	1 - Autonomy-supportive 2 - Neutral 3 - Controlling	4 – Mastery-oriented 5 – Neutral 6 – Ego-oriented	
3 - Positive Evaluation/Encouragement	1 - Autonomy-supportive 2 - Neutral 3 - Controlling	4 – Mastery-oriented 5 – Neutral 6 – Ego-oriented	
4 - Negative Evaluation	1 - Autonomy-supportive 2 - Neutral 3 - Controlling	4 – Mastery-oriented 5 – Neutral 6 – Ego-oriented	
5 - Mental Skills	1 - Autonomy-supportive 2 - Neutral 3 - Controlling	4 – Mastery-oriented 5 – Neutral 6 – Ego-oriented	
6 - Social/Moral Behavior	1 - Autonomy-supportive 2 - Neutral 3 - Controlling	4 – Mastery-oriented 5 – Neutral 6 – Ego-oriented	
7 - Non-sport Communication			7 – Personal 8 – General
8 - Observation			
9 - Not Engaged			
x - Uncodable			

Note. Observation, Not Engaged, and Uncodable were not used in the coding process for this study. From "The intervention tone of coaches' behaviour: Development of the Assessment of Coaching Tone (ACT) observational coding system," by K. Erickson and J. Côté, 2015, *International Journal of Sports Science & Coaching, 10*(4), 699–716. Copyright 2015 by the International Journal of Sports Science & Coaching.

The three modifier dimensions allow for the assessment of autonomy support, evaluation climate (i.e., motivational climate), and rapport from the coach. The *autonomy support* dimension is a modifier for content codes 1–6 and is coded as either 1) *autonomy-supportive*, 2) *neutral*, or 3) *controlling*. The *evaluation climate* dimension is a modifier for content codes 2–6 and is coded as either 1) *mastery-oriented*, 2) *neutral*, or 3) *ego-oriented*. Finally, the *rapport* dimension is a modifier for *non-sport communication* and is coded as either 1) *personal* (i.e., communication directly referencing personal information about an athlete) or 2) *general* (i.e., communication that does not reference any personal information about the athlete). There are no modifiers for behaviors coded as *observation* or *not engaged*.

The ACT was designed to allow for continuous coding of behaviors and durations, such that every second can be accounted for—even when a coach is not actively engaged with athletes—using content codes *observation*, *not engaged*, and *uncodable*. Since the focus of the current study was on verbal behaviors directed toward athletes, and the coding was not continuous, *observation*, *not engaged*, and *uncodable* were not used. All other codes were used during coding. However, behaviors coded as *non-sport communication* were removed, as this code was not relevant to the hypotheses and only had one modifier, *rapport*, which also was not relevant as it was not related to sport. Although content codes *organization*, *mental skills*, and *social/moral behavior* were not related to the hypotheses, they all include at least one of the two relevant modifier dimensions (i.e., autonomy support and motivational climate), and were therefore retained in coding.

Coder Training and Reliability

Coder training was completed according to the six-stage protocol outlined in Erickson and Côté (2015) and using the Assessment of Coaching Tone coding system manual provided by

the authors. Stage 1 was an introductory discussion of systematic observation research, in which the researcher presented the coder with the ACT coding manual and explained in detail the overall purpose of the ACT and each of its categories. In Stage 2, coders were given a copy of the manual to study for several days to familiarize themselves with the categories. Stage 3 involved a pencil and paper test requiring coders to classify hypothetical coaching statements using the coding system, serving as an initial check of understanding and to identify potential teaching opportunities. The test was a modified form of that used by Erickson and Côté (2015), which was provided upon request, and included the original sixteen statements, as well as four added statements from pilot testing to total 20 statements. Stage 4 involved group-based verbal coding of a 15-minute segment of a videotaped coaching session found online, guided by the researcher, wherein the coder and the primary researcher discussed rationale behind their coding decisions. Stage 5 was another group-based coding session (using another 15-minute segment from the same online video) guided by the researcher with discussion of coding decisions, but coders took turns using the coding recording method. Finally, Stage 6 was an independent, full coding assignment of a new 10-minute videotaped coaching session found online. Codes in this stage were used to calculate agreement with the researcher, and disagreements were reviewed to improve understanding. This stage continued until the coder met the minimum 75% agreement (Erickson & Côté, 2015) with the researcher. The coder reached 76% agreement with the researcher, thereby completing the coder training.

Upon completion of all behavioral coding by the primary researcher, interrater reliability was calculated as a check of the coding system. The same undergraduate coder that received training coded approximately 10% of behaviors for each coach. This was a percentage of total behavior counts, rather than practice duration, to ensure similar proportions of behaviors coded

across practices. Erickson and Côté (2015) retested reliability in coders two months after initial coder training. As it had been over two months since the current coder's training, the coder was asked to code 10% of one team's practice to check training retention. The resulting percent agreement for full codes (i.e., all two or three digits of each behavior code) was 50%. Therefore, the coder was given an abbreviated training before interrater reliability was tested.

After one week of retraining, the coder was assigned 10% of each of the sampled teams' practices to code independently (another set of behaviors was selected from the previously coded practice). The minimum 75% agreement (Erickson & Côté, 2015) with the researcher was met by the coder for full code sequences of the three practices, indicating sufficient inter-rater reliability (range = 79%–87%).

Athlete Survey

Demographics. Participants were asked to report both general (age, academic year, race, and ethnicity) and sport-relevant demographic information. They were asked for either their name or three unique features that would link their survey responses to any coach behaviors directed at them during the observation; participants were informed that their names (or features) would be replaced with ID codes to protect confidentiality. Sport-related demographic questions included sport, role on the team (e.g., starter, non-starter, injured), years on the team, position in the sport, and whether they had a Name, Image, and Likeness (NIL) deal. Additionally, each participant was asked to rate the statement, "my coach's behavior today was consistent with typical practices," on a 5-point Likert scale, ranging from 1 (*Not true at all*) to 5 (*Completely true*) and to provide any relevant comments. The demographics portion of the survey was placed at the end as it would not be as affected by fatigue. See Appendix B for the list of demographic questions.

Self-Efficacy. Athletes' self-efficacy perceptions were measured using a scale developed and used for a study by Jackson et al. (2011). The scale was developed to measure athletes' perceptions of self-efficacy using the stem, "at this point in time, rate your confidence in your ability to…" followed by 14 items (e.g., "perform all the difficult technical aspects of your sport"). The internal consistency score for this measure was $\alpha = .86$ (Jackson et al., 2011). Each item is answered on a 5-point Likert scale from 1 (*no confidence at all*) to 5 (*complete confidence*). In line with Jackson et al.'s (2011) procedures, a single mean score was computed for the 14 items. Cronbach's alpha for this measure in the current sample was $\alpha = .88$. A full list of items from the self-efficacy measure can be found in Appendix C.

Other-Efficacy. Athletes' perceptions of other-efficacy (regarding their coaches' abilities) were measured using a modified form of the Coaching Efficacy Scale (CES; Feltz et al., 1999). The CES is a 24-item measure developed to assess coaches' perceptions of their own coaching-related abilities. For the purposes of this study, the CES was modified in a manner consistent with prior research on athlete perceptions of coach efficacy (Jackson & Beauchamp, 2010; Kavussanu et al., 2008; Short & Short, 2004). Specifically, the stem sentence ("how confident are you in your ability to…") was changed to "how confident are you in your coach's ability to…" to assess the athletes' perceptions of their coaches' abilities.

The items were the same as the original, with slight changes in wording to fit the stem. The modified version included the same four subscales as the original version. These include the following: *game strategy* (seven items, e.g., "adapt to different game/meet situations?"); *motivation* (seven items, e.g., "motivate his/her athletes?"); *technique* (six items, e.g., "teach the skills of his/her sport?"); and *character building* (four items, e.g., "promote good sportsmanship?"). In previous research, Cronbach's alpha scores for the subscales were $\alpha = .87$,

α = .90, α = .88, and α = .89, respectively, and α = .93 for the whole scale (Feltz et al., 1999). While the original CES used a 10-point Likert scale, the modified version in this study used a 4-point Likert scale ranging from 1 (*not very confident*) to 4 (*completely confident*), consistent with recommendations based on reliability testing of the original rating scale (Myers et al., 2005). CES scores are calculated as an average of all items. In the current sample, this measure showed good internal consistency (α = .95). For a complete list of other-efficacy scale items, see Appendix D.

Collective Efficacy. Athletes' perceptions of their teams' collective efficacy were measured using the Collective Efficacy Questionnaire for Sports (CEQS; Short et al., 2005). The CEQS, developed to assess athletes' perceptions of collective efficacy, is a valid and reliable scale that has been used in previous studies on collective efficacy in sport settings (e.g., Atkinson et al., 2018; Hampson & Jowett, 2014). The 20-item questionnaire asks athletes to "rate your team's confidence, in terms of the upcoming game or competition, that your team has the ability to…" on an 11-point Likert scale ranging from 0 (*not at all confident*) to 10 (*extremely confident*). The scale is made up of five subscales: *ability* (four items, e.g., "outplay the opposing team"); *effort* (four items, e.g., "demonstrate a strong work ethic"); *persistence* (four items, e.g., "perform under pressure"); *preparation* (four items, e.g., "mentally prepare for this competition"); and *unity* (four items, e.g., "maintain effective communication"). Collective efficacy scores were calculated as the average of all items, as the current study was focused on total collective efficacy and not the specific subscales.

Previous research has shown the scores produced by the CEQS to be internally reliable, with a sufficient Cronbach's alpha (α = .97) for the total score in a sample of college-aged

student-athletes (Short et al., 2005). Cronbach's alpha in the current sample was α = .97. The full list of CEQS items can be found in Appendix E.

Relation-Inferred Self-Efficacy (RISE). Athletes' RISE beliefs were measured in a manner consistent with Jackson et al. (2011), using the same 14 items and 5-point Likert scale as the self-efficacy measure. The stem sentence used for this scale was, "at this point in time, estimate how confident your coach is in your ability to…." This measure demonstrated adequate internal consistency (α = .87) in previous research (Jackson et al., 2011), as well as in the current study (α = .94). As with the self-efficacy scale, a single mean score was calculated from the 14 items. The full scale can be found in Appendix F.

Statistical Analyses

All statistical analyses were conducted using RStudio (version 2023.6.0.421). Descriptive statistics were used to determine frequencies, means, standard deviations, and ranges for the demographic and primary outcome variables of the sample. Intraclass correlation coefficients (ICC) were calculated to determine whether a clustering effect was present; that is, whether data within teams (i.e., clusters) are more similar compared to the data within the others. Should clustering effects be observed, there would be evidence in favor of using hierarchical modeling, rather than linear modelling (Huang, 2016). Pearson product-moment correlations were calculated to assess the bivariate relationships among study variables.

A series of eight multiple regression analyses were conducted to test the hypotheses relating to specific coach behaviors as predictors of athletes' self-efficacy, other-efficacy, collective efficacy, and relation-inferred self-efficacy (RISE) beliefs. Each efficacy type was entered as the outcome variable of two separate regression models to test the two hypotheses. The four models used to test the first hypothesis included training/instruction, positive feedback,

autonomy supportive behaviors, and mastery-oriented behaviors as predictors. The four models used to test the second hypothesis included negative feedback, controlling behaviors, and ego-oriented behaviors as predictors.

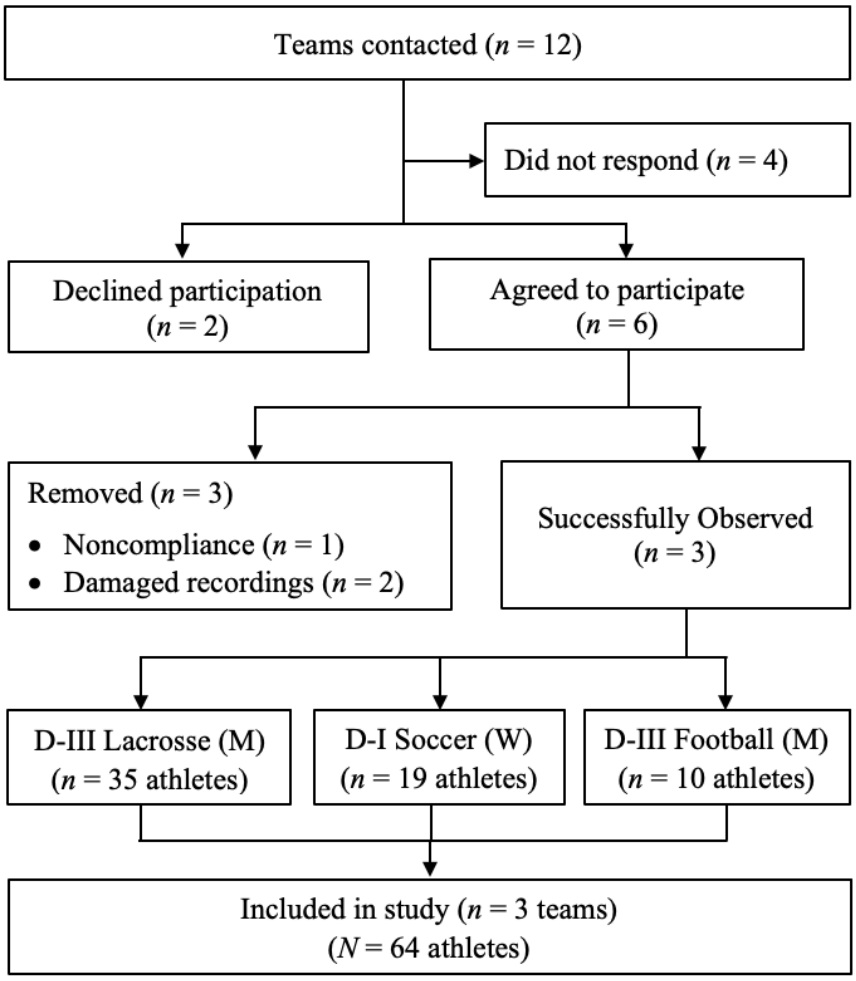
CHAPTER IV: RESULTS

Sample Characteristics

Twelve coaches were contacted during recruitment and six agreed to participate. Data were collected from all six teams, but only three were included in the final sample after the other three were removed. Figure 2 displays the flow of participants through the recruitment process.

Figure 2

Flow of teams during recruitment.



A total of 66 athletes completed surveys. One lacrosse player's survey was removed as he did not provide enough information to link his survey to coach behaviors. One soccer player's survey was removed as she was not at practice the day of data collection. The final sample consisted of three coaches, and male and female athletes ($N = 64$) from NCAA Division I and III sports. All three coaches were males; the lacrosse and soccer coaches were head coaches, and the football coach was a position coach for two position groups. The sports represented included Division I Women's Soccer ($n = 19$), Division III Men's Lacrosse ($n = 35$), and Division III Football ($n = 10$). Athletes in this sample were males ($n = 45$) and females ($n = 19$) between the ages 18 and 23 ($M = 19.95$, $SD = 1.28$), and reported an average of 2.22 ($SD = 1.13$) years of experience on their respective teams.

The sample was distributed between Freshmen (28%), Sophomores (28%), and Juniors (30%), with the remaining 14% being Seniors. In terms of their role on the team, 25% of the athletes were starters and 6% were injured (all soccer players). The remaining athletes identified as alternating starters (14%), non-starters (48%), and replacements (3%). A vast majority of participants identified as White (83%), with most others identifying as Black/African-American (11%). One participant identified as other, and one identified as multiple (one preferred not to say and one did not respond). The sample's ethnicities included Hispanic/Latinx (9%) and Not Hispanic/Latinx (64%), others preferred not to say (11%) or did not respond (16%).

Most of the sample reported not having a current Name, Image, and Likeness (NIL) deal (86%). Aside from one lacrosse player who did not respond, the remaining 13% reported that they did have a current NIL deal. This means these athletes are receiving financial compensation from entities outside of the NCAA for their name, image, and likeness as student-athletes (e.g., marketing and promotional campaigns, autographs, brand endorsements, etc.). The NCAA only

recently passed the rule allowing student-athletes to be compensated through NIL, a rule which will surely demand attention in sport psychology research going forward.

Tables 1 and 2 display demographic breakdowns of the three teams. Some descriptive demographic differences were observed. Regarding academic year, the lacrosse and soccer teams were distributed between academic years, while half of the football team were freshmen and none of the players were seniors (see Table 1). Interestingly, the only sampled athletes who reported being injured were on the soccer team. There were some descriptive differences in reported race and ethnicity as well. The football team was evenly split between Black/African American and White. The soccer team was majority White and had players who identified as other races. On the lacrosse team, aside from one player who did not respond and one who preferred not to say, the entire team identified as White (see Table 2).

Table 1

Demographic makeup of teams.

Variable	Lacrosse		Soccer		Football	
	M	*SD*	*M*	*SD*	*M*	*SD*
Age	20.20	1.35	19.84	1.21	19.30	0.95
Years on Team	2.29	1.15	2.37	1.21	1.70	0.82
	n	%	*n*	%	*n*	%
Academic Year						
Freshman	8	23	5	26	5	50
Sophomore	10	29	5	26	3	30
Junior	11	31	6	32	2	20
Senior	6	17	3	16	0	0
Role						
Starter	7	20	7	37	2	20
Alternating starter	7	20	1	5	1	10
Non-starter	19	54	5	26	7	70
Replacement	1	3	1	5	0	0
Injured	0	0	4	21	0	0
Did not respond	1	3	1	5	0	0
Current NIL Deal?						
Yes	3	9	4	21	1	10
No	31	89	15	79	9	90
Did not respond	1	3	0	0	0	0

Table 2

Race and ethnicity of teams.

Variable	Lacrosse		Soccer		Football	
	n	%	*n*	%	*n*	%
Race						
Black/African American	0	0	2	11	5	50
White	33	94	15	79	5	50
Other	0	0	1	5	0	0
Multiple	0	0	1	5	0	0
Prefer not to say	1	3	0	0	0	0
Did not respond	1	3	0	0	0	0
Ethnicity						
Hispanic/Latinx	4	11	2	11	0	0
Not Hispanic/Latinx	18	51	16	84	7	70
Prefer not to say	6	17	1	5	3	30
Did not respond	7	20	0	0	0	0

Preliminary Analyses

Based on the ICC, there was no evidence of team-level clustering effects for any of the variables (self-efficacy, ICC = .10; other-efficacy, ICC = .04; collective efficacy, ICC = .18; RISE, ICC = .06). Therefore, the ICC provide evidence in support of using linear modelling rather than hierarchical modelling.

Table 3 displays Pearson correlations of all study variables, in which coach behaviors were calculated as the total of behaviors directed at individuals, subgroups within a team, and teams. When coach behaviors were combined across individuals, subgroups, and teams, there were extremely high correlations observed between behaviors (r = .82–.99, p < .01). After

calculating Pearson correlations with coach behaviors separated between those directed at individual athletes and those directed at subgroups and teams, a reduction in magnitude was observed in the correlations between coach behaviors directed at individual athletes (see Table 4). Therefore, it was determined that only behaviors directed at individual athletes would be included in the main analyses.

Correlations

As was expected, all four efficacy beliefs were significantly and positively correlated with one another (r = .53–.71, p < .01), and these correlations were all strong (Table 3). This indicates that athletes high in one efficacy belief were also high in all other efficacy beliefs. Most correlations between combined coach behaviors and efficacy beliefs were not significant. Those that were significant were negative and weak to moderate in strength. Training/instruction was negatively associated with collective efficacy (r = −.28, p < .05); autonomy-supportive behaviors were negatively associated with collective efficacy (r = −.31, p < .05); and ego-oriented behaviors were negatively associated with collective efficacy (r = −.33, p < .01).

Looking at the relationships among combined coach behaviors in Table 3, there are patterns in coaches' use of training/instruction and positive and negative feedback. There was a significant and positive correlation between positive and negative feedback (r = .82, p < .01), suggesting coaches who gave a lot of positive feedback also gave more negative feedback. However, coaches who used more training/instruction used less positive (r = −.69, p < .01) and negative feedback (r = −.75, p < .01). Interestingly, coaches who used more training/instruction were more mastery-oriented (r = .49, p < .01), whereas the use of positive and negative feedback were not associated with being more mastery-oriented (Table 3). All these relationships were still

present and similar in direction when the behaviors were directed only at subgroups and teams, though they changed slightly in strength (Table 5).

In the relationships among behaviors directed only at individual athletes (Table 4), there were some differences observed when compared to group-directed and combined behaviors. First, individual-directed behaviors were all positively correlated, meaning if athletes received one kind of behavior, they received the other behaviors as well. Second, coaches who gave more training/instruction to individual athletes also gave more positive ($r = .78$, $p < .01$) and negative feedback ($r = .39$, $p < .01$) to individual athletes. Finally, coaches who gave more positive and negative feedback to individuals were more mastery-oriented (see Table 4). Overall, these coaches differed in their behaviors directed at individuals and at subgroup and teams.

Table 3

Pearson correlations of efficacy variables and combined coach behaviors.

Variable	1	2	3	4	5	6	7	8	9	10
1. Self-efficacy	—									
2. Other-efficacy	.64**	—								
3. Collective efficacy	.64**	.65**	—							
4. RISE	.71**	.64**	.53**	—						
5. Training/instruction	-.10	.07	-.28*	-.05	—					
6. Positive feedback	-.01	-.09	.17	-.01	-.69**	—				
7. Negative feedback	-.10	-.15	.07	-.09	-.75**	.82**	—			
8. Autonomy support	-.13	.04	-.31*	-.08	.99**	-.69**	-.73**	—		
9. Controlling	-.09	-.11	.09	-.04	-.62**	.86**	.92**	-.63**	—	
10. Mastery-oriented	-.19	.01	-.20	-.05	.49**	.14	.11	.46**	.36**	—
11. Ego-oriented	-.15	.00	-.33**	-.12	.95**	-.60**	-.63**	.97**	-.57**	.45**

Note. Coach behaviors are totals of those directed at individuals, groups, and teams.

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Table 4

Pearson correlations of coach behaviors directed at individual athletes.

Variable	1	2	3	4	5	6
1. Training/instruction (I)	—					
2. Positive feedback (I)	.78**	—				
3. Negative feedback (I)	.39**	.32*	—			
4. Autonomy supportive (I)	.80**	.73**	.12	—		
5. Controlling (I)	.85**	.69**	.51**	.60**	—	
6. Mastery-oriented (I)	.83**	.73**	.61**	.57**	.86**	—
7. Ego-oriented (I)	.48**	.58**	.18	.54**	.39**	.28*

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Table 5

Pearson correlations of coach behaviors directed at subgroups and teams.

Variable	1	2	3	4	5	6
1. Training/instruction (G)	—					
2. Positive feedback (G)	-.81**	—				
3. Negative feedback (G)	-.74**	.97**	—			
4. Autonomy supportive (G)	1.00**	-.81**	-.72**	—		
5. Controlling (G)	-.63**	.93**	.97**	-.63**	—	
6. Mastery-oriented (G)	.49**	.05	.15	.47**	.34**	—
7. Ego-oriented (G)	.96**	-.77**	-.67**	.98**	-.61**	.42**

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Descriptive Results

Athlete Efficacy Beliefs

Before conducting the main analyses, the athlete survey data (i.e., efficacy scores) were visually examined and tested for differences between teams. Overall, athletes reported moderate to high levels of self-efficacy, other-efficacy, collective efficacy, and RISE beliefs. Sample means, standard deviations, skewness, kurtosis, and internal consistency scores for all outcome variables are displayed in Table 6.

Table 6

Sample descriptives and internal consistency for survey measures.

Variable	Mean (SD)	Skewness	Kurtosis	Cronbach's α
Self-Efficacy	4.08 (0.55)	-0.24	-0.62	.88
Other-Efficacy	3.46 (0.49)	-0.79	-0.28	.95
Collective Efficacy	7.46 (1.49)	-0.01	-0.64	.97
RISE	4.10 (0.65)	-0.49	-0.47	.94

To determine whether there were differences in efficacy beliefs between the teams, four one-way ANOVAs were conducted with team as the independent variable and self-efficacy, other-efficacy, collective efficacy, and RISE as outcome variables. All four models passed Levene's Test for homogeneity of variance, suggesting equal variances across the three teams, and thus, the assumption was not violated. Results indicated that there was a significant effect of team on self-efficacy scores, $F(2, 61) = 3.39$, $p = .04$, $\eta^2 = .10$, 95% CI [0.01, 0.27]. Post hoc comparisons using Tukey's HSD test revealed that athletes in the football team ($M = 4.48$, $SD = 0.60$) reported significantly higher self-efficacy than the athletes in the soccer team ($M = 3.98$,

SD = 0.53, *p* = .048). However, athletes in the lacrosse team (*M* = 4.02, *SD* = 0.51) did not significantly differ in reported self-efficacy from athletes in the football and soccer teams (see Table 7).

There was also a significant effect for team on collective efficacy scores, $F(2, 61) = 6.86$, $p = .002$, $\eta^2 = .18$, 95% CI [0.08, 0.39]. Tukey's HSD indicated that athletes on the football team (*M* = 8.70, *SD* = 1.40) reported significantly higher collective efficacy than athletes on both the soccer team (*M* = 6.72, *SD* = 1.01, *p* = .001) and lacrosse team (*M* = 7.50, *SD* = 1.52, *p* = .046); however, the soccer team did not differ from the lacrosse team (see Table 7). Overall, the football team reported the highest efficacy beliefs across all forms of efficacy, and was significantly higher in self-efficacy and collective efficacy.

Table 7

Descriptives and ANOVA results for efficacy variables by team.

Variable	Lacrosse		Soccer		Football		$F(2, 61)$	p	η^2
	M	*SD*	*M*	*SD*	*M*	*SD*			
Self-Efficacy	4.02_{ab}	0.51	3.98_{b}	0.53	4.48_{a}	0.60	3.39	.040	.10
Other-Efficacy	3.38	0.48	3.48	0.47	3.66	0.55	1.26	.291	.04
Collective Efficacy	7.50_{b}	1.52	6.72_{b}	1.01	8.70_{a}	1.40	6.86	.002	.18
RISE	4.05	0.65	4.01	0.61	4.48	0.71	2.04	.139	.06

Note. Means with different subscripts differ at *p* = .05 (self-efficacy) and *p* = .01 (collective efficacy) by Tukey's HSD test.

There was a non-significant effect of team on other-efficacy scores, $F(2, 61) = 1.26$, $p = .29$, 95% CI [0.00, 0.15], indicating that the three teams did not differ in their confidence in their coaches. Similarly, there was a non-significant effect of team on RISE scores, $F(2, 61) = 2.04$, *p*

= .14, 95% CI [0.00, 0.20], suggesting that the teams did not differ in how they perceived their coaches' confidence in them.

Coach Comparisons

A total of 1,293 behaviors were coded across all coaches, with 1,229 remaining after the removal of those coded as non-sport communication. Overall, athletes reported high agreement that their coaches behaved consistently with typical practices ($M = 4.56$, $SD = 0.73$). Most athletes rated their coaches' behavior consistency as 4 and 5. One lacrosse player reported a 1 with the comment, "did not talk enough," and one lacrosse player reported a 3 ("got on us a little more than usual"). Two soccer players reported 3s, but only one of them commented ("wasn't as vocal"). Therefore, the coaches' behaviors were considered to be representative of how they typically behave, thus the data was reliable. Coach behavior data from the ACT were then visually inspected for any trends. Interestingly, the coaches all used very little amounts of negative feedback and were all more mastery-oriented than ego-oriented. Table 8 displays the percentages of each coach's behaviors, broken down by the behavior's target (whether directed at individuals, groups, or the team) and by ACT dimensions. Because the motivational climate dimension is not a modifier for *organization* behaviors, the total frequencies are lower than the totals for content and autonomy support.

Due to the nominal nature of the coach behavior data, a series of three chi-square tests of independence were conducted to determine if there were associations or relationships between coaches and their behaviors. Regarding behaviors from the content dimension, there was a statistically significant association between coaches and behaviors used, $\chi^2(10) = 68.33$, $p < .001$, $V = .17$. In other words, the frequencies of a given behavior differed between the lacrosse, soccer, and football coaches. The lacrosse coach used the smallest proportion of

training/instruction (17%) behaviors compared to the soccer (28%) and football (26%) coaches. Positive feedback accounted for 46% of the lacrosse coach's behaviors, whereas the same behavior accounted for 29% and 25% of the soccer and football coaches' behaviors, respectively. Moreover, the coaches all used little negative feedback, ranging between 1%–3% of their behaviors (see Table 8).

Similarly, there was a significant association between coach and autonomy support behaviors, $\chi^2(4) = 35.41$, $p < .001$, $V = .12$, as the coaches used autonomy supportive, neutral, and controlling behaviors in different amounts. Across all three coaches, between 53%–56% of their behaviors were considered neutral in terms of autonomy support. The soccer coach used similar amounts of autonomy supportive (22%) and controlling (23%) behaviors, but was the most autonomy supportive and the least controlling of the three coaches (see Table 8). The lacrosse coach was the least autonomy supportive (10%) and most controlling (37%). The football coach was more controlling (31%) than he was autonomy supportive (13%).

Finally, there was a significant association between coach and motivational climate behaviors, $\chi^2(4) = 19.32$, $p < .001$, $V = .12$, with the frequencies of mastery-oriented, neutral, and ego-oriented behaviors differing between the three coaches. As seen in Table 8, the lacrosse coach was the most mastery-oriented (53%) in his behaviors, followed by the football coach (45%) and soccer coach (37%). Overall, the coaches used low amounts of ego-oriented behaviors (lacrosse = 7%; soccer = 12%; football = 5%).

Table 8

Percentages of coach behaviors by team and target.

Behavior	Lacrosse				Soccer				Football			
	Ind.	Group	Team	Total	Ind.	Group	Team	Total	Ind.	Group	Team	Total
						Content						
Organization	8.7	3.9	18.3	30.9	10.5	2.9	27.4	40.8	22.0	22.7	2.4	47.1
Training/Instruction	6.9	3.3	7.2	17.4	11.7	0.0	16.3	28.0	14.4	11.2	0.7	26.3
Positive Feedback	34.2	2.4	9.3	45.9	26.4	0.6	2.5	29.5	16.5	6.9	1.2	24.6
Negative Feedback	0.6	0.3	2.1	3.0	1.3	0.0	0.2	1.5	0.5	0.2	0.2	1.0
Mental Skills	0.0	0.3	1.5	1.8	0.2	0.0	0.0	0.2	0.2	0.0	0.7	1.0
Social/Moral	0.0	0.0	0.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	50.5	10.2	39.3	**333**	50.0	3.6	46.4	**478**	53.6	41.1	5.3	**418**
						Autonomy Support						
Autonomy Supportive	4.5	1.5	3.9	9.9	7.3	0.8	13.8	22.0	8.1	3.8	0.7	12.7
Neutral	34.5	3.0	15.6	53.2	29.1	1.7	24.3	55.0	31.6	22.5	2.4	56.5
Controlling	11.4	5.7	19.8	36.9	13.6	1.0	8.4	23.0	13.9	14.8	2.2	30.9
Total	50.5	10.2	39.3	**333**	50.0	3.6	46.4	**478**	53.6	41.1	5.3	**418**
						Motivational Climate [a]						
Mastery-Oriented	30.0	7.0	15.7	52.6	20.4	0.4	15.8	36.6	25.3	16.7	2.7	44.8
Neutral	26.5	1.7	12.6	40.9	39.8	0.0	11.6	51.4	31.7	17.2	1.4	50.2
Ego-Oriented	3.9	0.4	2.2	6.5	6.3	0.7	4.9	12.0	2.7	0.9	1.4	5.0
Total	60.4	9.1	30.4	**230**	66.5	1.1	32.4	**284**	59.7	34.8	5.4	**221**

Note. Bold numbers indicate total frequencies of behaviors coded; all other numbers are percentages.

[a] Frequency totals are smaller for Motivational Climate as this dimension is not applied to behaviors coded as Organization.

Main Analyses

To test the study hypotheses, a series of eight linear multiple regression models were tested, with two models per outcome (efficacy), grouped by hypotheses. That is, behaviors hypothesized to positively predict efficacy were grouped in one model, and those hypothesized to negatively predict efficacy were in the other. Only behaviors directed at individual athletes were used in the analyses, based on the reduction of intensity observed in the correlations when behaviors directed at groups and teams were removed. All regression models passed the assumption checks, as there were no violations of homogeneity or normality.

Self-Efficacy

Two multiple regression models were tested with self-efficacy as the outcome variable and coach behaviors as predictors. Due to the significant effect of team on self-efficacy scores revealed in the ANOVA, team was included as a covariate in both self-efficacy regression models. The model with training and instruction, positive feedback, autonomy support, mastery-oriented behaviors, and team predicting self-efficacy was not significant, $R^2 = .11$, $F(6, 57) = 1.14$, $p = .350$. None of the coach behaviors were unique predictors of self-efficacy (see Table 9). In this model, about 11% of the variance in self-efficacy was explained by these behaviors.

The model with negative feedback, controlling behaviors, ego-oriented behaviors, and team predicting self-efficacy was not significant ($R^2 = .10$, $F(5, 58) = 1.32$, $p = .270$), and no behaviors were unique predictors of self-efficacy (see Table 9). Taken together, these two models suggest that the hypothesized coach behaviors do not predict athletes' self-efficacy beliefs in this sample.

Table 9

Multiple regression results for self-efficacy.

Variable	*B*	*SE*	β	*t*	*p*
		Model 1			
Training/Instruction	0.00	0.06	.00	0.01	.991
Positive Feedback	0.00	0.03	.04	0.17	.866
Autonomy Supportive	-0.02	0.05	-.11	-0.45	.655
Mastery-oriented	0.01	0.04	.07	0.27	.792
Soccer [a]	-0.03	0.19	-.06	-0.17	.863
Football [b]	0.48	0.25	.86	1.92	.060
		Model 2			
Negative Feedback	0.05	0.16	.05	0.33	.742
Controlling	0.00	0.02	-.04	-0.24	.814
Ego-oriented	-0.01	0.07	-.01	-0.09	.932
Soccer [a]	-0.03	0.16	-.06	-0.21	.838
Football [b]	0.48	0.21	.88	2.27	.027

[a] Lacrosse = 0, soccer = 1. [b] Lacrosse = 0, football = 1.

Other-Efficacy

The model with training and instruction, positive feedback, autonomy support, and mastery-oriented behaviors predicting other-efficacy was not significant, $R^2 = .03$, $F(4, 59) = 0.53$, $p = .716$. None of the coach behaviors uniquely predicted other-efficacy. The model with negative feedback, controlling behaviors, and ego-oriented behaviors predicting other-efficacy was not significant, $R^2 = .01$, $F(3, 60) = 0.23$, $p = .878$. None of the coach behaviors uniquely predicted other-efficacy. Table 10 shows the results of both other-efficacy models. Similar to the results from the self-efficacy models, the hypothesized coach behaviors did not predict athletes' other-efficacy beliefs about their coaches in this sample.

Table 10

Multiple regression results for other-efficacy.

Variable	*B*	*SE*	β	*t*	*p*
		Model 3			
Training/Instruction	0.04	0.05	.80	0.83	.413
Positive Feedback	0.00	0.02	.00	-0.01	.992
Autonomy Supportive	-0.04	0.05	-.20	-0.82	.418
Mastery-oriented	0.00	0.04	.03	0.10	.918
		Model 4			
Negative Feedback	-0.09	0.14	-.09	-0.63	.535
Controlling	0.01	0.02	.12	0.74	.463
Ego-oriented	-0.02	0.06	-.06	-0.40	.694

Collective Efficacy

Two multiple regression models were tested with collective efficacy as the outcome variable. Due to the significant effect of team on collective efficacy scores revealed in the ANOVA, team was included as a covariate in both collective efficacy regression models. Although the *t*-test revealed a significant difference in collective efficacy between divisions, division was not included as a covariate, as the number of teams was too small. The model with training and instruction, positive feedback, autonomy support, mastery-oriented behaviors, and team predicting collective efficacy was significant, $R^2 = .22$, $F(6, 57) = 2.75$, $p = .021$. The overall model explained about 22% of variance in collective efficacy scores. However, none of the behaviors predicted collective efficacy when all others were held constant.

The model with negative feedback, controlling behaviors, ego-oriented behaviors, and team predicting collective efficacy was significant, $R^2 = .20$, $F(5, 58) = 2.81$, $p = .024$. These behaviors together explain about 20% of the variance in athletes' collective efficacy. As with the

first model, no behaviors uniquely predicted collective efficacy. Results of both collective efficacy models are shown in Table 11.

Table 11

Multiple regression results for collective efficacy.

Variable	*B*	*SE*	β	*t*	*p*
Model 5					
Training/Instruction	-0.12	0.14	-.27	-0.81	.422
Positive Feedback	-0.03	0.07	-.09	-0.39	.697
Autonomy Supportive	0.06	0.13	.11	0.48	.635
Mastery-oriented	0.17	0.11	.39	1.51	.137
Soccer [a]	-0.64	0.48	-.43	-1.32	.193
Football [b]	1.26	0.62	.84	2.02	.049
Model 6					
Negative Feedback	0.22	0.40	.08	0.54	.591
Controlling	0.02	0.05	.05	0.31	.755
Ego-oriented	-0.03	0.17	-.03	-0.20	.842
Soccer [a]	-0.76	0.42	-.51	-1.83	.073
Football [b]	1.18	0.55	.79	2.15	.036

[a] Lacrosse = 0, soccer = 1. [b] Lacrosse = 0, football = 1.

Relation-Inferred Self-Efficacy (RISE)

Two multiple regression models were tested with RISE as the outcome variable. The model with training and instruction, positive feedback, autonomy support, and mastery-oriented behaviors predicting RISE was not significant, $R^2 = .06$, $F(4, 59) = 0.97$, $p = .428$. No behaviors were unique predictors of RISE, and the model explained only 6% of the variance in RISE beliefs (see Table 12). The model with negative feedback, controlling behaviors, and ego-oriented behaviors predicting RISE was not significant, $R^2 = .03$, $F(3, 60) = 0.66$, $p = .580$. None

of the variables significantly predicted RISE when all others were held constant (see Table 12). Both of these models explained a small amount of variance in relation-inferred self-efficacy.

Table 12

Multiple regression results for RISE.

Variable	*B*	*SE*	β	*t*	*p*
		Model 7			
Training/Instruction	0.07	0.06	.37	1.12	.267
Positive Feedback	-0.04	0.03	-.30	-1.33	.188
Autonomy Supportive	0.00	0.06	.01	0.04	.967
Mastery-oriented	0.01	0.05	.03	0.13	.894
		Model 8			
Negative Feedback	-0.21	0.18	-.17	-1.15	.253
Controlling	0.03	0.02	.20	1.26	.212
Ego-oriented	-0.02	0.08	-.03	-0.25	.805

CHAPTER V: DISCUSSION

The purpose of this study was to examine how observed coach behaviors influence athletes' efficacy beliefs. Theoretically, coaches' use of instruction, positive feedback, autonomy support, and mastery-oriented behaviors would lead to higher efficacy beliefs in athletes, whereas negative feedback, controlling behaviors, and ego-oriented behaviors would lead to lower efficacy beliefs in athletes. Therefore, the first hypothesis was that training and instruction, positive feedback, autonomy support, and mastery-oriented coach behaviors would be positively associated with athletes' self-efficacy, other-efficacy, collective efficacy, and RISE beliefs. This hypothesis was not supported, as the results indicated that none of the specified coach behaviors were associated with, nor were predictors of any efficacy variables. It was also hypothesized that negative feedback, controlling behaviors, and ego-oriented coach behaviors would be negatively associated with athletes' self-efficacy, other-efficacy, collective efficacy, and RISE beliefs. The results did not reveal any of the coach behaviors to be predictors of efficacy beliefs, therefore the second hypothesis was not supported. The findings of the current study will be discussed in more detail and in the context of their theoretical and applied implications.

Key Findings and Theoretical Implications

Although the hypotheses were not supported, the results have theoretical implications. In line with previous theory and research, all forms of efficacy beliefs were significantly and positively correlated with one another, as has been found consistently in prior studies (e.g., Jackson & Beauchamp, 2010; Jackson et al., 2011). This suggests that, in general, athletes who are confident in their abilities are also confident in their coach and their team, and even perceive their coach to be more confident in them. Efficacy literature has previously studied collective efficacy separately from the relational efficacy beliefs (i.e., self-efficacy, other-efficacy, and

RISE). While Lent and Lopez (2002) differentiated collective efficacy from their relational efficacy beliefs, the positive relationships found in this study could support collective efficacy being studied in tandem with relational efficacy in the future.

Overall, the findings of the main analyses did not support previous literature on coach behaviors as efficacy sources. None of the hypothesized coach behaviors were significant predictors of any of the efficacy beliefs. However, theoretical implications can be found in the lack of support for the research hypotheses. Most surprising were the correlations between training/instruction behaviors and efficacy beliefs. In this sample, training/instruction was not related to any of the relational efficacy beliefs (i.e., self-efficacy, other-efficacy, and RISE), regardless of whether the behavior was directed at individuals, groups, or both. These findings oppose those of previous studies which suggested training and instruction-related behaviors by coaches are related to athletes' self-efficacy and RISE beliefs (Habeeb, 2020; Vargas-Tonsing, 2009). Furthermore, except when directed only at individuals, training/instruction was found to be significantly and negatively correlated with collective efficacy, indicating that coaches who gave more instruction had teams with lower perceived team abilities. This was in contrast to previous research (e.g., Hampson & Jowett, 2014; Høigaard et al., 2015) that found significant positive correlations between training and instruction and collective efficacy.

Although none of the coach behaviors were found to be significant predictors of efficacy beliefs in this study, the current sample ($N = 64$) was not adequately powered. Even if effects were present, the sample was not large enough for them to be detected. Based on some of the beta weights in the main analyses, it is possible that there were effects, such as training/instruction predicting other-efficacy ($\beta = .80$), and mastery-oriented behaviors predicting collective efficacy ($\beta = .39$). Though these relationships were not significant, the beta weights

suggest that, with a larger sample, significant relationships might be found. Therefore, while it could be that there were no effects, more data would need to be collected before a confident conclusion is made.

Coaches' use of positive or negative performance feedback were not found to be related to any form of efficacy belief. According to Bandura (1997), performance feedback—a form of verbal persuasion—is a source of self-efficacy appraisals. This has been corroborated by other researchers with evidence that perceptions of positive feedback are positively related to self-efficacy (Forlenza et al., 2018; Saville et al., 2014; Schunk, 1995), as well as collective efficacy (Hampson & Jowett, 2014; Høigaard et al., 2015). Bandura (1997) stated that the extent to which evaluative feedback influences efficacy is determined by how it is framed. Specifically, feedback focused on effort has a lesser effect than feedback focused on personal abilities because it communicates to the person that they require more effort to accommodate for a lack of ability. Therefore, if the coaches' feedback in this sample was more often emphasizing players' efforts—rather than abilities—then that could explain why feedback did not predict players' efficacy beliefs.

The findings of the main analyses, that observed coach behaviors did not predict efficacy, may lend support to Bandura's theory of how self-efficacy is informed. Bandura (1986) suggested that efficacy information from the environment does not alone inform a person's self-efficacy beliefs, but that "it becomes instructive only through cognitive appraisal" (p. 401). In other words, a coach's behavior will not inherently inform an athlete's beliefs in his abilities, but the way in which the athlete processes the coach's behavior will. This study partially supports Bandura's framework, as coach behaviors alone were not predictors of athletes' efficacy beliefs. By adding measures of athlete perceptions to this research design, a future study could more

accurately assess the contribution of coach behaviors in the context of this process described by Bandura.

There are also implications in the descriptive results, especially when looking at the coach behavior and team efficacy comparisons together. First, the football coach directed a higher proportion of behaviors at individuals than did the other coaches; the football team also reported higher efficacy beliefs than the other teams. More specifically, the football coach was the only coach to give a higher proportion of training/instruction to individuals than to groups and the team, and his team reported significantly higher self-efficacy than the soccer team. With additional evidence, this could support training and instruction as a source of self-efficacy. Second, the coaches were all more mastery-oriented than ego-oriented, and their teams all reported moderate to high efficacy. Although motivational climate behaviors were not predictors of efficacy in this sample, future research should explore this further.

Applications

One of the driving intentions behind this study was to extend the athlete efficacy literature by utilizing coach behavior observation techniques, and thus open the door to a new line of research in sport psychology. In the nearly 50 years since Tharp and Gallimore (1976) first systematically observed coach behaviors, this methodology has been used in many sport studies that have advanced the understanding of coaches and how they influence athletes. Yet, to the author's knowledge, this technique has not been applied when examining the effects of coaches' behaviors on athlete efficacy beliefs. The present study will hopefully serve as a foundation and guide for the continued exploration of this relationship.

The Assessment of Coaching Tone (ACT) observational system has potential in coach intervention development as well. Unlike other coach observation methods, the ACT

incorporates a broad range of coach behaviors, from instruction and feedback to motivational climate and autonomy support. As such, using the ACT could extend interventions like Smith and Smoll's CET to include motivational climate and autonomy support, thereby creating a more holistic intervention.

This study has implications for those in applied settings as well, such as coaches and sport psychology professionals. All the teams in this sample reported moderate to high efficacy beliefs despite the coaches generally using behaviors differently, suggesting that there is some flexibility in coaching. This could alleviate some of the pressure coaches might feel to model a specific coaching style. There were also patterns of behavior usage observed across all three coaches. Specifically, the coaches used little amounts of negative feedback (not including instructive feedback) and were far more mastery-oriented than ego-oriented. Considering these teams had moderate to high efficacy beliefs, sport psychology consultants could use these behavior patterns to inform their work with coaches. For example, if a team is showing signs of low confidence, a practitioner might focus on the motivational climate the coach is building.

Strengths and Limitations

Some limitations of the study should be noted. First, only six of the twelve recruited coaches agreed to participate. Of the other half, four coaches did not respond to the recruitment emails and two coaches declined participation, communicating concerns over confidentiality and beliefs that confidence-related research might negatively impact their players' confidence. For example, one coach stated that his team had performed poorly in a recent tournament and did not want any "outside noise" as the team's confidence was already low. It is possible that other coaches did not participate because they believed their teams' confidence to be low, leaving a sample of teams who were already confident.

Furthermore, three of the coaches who agreed to participate and were observed were not included in the final sample. D-III men's track was removed due to the coach's frequent noncompliance to instructions, which was discovered during the coding process. The recording files from the D-III men's basketball and men's soccer practices were damaged and could not be recovered for coding. Unfortunately, the basketball team's season ended before a second observation could be scheduled. Although the soccer team was rescheduled for a second observation, no soccer players participated in the survey the second time. Taken together, there are many difficulties faced when attempting coach research (e.g., trust, communication, interest), highlighted by the fact that only 25% of the recruited coaches were in the final sample. For this study specifically, these difficulties limited the coach and athlete sample sizes, resulting in an underpowered sample that could have prevented effects from being detected.

The time of year that data were collected, relative to each team's season, could potentially have introduced extraneous effects in the data. Data was collected in the spring, so the soccer and football teams were in their off-seasons as fall sports. While the lacrosse team's season had not officially started at the time of data collection, the team lost in a pre-season exhibition game the weekend prior. Based on comments from the coaches and players, the team performed far below its standards in the competition. Considering previous research demonstrating the relationship between past performance and efficacy (e.g., Feltz & Lirgg, 1998; Saville et al., 2014), it is reasonable to suspect that the effect of the team's recent performance might have limited the effects of the coaches' behaviors on player efficacy beliefs.

Despite having some limitations, this study has some key strengths. Most notably, this is the first known study to use systematic observation of coaches to examine the relationship between coach behaviors and athlete efficacy beliefs. The literature on coach behaviors and

athlete efficacy has previously relied on perceptions of coach behaviors, asking athletes and/or coaches to report how the coach behaves. While this method has its advantages, direct observation yields data that provides a more objective understanding of coaches' behaviors compared to self-report measures. Although the hypotheses were not supported, this study demonstrates the utility of behavioral observation methodology in efficacy research and will hopefully open the door to further exploration.

To use the ACT as its authors designed requires software that is not easily accessible. However, this study successfully adapted the coding procedures to use the ACT with resources more readily available to researchers and practitioners. Although this method does not easily allow for continuous coding, it provides a more feasible means of assessing behavior frequencies using the ACT. This adaptation provides a guide for future researchers who wish to use the ACT without needing the previously required resources, as well as for practitioners interested in evaluating coach behaviors.

This study also had good survey completion rates by athletes. Among the teams included in the analyses, 76% of the potential athlete participants completed all required portions of the survey. This does not account for those not at practice or those who completed less than the required amount of the survey. The four questionnaires and demographics totaled 84 items; by decreasing the length of this survey (e.g., using shorter forms of the questionnaires), this completion rate could be even higher.

Future Research

The current study provides a foundation for several directions of future research. First and foremost, future studies should continue to use behavioral observation methods to explore the relationships between coach behaviors and athlete efficacy beliefs. Such studies are

necessary to advance our understanding of efficacy and its sources in the sport context. As Smith and Smoll (1991) reported, coaches' beliefs about their behaviors are often inaccurate when compared to observation systems. Understanding how coaches truly behave, rather than how they or their athletes think they behave, would also benefit the development of coach interventions aimed at increasing athlete efficacy. Observation studies would provide the foundation for informing the content of coach interventions.

Whereas this study followed a cross-sectional design, assessing coach behaviors and efficacy at a single time point, future research would benefit from a longitudinal design, collecting data across multiple time points (e.g., over the course of a season). By using a longitudinal design, future studies could analyze causal effects of coach behaviors on athlete efficacy beliefs. Moreover, a longitudinal design would allow for indirect effects to be assessed, such as the mediating role of athletes' cognitive appraisals. Finally, future research should incorporate athletes' perceptions of coach behaviors along with observed coach behaviors. Such research, in conjunction with a longitudinal design, would be advantageous in exploring the process by which efficacy information is appraised, as outlined by Bandura (1977, 1986). Overall, this would improve research on coach behaviors as sources of athletes' efficacy beliefs by assessing the process more holistically.

Conclusion

To the author's knowledge, this is the first study to explore the relationship between observed coach behaviors and athlete efficacy beliefs using behavior observation techniques. Initial analyses revealed that the coaches differed in behaviors use and the teams differed in self-efficacy and collective efficacy. Based on the main analyses, the present study found that coach behaviors as they are observed do not predict athletes' self-efficacy, other-efficacy, collective

efficacy, or relation-inferred self-efficacy (RISE) beliefs. These findings contribute to both the coach behavior and athlete efficacy literature and can be used to inform future research on how coaches influence their athletes' efficacy beliefs.

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APPENDIX A: UMCIRB APPROVAL LETTER

EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board
4N-64 Brody Medical Sciences Building· Mail Stop 682
600 Moye Boulevard · Greenville, NC 27834
Office **252-744-2914** · Fax **252-744-2284** ·
rede.ecu.edu/umcirb/

Notification of Exempt Certification

From: Social/Behavioral IRB
To: Tyler Hewitt
CC: Christine Habeeb
Date: 12/6/2022
Re: UMCIRB 22-002117
Coach Behaviors and Athlete Efficacy

I am pleased to inform you that your research submission has been certified as exempt on 12/6/2022. This study is eligible for Exempt Certification under category # 2c.

It is your responsibility to ensure that this research is conducted in the manner reported in your application and/or protocol, as well as being consistent with the ethical principles of the Belmont Report and your profession.

This research study does not require any additional interaction with the UMCIRB unless there are proposed changes to this study. Any change, prior to implementing that change, must be submitted to the UMCIRB for review and approval. The UMCIRB will determine if the change impacts the eligibility of the research for exempt status. If more substantive review is required, you will be notified within five business days.

Document	Description
Athlete Questionnaire Sections.docx(0.01)	Surveys and Questionnaires
Athlete Questionnaire Sections.docx(0.01)	Data Collection Sheet
Hewitt Thesis Proposal (10.10.2022).docx(0.01)	Study Protocol or Grant Application
Recruitment Script - Athletes.docx(0.01)	Recruitment Documents/Scripts
Recruitment Script - Athletic Director.docx(0.01)	Recruitment Documents/Scripts
Recruitment Script - Coaches.docx(0.01)	Recruitment Documents/Scripts
Survey-Consent-Paragraph-Exempt2.docx(0.01)	Consent Forms

For research studies where a waiver or alteration of HIPAA Authorization has been approved, the IRB states that each of the waiver criteria in 45 CFR 164.512(i)(1)(i)(A) and (2)(i) through (v) have been met. Additionally, the elements of PHI to be collected as described in items 1 and 2 of the Application for Waiver of Authorization have been determined to be the minimal necessary for the specified research.

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

APPENDIX B: DEMOGRAPHICS

1. Name:

   OR

   Three unique features from today (e.g., jersey number, clothing style/colors, equipment, accessories, etc.):

2. Age:
3. Sport:
4. Role: [*Dropdown list: Starter, alternating starter, non-starter, replacement, injured*]
5. Years on team:
6. Position (if applicable):
7. Academic year:
8. Do you currently have a Name, Image, and Likeness (NIL) deal?
9. Race (select all that apply):
10. Ethnicity:
11. Please rate the following statement:

    My coach's behavior today was consistent with typical practices

    1 (*not true at all*) – 5 (*completely true*)

12. Please provide any comments about your head coach's behavior today that might have been different from normal practices (e.g., did not curse as much, was nicer than usual, etc.):

APPENDIX C: SELF-EFFICACY SCALE

At this point in time, rate **YOUR confidence** in **YOUR ability** to…

1 (*no confidence at all*) – 5 (*complete confidence*)

1. Perform all the difficult technical aspects of your sport
2. Communicate effectively toward your coach at all times
3. Stay mentally strong during competition
4. Put in all your effort when working with your coach
5. Play an effective role in resolving conflict that arises between you and your coach
6. Stay in optimal physical condition
7. Play a role in devising effective goals
8. Carry out the tasks your coach sets away from practice
9. Play an effective role in maintaining a good relationship with your coach
10. Always be well organized at practice sessions
11. Always carry out your coach's instructions
12. Perform all the tactical plans set by your coach
13. Consistently reach your coach's expectations
14. Deal effectively with setbacks in your relationship with your coach

APPENDIX D: MODIFIED COACHING EFFICACY SCALE (CES)

How confident are **YOU** in **your COACH'S ability** to…

1 (*not very confident*) – 4 (*completely confident*)

1. Maintain confidence in his/her athletes?
2. Recognize opposing team's strengths during competition?
3. Mentally prepare athletes for game/meet strategies?
4. Understand competitive strategies?
5. Instill an attitude of good moral character?
6. Build the self-esteem of his/her athletes?
7. Demonstrate the skills of your sport?
8. Adapt to different game/meet situations?
9. Recognize opposing team's weakness during competition?
10. Motivate his/her athletes?
11. Make critical decisions during competition?
12. Build team cohesion?
13. Instill an attitude of fair play among his/her athletes?
14. Coach individual athletes on technique?
15. Build the self-confidence of his/her athletes?
16. Develop athletes' abilities?
17. Maximize your team's strengths during competition?
18. Recognize talent in athletes?
19. Promote good sportsmanship?
20. Detect skill errors?
21. Adjust your game/meet strategy to fit your team's talent?
22. Teach the skills of your sport?
23. Build team confidence?
24. Instill an attitude of respect for others?

APPENDIX E: COLLECTIVE EFFICACY QUESTIONNAIRE FOR SPORTS (CEQS)

Rate **YOUR TEAM'S** confidence, in terms of the upcoming game or competition, that **your team** has the ability to …

0 (*not at all confident*) – 10 (*extremely confident*)

1. Outplay the opposing team
2. Resolve conflicts
3. Perform under pressure
4. Be ready
5. Show more ability than the other team
6. Be united
7. Persist when obstacles are present
8. Demonstrate a strong work ethic
9. Stay in the game when it seems like your team isn't getting any breaks
10. Play to its capabilities
11. Play well without your best player
12. Mentally prepare for this competition
13. Keep a positive attitude
14. Play more skillfully than the opponent
15. Perform better than the opposing team(s)
16. Show enthusiasm
17. Overcome distractions
18. Physically prepare for this competition
19. Devise a successful strategy
20. Maintain effective communication

APPENDIX F: RISE SCALE

At this point in time, estimate how confident **your COACH** is in **YOUR ability** to …

1 (*no confidence at all*) – 5 (*complete confidence*)

1. Perform all the difficult technical aspects of your sport
2. Communicate effectively toward your coach at all times
3. Stay mentally strong during competition
4. Put in all your effort when working with your coach
5. Play an effective role in resolving conflict that arises between you and your coach
6. Stay in optimal physical condition
7. Play a role in devising effective goals
8. Carry out the tasks your coach sets away from practice
9. Play an effective role in maintaining a good relationship with your coach
10. Always be well organized at practice sessions
11. Always carry out your coach's instructions
12. Perform all the tactical plans set by your coach
13. Consistently reach your coach's expectations
14. Deal effectively with setbacks in your relationship with your coach