TEAMMATE EFFICACY AND TEAMMATE TRUST: AN EXAMINATION OF TEAM DYNAMICS IN VOLLEYBALL DEFENSE

By

Lori Dithurbide

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Kinesiology

2011

ABSTRACT

TEAMMATE EFFICACY AND TEAMMATE TRUST:
AN EXAMINATION OF TEAM DYNAMICS IN VOLLEYBALL DEFENSE

By

Lori Dithurbide

Very little research in the context of sport has examined the constructs of teammate efficacy and teammate trust. Past research in the counseling and organization psychology areas suggest that efficacy in other group members (Lent & Lopez, 2002) and trust in teammates (Dirks, 1999) could have a significant impact on team performance and other group dynamic constructs. The purpose of this study was to examine the constructs of teammate efficacy, its relationship to self-efficacy, collective efficacy and team performance, and furthermore to examine teammate trust as a potential moderator between teammate efficacy and team performance. Eighteen girl's club volleyball teams were studied across an entire competitive season answering questionnaires of efficacy, trust and backing-up behaviors at three time points during their season. It was found that that the relationship between collective efficacy and teammate efficacy became stronger over the course of a competitive season. Teammate efficacy was not found to be a significant predictor of team performance. Teammate efficacy and teammate trust were highly correlated (i.e., showed multicollinearity) and therefore a moderating relationship between these variables to predict team performance was not tested. It was also found that decreased teammate trust significantly predicted increased feelings of having to back-up or cover for teammates while accounting for collective efficacy. Findings from this study contribute to a better understanding of these constructs in the sporting arena and offer a starting point for future research in this area.

Dedication

To my family and friends who have always shown the greatest efficacy and trust in me.

Acknowledgments

A special thank you to my advisor and dissertation committee chair Dr. Deborah Feltz.

Thank you to my dissertation committee members, Drs. Dan Gould, Dale McKnight, and John Hollenbeck for providing guidance and direction on this project.

Thank you also to the athletes, coaches, and club directors who volunteered their time and effort to make this study possible.

Lastly, this project would not have been possible without the help of Kyra Dewyer, Lauren Dinverno, Jason Giecek, Kaitlynn Osborn, Lisa Griffiths, and Graig Chow.

Your help is very much appreciated!

TABLE OF CONTENTS

LIST OF TABLES

Chapter 1

Introduction

The nature of interdependent sport teams, is just that: teammates are dependent upon each other in order to perform successfully. No matter how talented an athlete may be, or how much he or she may hypothetically carry the team on his or her shoulders, one athlete cannot win a team's championship. Athletes who compete in interdependent sport teams, such as basketball, hockey, baseball, and volleyball must depend on their teammates to fulfill their own roles within the team in order for the team to perform well. In order for teams to be successful, each individual athlete must carry his/her own weight and successfully perform his/her role. This means that each teammate must, in some ways, trust that other teammates will fulfill their own tasks. When athletes are confident in their teammates' abilities and trust that they will perform to their potential, they can then focus on their own tasks and in turn, the team, as a whole should perform to its potential.

Before I introduce the construct of teammate efficacy, it is important to present a brief overview of the construct of self-efficacy to provide a foundation on which teammate efficacy is based with regard to this study. Efficacy beliefs are the core of Social Cognitive Theory (SCT). In SCT, human behavior is referred to as a triadic, dynamic, and reciprocal interaction of personal factors, behavior, and the environment (Bandura, 1986). According to SCT, an individual's behavior is uniquely determined by each of these three factors (Bandura, 1986). Individuals possess self-beliefs that allow them to control their thoughts, feelings, and actions, which in turn control how they behave (Bandura, 1986). Bandura defined self-efficacy as a person's judgment of his/her ability to organize and accomplish courses of action deemed necessary to perform to one's potential. However, a large number of sports, and other goal-

striving tasks for that matter, are not performed by a single person. Collective efficacy is "a group's shared belief in their conjoint capabilities to organize and execute the courses of action required to produce given levels of attainments" (Bandura, 1997, p. 476). The collective efficacy beliefs a team holds can influence the tasks teams choose to complete, the amount of effort the team puts forth toward a task, how a team perseveres in the face of adversity and the team's ability to bounce back after a set-back (Bandura, 1997). In short, efficacy beliefs do not represent the level of ability that individuals or teams possess; rather they are what athletes believe they can do with their abilities in a given circumstance (Bandura, 1997).

Although efficacy belief research in sport and physical activity has focused mainly on self-efficacy and collective efficacy, the main focus of this dissertation is other-efficacy, or more specifically, teammate efficacy. Lent & Lopez (2002) have proposed a tripartite view of relational efficacy beliefs: self-efficacy, other-efficacy, and relation-inferred self-efficacy (RISE). This proposition was put forth due to Lent and Lopez's beliefs that the interpersonal context in the study of self-efficacy was neglected. Lent and Lopez contend that there are many situations involving close relationships that can serve as a context for building, maintaining, regaining, and harming one's sense of efficacy. Even though their focus is on counseling psychology, one of these situations or contexts can be team sport (Feltz, Short, & Sullivan, 2008). Lent and Lopez define close relationships as "the extent that relationship partners have mutual impact on one another" (p.258) and "there is 'high interdependence' between those in a close relationship" (p.258). The team sport context, especially sports that are high in interdependence such as volleyball, provide a good example of a close relationship.

Lent and Lopez (2002) define *other-efficacy* (i.e., teammate efficacy in this study) beliefs as each partner's view of the other's capabilities and state that these beliefs can be influenced by

multiple factors such as perceptions of the other's performances (e.g., my teammate performed successfully in the past, therefore I have higher beliefs in their capabilities), beliefs about the confidence and capabilities of similar others (e.g., I hold low capability beliefs of very similar athletes to my teammate, therefore my teammate efficacy beliefs towards this said teammate are low) and third-party views of the other's capabilities (e.g., coach's beliefs in the teammate). In turn, *other-efficacy* beliefs can potentially influence the type and amount of effort expended in joint pursuits (e.g., winning a game), reliance on other's feedback, and persistence intentions.

Although admittedly related, Lent and Lopez (2002) also make a point to differentiate between collective and other-efficacy. Where collective efficacy is a group (or corporate as stated by the authors) level agency, other-efficacy is an individual level of agency. Other-efficacy entails an individual's beliefs about the capability or effectiveness of others in situations where partners or teammates must work together to produce group outcomes. Because other-efficacy involves the beliefs that partners or teammates hold about each other's *separate* capabilities, it is an individual level construct. Collective efficacy beliefs refer to the *shared* perceptions of the group about the *conjoint* capabilities to produce an outcome. However, Feltz et al. (2008) argue that Lent and Lopez are measuring other efficacy in the same way as collective efficacy except that it is in dyad teams rather than teams of three or more (i.e., "Rate your confidence in your team's [partner's] capabilities to perform at a given level"). Because Lent and Lopez's main focus was on dyadic relationships, the differences between the two constructs can be clearer than in larger groups such as sport teams. Specifically, other-efficacy does not include one's beliefs in one's own abilities as a part of the team; the individual is removed from the perception. Collective efficacy assumes the individual conjointly with the remaining team members; therefore there is no separation between 'myself' and 'them'. How

confident one is in one's dyad team and how confident one is in one's partner are clearly different, but the differences may not be significant with larger teams and when rating one's teammates is done at the aggregate level.

Research on other-, or teammate efficacy, has been limited in the sport context, especially in relation to performance outcomes. Beauchamp and Whinton (2005) examined self- and other-efficacy and their relationship to performance in the dyadic relationship between rider and horse in equestrian eventing. The authors hypothesized and results supported that other-efficacy would be able to explain unique variation in riding performance above and beyond that explained by self-efficacy beliefs alone.

While additional research has examined other-efficacy in sport (see Jackson, Beauchamp, & Knapp, 2007; Jackson, Knapp, & Beauchamp, 2008), the equestrian study, to my knowledge, is the only one to examine the link to performance. Consequently, this is an area in the sport literature that could use more attention. In addition, Lent and Lopez (2002) state that when successful performances require competencies from an interdependent group, it is advantageous for the members to possess favorable beliefs about both their own and teammates' capabilities. In fact, in these types of situations, they posit that collective efficacy might be conceptually equivalent to the sum of self-efficacy and other-efficacy ratings. However, in interdependent teams, the coordination and interaction between each athlete is far more complex than simply the sum of its parts, therefore Lent and Lopez's proposition may not hold true in these circumstances.

Highly interdependent teammates must often depend on each other to fulfill their roles and successfully perform tasks. Especially in interactive and interdependent sport teams, athletes must trust their teammates to do their job. Consequently, a lack of trust in each other could

potentially lead to changes in cognitive beliefs (i.e., collective efficacy beliefs, worry, motivation, and satisfaction) and behavioral changes (i.e., backing-up behaviors, and performance). Where efficacy in one's teammate represents the beliefs that a teammate *can* perform a certain task, or their capabilities, trust in one's teammate (for the purpose of this study) represents the beliefs that a teammate *will* perform a certain task. Even though an athlete has the capabilities to perform a task, it is not guaranteed that they will when it matters most. Factors such as anxiety, fatigue, arousal levels, and motivation may influence whether or not an athlete actually performs up to his/her potential. Although trust seemingly is an important factor in interdependent groups such as sport teams, very little research has been conducted in this context.

The concept of trust has been examined on many societal levels but for the purpose of this dissertation, I will focus on the interpersonal level of trust and more specifically, task-related trust (i.e., I trust my teammate will perform a task) as opposed to social trust (i.e., I trust my teammate with my secrets). Because so little research has examined trust in sport teams (exception: Dirks, 2000), the majority of the theoretical background, framework, and empirical evidence is derived from the organizational setting. Mayer, Davis, and Schoorman (1995) defined trust as "a willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that party" (p. 712). Additionally, Rousseau, Sitkin, Burt, and Camerer (1998) proposed a cross-disciplinary definition of trust as "a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another" (p. 395). Dirks and Ferrin (2001) further conceptualize trust as a psychological state, such as a belief or attitude, toward another

individual, and not a dispositional construct. In interdependent sport teams, the other individuals are one's teammates. An athlete must trust his or her teammate to behave or perform in a way that works best for the team. For the purpose of this study, teammate trust is conceptualized along these propositions but is more specifically defined as *the belief or expectation that one's teammate will effectively perform a particular action that is necessary for one's own, and the team's benefit.* It should be clarified that this definition and study does not include perceptions of benevolence or integrity of the other party (e.g. Mayer, Davis, & Schoorman, 1995), but is solely about the effective capability of the other person on one's (or the team's) behalf. Therefore this type of trust is actually a trusting belief-competence and was selected because it related closely to how effective team members are in doing their part on the team. Hereafter, the term "trust" will refer to the trusting belief-competence type of trust, unless it refers to literature that uses a broader trust definition.

Although trust has been studied and linked to many constructs in the organizational setting, much like sport, performance has been a popular outcome variable. Even 35 years ago, trust was a frequently cited determinant of group performance (Golembiewski & McConkie, 1975). An example in sport is Dirks' (2000) study of NCAA basketball teams where he examined the effect of trust in the coach and trust in teammates on team performance. Results showed a significant relationship between trust in the coach and team performance but no significant direct relationship was found between trust in teammates and team performance.

Dirks and colleagues (Dirks, 1999; Dirks & Ferrin, 2001) have however argued that even though the direct relationship between trust and team performance has dominated the literature, in some circumstances trust may serve better as a moderator between other variables and team performance. A review of the trust literature comparing both the main (i.e., direct) effects and

moderating (i.e., indirect) effects of trust on group outcomes, Dirks and Ferrin (2001) found that the direct effects of trust on performance outcomes were weak and inconsistent. In exploring the moderating model of trust, the authors examined if trust provided the conditions under which higher performance and other outcomes were likely to occur.

According to Dirks and Ferrin's (2001) argument, trust represents the experiences and knowledge about an athlete's teammate. Consequently, trust will affect how an athlete assesses the future behavior of a teammate and how he or she interprets the actions of a teammate. Their first proposition is that trust will moderate the relationship between motivational constructs and outcomes such as performance. This is based on the idea that trust can impact performance but does not directly cause one to perform or behave in a certain manner. Evidence consistent with this proposition included a study that found no main effect between trust and performance but found a moderating effecting of trust between group members' motivation and group processes and outcomes (Dirks, 1999).

Research has found a robust relationship between efficacy beliefs (self-, collective, and recently, other efficacy) and performance. Also, efficacy beliefs are posited to be the primary determinant of an individual's level of motivation to accomplish a certain goal (Bandura, 1977, 1997). This is manifested by the choice of activity an individual makes, the effort one puts forth towards the task and how much one persists in the face of failure. The accordant hypothesis that might follow is that the level of trust in one's teammates moderates the relationship between efficacy beliefs and performance.

For instance, an athlete participating in a sports team may have high levels of beliefs in his or her teammate's ability to perform a certain task that is important to the team's performance (i.e., efficacy beliefs). However, if this athlete does not *trust* that his or her teammate will

perform this task, for example, in an important game situation when the athlete and/or team is vulnerable, the team's performance may not reach its potential, or the distrusting athlete may compensate by performing differently (e.g., playing "out of position"). If athletes perceive a need to back-up other teammates, they may put themselves in a position that may compromise their own and their team's performance. However, if the team is highly coordinated, backing-up correctly could also lead to improved performance. In addition, the level of trust an athlete has for his or her teammates may have an affect on how one attributes success or failure of the team. Therefore, if there is no trust between teammates, an athlete may not exert as much effort towards the team's goal because he or she cannot depend on his or her teammates to do the same. On the other hand, if efficacy beliefs are high and there is trust between teammates, athletes may put forth more effort towards the task and worry less about their teammates, allowing them to focus on their roles and tasks towards the group's goal. This may consequently lead to an increase in performance.

A second proposition made by Dirks and Ferrin (2001) states that trust will moderate the relationship between a teammate's action and the truster's (athlete) response. In other words, trust can affect how one interprets another person's actions. Consequently, if an athlete has high levels of trust towards a teammate, he or she is more likely to interpret the teammate's behavior favorably than if there were low levels of trust. Consequently, if an athlete holds high levels of trust towards a teammate, perhaps efficacy beliefs towards this teammate may remain stable over time, as the perceptions of even questionable performances stay favorable. Furthermore, if trust levels are lower, perceptions of the teammate's behaviors should be negative, even if the efficacy beliefs towards this teammate are high. These perceptions of behavior from teammates could

lead to changes in affect, conflict within the group, and potentially, changes in behavior in other teammates, such as having to back-up these teammates or cover for them on the court or field.

In sum, the sporting arena offers the ideal context to examine the highly interdependent and relational constructs of teammate efficacy and teammate trust; neither of which have been studied in the team sport domain to date. Research in the counseling and organizational settings suggest that teammate efficacy and teammate trust may have significant effects not only on team performance but also on other team processes. It is for these reasons, and based on this foundation that I chose to further the research in the sport domain.

Purpose of the Study

The purpose of this dissertation is to examine the constructs of teammate efficacy, its relationship to self-efficacy, collective efficacy and team performance, and furthermore to examine teammate trust as a potential moderator between teammate efficacy and team performance.

Contextual Factors

The context chosen for the current study was sport. Team sports provide an ideal context in which to examine teammate efficacy and teammate trust, because sport teams epitomize the intact group. They perform a meaningful task where each member shares a common goal and member interdependence is very high.

Female club volleyball was selected for this study for both conceptual and practical reasons. First, volleyball is a highly interactive and interdependent team sport where efficacy beliefs and trust can play an integral part in the performance of the team. Secondly, volleyball, especially club volleyball in the Mid-West region, is played mostly if not entirely by females,

therefore essentially controlling for gender differences. Finally, club volleyball was chosen because of the timing of their season, which begins shortly after the end of the holiday season.

Hypotheses

1. Collective efficacy and teammate efficacy will be positively related to each other but remain two distinct variables (show no multicollinearity).
2. Teammate efficacy is a significant predictor of team performance while controlling for collective efficacy, trust in the coach, and past performance.
3. Teammate trust will moderate the relationship between teammate efficacy and team performance where increased levels of teammate trust will strengthen the relationship between teammate efficacy and team performance, and decreased levels of teammate trust will weaken it.
4. Teammate trust will negatively predict feelings of having to back-up or cover for teammates while controlling for collective efficacy.

Research Questions

1. Are there differences in the relationships between efficacy beliefs (self-, collective, and teammate) and trust over time?
2. Do teammate trust and/or trust in the coach have an effect on team attributions while controlling for subjective performance?

Delimitations

Because of the specificity of the sample, the findings will be limited to female club-level interdependent team sports, and thus may not completely generalize to other populations. For example, the results may not be applicable to collegiate level or male volleyball teams. In addition, the results may not be applicable to sports with a lower level of team interdependence,

such as swimming or gymnastics. Lastly, because some of the measures will be situation-specific to volleyball at the club level, they are not appropriate for other sports.

Definitions

Collective efficacy: an individual's belief in his/her team's capabilities to organize and execute the courses of action necessary to produce certain levels of attainment.

Other efficacy: an individual's belief in another's capabilities to organize and execute the courses of action necessary to produce certain levels of attainment. For this dissertation, see *Teammate efficacy*.

Self-efficacy: an individual's belief of his/her capabilities to organize and execute the courses of action necessary to produce certain levels of attainment.

Team performance: a team's win percentage as well as the average points scored against a team where a higher win percentage and lower average points scored against reflect greater team performance.

Teammate efficacy: an individual's belief in his or her teammates' capabilities to organize and execute the courses of action necessary to produce certain levels of attainment.

Teammate trust: the belief or expectation that one's teammate will effectively perform a particular action that is necessary for one's own, and the team's benefit.

Chapter 2

Review of Literature

The purpose of this chapter is to provide a review of the literature that is relevant to the variables and hypotheses of this study. The chapter begins by providing a foundation for the hypotheses, which represents an overview of the literature supporting the efficacy belief-performance relationship. Next, support is presented for the inclusion and importance of other's, or teammate efficacy belief in the research field of efficacy belief theory. Lastly, this is followed by a summary of the literature on trust including general theoretical background, research on trust in groups or organizational teams (where more of the related research has been conducted), as well as how this research links to the sport domain.

The efficacy judgments made by individuals with regards to their own or of their teams' abilities are the result of a complex process of self-, or team, appraisal and persuasion that is dependent on a cognitive process of varying sources of efficacy information (Bandura, 1990). These varying sources include, but are not limited to, past performance accomplishments or mastery experiences, vicarious experiences, verbal persuasion, and physiological states (Bandura, 1977, 1997). Of all sources linked to efficacy beliefs, past performance has been deemed the most influential (Bandura, 1997). Additionally, in the sport psychology literature, performance also has been the dependent variable of greatest interest and research regarding the predictive strength of self- and collective efficacy beliefs (Feltz et al., 2008).

Self-efficacy and Performance

The study of self-efficacy and performance in sport began in the late 1970s with two distinct lines of research: the Feltz series of studies and the Weinberg series of studies (Feltz et al., 2008). Feltz and her colleagues focused more on the relationships between self-efficacy and

performance across time (Feltz, 1982, 1988; Feltz, Landers, & Reader, 1979; Feltz & Mungo, 1983); whereas Weinberg and his colleagues focused more on experimental methods using competitive tasks (Weinberg, 1985; Weinberg, Gould, & Jackson, 1979; Weinberg, Gould, Yukelson, & Jackson, 1981; Weinberg, Yukelson, & Jackson, 1980). Since this early period, efficacy-belief research in sport has demonstrated wide generalizability due to the diverse methodologies used, measurements used, and with a variety of sport and motor tasks. Overall, a consistent moderate relationship has been found between self-efficacy and sport performance, which has been supported by a meta-analytic review (Moritz, Feltz, Fahrbach, & Mack, 2000). Results from this meta-analysis also indicated that when a non-significant or negative relationship was found between self-efficacy and performance it was likely due to measurement or methodological issues such as non-concordant efficacy belief and performance measures or too much time between the assessment of each variable. The relationship between self-efficacy and performance has also shown to be a reciprocal one. Not only does self-efficacy positively affect performance accomplishments, but performance also has shown to increase one's efficacy beliefs in a temporarily recursive fashion (Feltz, 1982; McAuley, 1985).

It should be noted however that arguments have been made against the positive relationship between efficacy and performance. Vancouver and his colleagues argued for a negative relationship between efficacy and performance (Vancouver, Thompson, Tischner, & Putka, 2002) where better performance leads to increased levels of self-efficacy, which in turn leads to complacency and overconfidence for the following performance. This results in poorer performance whereas lower levels of self-efficacy leads to more practice and more effort to improve in future performances. Vancouver and his colleagues found that self-efficacy was negatively related to performance within-person over time (Vancouver, Thompson, & Williams,

2001; Vancouver, et al., 2002; Vancouver & Kendall, 2006) but positively related to performance at the between-person level, using computer games and academic performance as the outcome.

Further research in the sporting and physical activity context did not support Vancouver's (Vancouver, Thompson, & Williams, 2001; Vancouver, et al., 2002; Vancouver & Kendall, 2006) propositions. Gilson (Gilson, Chow, & Feltz, in press) found that when using a less cognitive task (i.e., squat lifting performance), self-efficacy was positively related to performance at both the within-person and between-person levels when controlling for the participants' past performance. In addition, research both in individual and team sport has examined the relationship between collective efficacy and performance across time and within-person/within-team and significant positive relationships have been consistently found (Feltz, Chow, & Hepler, 2008; Myers, Feltz, & Short, 2004; Myers, Payment, Feltz, 2004).

Collective Efficacy and Performance.

The collective efficacy and performance relationship has been studied similarly to the self-efficacy and performance relationship. There have been experimental and field study designs, and results have shown similar significant positive findings. Collective efficacy and performance research in sport began in the early 1990s when Spink (1990) examined the relationship between both variables in volleyball teams. Using a sample of elite volleyball teams, Spink found that teams higher in collective efficacy (determined prior to the commencement of a tournament) finished in significantly higher rankings at the end of the tournament than teams low in collective efficacy.

In contrast to Spink's field study, Hodges and Carron (1992) investigated group performance in female and male triads with different levels of collective efficacy in a muscular

endurance task in a laboratory setting. Groups were determined by randomly assigning each participant to a high or low efficacy group by providing bogus feedback after a pre-test session. Using this experimental design, the researchers were able to manipulate and control for each group's level of collective efficacy. To test the impact of the level of collective efficacy, the competition was manipulated so that each group would constantly lose to a confederate group. Results of the study showed that the high efficacy groups improved their performance following failure whereas low efficacy groups showed a decrease in performance after failure.

Extending this research, Lichacz and Partington (1996) examined performance differences between true (rowing crews and members of the same basketball team) and ad hoc groups (comprised of members with no playing history). This study used a rope-pulling task, which was completed by 25 male undergraduate students. Collective efficacy was manipulated through bogus feedback. Results showed that the group's performance was significantly affected by both factors, although more so by the group's history than the manipulation through bogus feedback. Groups with higher levels of collective efficacy and those who were members of true groups performed better. No other study had examined collective efficacy by incorporating true groups and performance history in a controlled laboratory setting at the time of the study.

Collective efficacy and team performance research has not been limited to laboratory studies. Research has been extended into the field, adding to Spink's original study, with Feltz and Lirgg (1998). They examined team efficacy with competitive ice hockey teams throughout an entire season. The authors followed approximately 160 male ice hockey players throughout an entire competitive hockey season, measuring self-efficacy, collective efficacy, and performance prior to every game. Collective efficacy was measured by using a hockey specific measure regarding specific tasks and actions that must be accomplished during a match for a team to be

successful in their attempt to win. Performance was measured using the teams' win and loss records. Results of the study supported the researchers' hypotheses that aggregated team efficacy scores were a stronger predictor of team performance than aggregated self-efficacy scores. It also supported the notion of a link between collective efficacy and team performance found in laboratory-based studies. The authors also found that following a failure (i.e., team loss), team member's collective efficacy decreased, but their individual efficacy belief did not.

Myers, Payment, and Feltz (2004) continued with this research in ice hockey by examining the reciprocal relationship between collective efficacy and team performance in women's ice hockey. Collective efficacy beliefs and performance assessments were completed on weekends where teams played each other twice (i.e., both Friday and Saturday). The results indicated that the level of collective efficacy moderately and positively influenced the team's performance for the same day performance (Saturday) when controlling for the previous day's (Friday) performance. Results also indicated that previous day's performance has a small and positive influence on the next day's collective efficacy scores. The latter finding supports and extends the finding of Feltz and Lirgg (1998) that there is a positive influence of previous performance on subsequent collective efficacy across teams. This factor had been missing and limiting in similar past research. Notable limitations to the Myers, Payment and Feltz study include a small number of games and teams therefore restricting the ability to generalize the findings.

Myers, Feltz, and Short (2004) extended the aforementioned study through their study of collective efficacy and performance in football teams. Offensive football players (N = 197) from 10 different university teams completed self- and collective efficacy measures within 24 hours prior to each Saturday afternoon game. Performance measures were obtained by analyzing

statistics provided by conference headquarters. Results suggested that aggregated collective efficacy prior to performance positively influenced subsequent offensive performance, and that previous offensive performance negatively influenced subsequent aggregated collective efficacy within teams and across games. Self-efficacy did not show a similar pattern. Within weeks and across teams, aggregated collective efficacy prior to performance also was a positive predictor of subsequent offensive performance, and previous offensive performance was a positive predictor of subsequent aggregated collective efficacy. Consistent with Feltz and Lirgg (1998), aggregated collective efficacy appeared to positively influence offensive performance whereas aggregated self-efficacy did not within teams and across games. This line of research demonstrates the consistent and robust relationship between collective efficacy and sport performance that has been found in both the laboratory and field setting.

Extending the work on the collective efficacy-performance relationship, research has examined the role of group cohesion and team-referent causal attributions. Heuzé, Raimbault, and Fontayne (2006) examined the mediating effects in the relationships between group cohesion, collective efficacy, and individual performance in professional basketball teams. Male basketball players (N = 154) completed the French version of the Group Environment Questionnaire, and a 27-item basketball specific collective efficacy measure, while performance was assessed by individual statistics. The authors found that collective efficacy mediated the relationship between the Group Integration-Task (GI-T) dimension of group cohesion and performance and GI-T mediated the relationship between performance and collective efficacy. (It should be noted that all analyses in this study were conducted at the individual level, which poses a limitation to its findings. Both cohesion and collective efficacy are defined as group-level constructs and should be examined at the group-level to account for the interdependence of

the data). Thus, this finding may indicate that the team's sense of cohesion towards its task does not directly predict individual basketball performance, but is cognitively processed as an efficacy judgment about the team's collectively capabilities, which in turn, predicts performance.

Other Efficacy (Teammate Efficacy).

Lent & Lopez (2002) have proposed a tripartite view of relational efficacy beliefs: self-efficacy, other-efficacy, and relation-inferred self-efficacy (RISE). This proposition was put forth due to Lent and Lopez's beliefs that the interpersonal context in the study of self-efficacy was neglected. Lent and Lopez contend that there are many situations involving close relationships that can serve as a context for building, maintaining, regaining, and harming one's sense of efficacy. One of these situations or contexts can be team sport. Teammates often spend many hours training and competing together. Lent and Lopez define close relationships as "the extent that relationship partners have mutual impact on one another" (p.258) and "there is 'high interdependence' between those in a close relationship" (p.258). The team sport context, especially sports that are high in interdependence such as volleyball, provide a good example of a close relationship. Because self-efficacy theory is rooted in social cognitive theory, it is assumed that the social environment has great influence on our efficacy perceptions, may they be towards the self, the team, or our teammates. The close relationships that individuals hold with each other are then consequently a part of the social environment.

Lent and Lopez (2002) define *other-efficacy* beliefs as each partner's view of the other's capabilities and state that these beliefs are influenced by multiple factors such as perceptions of the other's performances, beliefs about the efficacy of similar others and third-party views of the other's capabilities (e.g., coach's beliefs in the teammate). In turn, *other-efficacy* beliefs can

potentially influence the type and amount of effort expended in joint pursuits (e.g., winning a game), reliance on other's feedback, and persistence intentions.

Although admittedly related, Lent and Lopez (2002) also make a point to differentiate between collective and other-efficacy. Where collective efficacy is a group (or corporate as stated by the authors) level agency, other-efficacy is an individual level of agency. Other-efficacy entail individual's beliefs about the efficacy of others in situations where partners or teammates must work together to produce group outcomes. Because other-efficacy involves the beliefs that partners or teammates hold about each other's *separate* capabilities, it is an individual level construct. That is, other-efficacy (i.e., teammate efficacy) is one's beliefs about their teammate's capabilities. Collective efficacy refers to the *shared* perceptions of the group about the *conjoint* capabilities to produce an outcome, and although it also is measured at the individual level, it is aggregated up to the group level to represent the collective construct (Bandura, 1997). Because Lent and Lopez's main focus was on dyadic relationships, the differences between the two constructs can be clearer than in larger groups such as sport teams. However, it should be noted that other-efficacy does not include one's beliefs in one's own abilities; the individual is removed from the perception. Collective efficacy includes the individual conjointly with the remaining team members; therefore there is no separation between 'myself' and 'them'.

Lent and Lopez (2002) also raise an interesting point with regards to the congruency of self- and other-efficacy beliefs. They state that when successful performances require competencies from an interdependent group, it is advantageous for the members to possess favorable beliefs about both their own and teammates' capabilities. In fact, in these types of situations, they posit that collective efficacy might be conceptually equivalent to the sum of self-

efficacy and other-efficacy ratings. However, in interdependent teams, the coordination and interaction between each athlete is far more complex than simply the sum of its parts, therefore Lent and Lopez's proposition may not hold true in these circumstances.

Feltz and colleagues (2008) note, however, a difference between Lent and Lopez's (2002) conceptualization and operationalization of the concept of other-efficacy. Their previous use of an other-efficacy scale had a stem that was ability-focused assessment (i.e., rate your partners' ability), whereas they conceptualize the concept more in line with a confidence-focused assessment (i.e., rate your partner's confidence in his/her ability). This raises a similar argument put forth by Myers and Feltz (2007) with regards to the measurement of collective efficacy that researchers should aggregate individual responses to collective efficacy items. Item stems should not ask an individual to assess the team's confidence in its capabilities because individuals are not as capable of assessing the group's *beliefs* about its abilities as they are in assessing their own beliefs about the group's abilities. That is, the group, an inanimate social system cannot have beliefs, whereas the individuals who make up such a group can. Because this study goes beyond the dyadic relationship and will be examining teams of more than two members, I chose to measure other-efficacy, or teammate efficacy, using the ability-focused approach.

The study of other- or teammate efficacy in the sporting context has been limited to only a handful of recent publications. The first one by Beauchamp and Whinton (2005) examined self- and other-efficacy in the dyadic relationship between rider and horse in equestrian eventing. Riders (N = 187) competing in 1-day eventing (combination of dressage, show-jumping, and cross-country disciplines) competitions participated in the study. Task specific self- and other (horse) efficacy beliefs were assessed prior to each stage of the competition. The overall purpose of the study was to examine the relationships between self-efficacy, other-efficacy, and

performance. The authors hypothesized that other-efficacy would be able to explain unique variation in riding performance above and beyond that explained by self-efficacy beliefs alone. With regards to the dressage portion of the competition, Beauchamp and Whinton found that other-efficacy was able to explain unique variation in dressage performance beyond that explained by self-efficacy. The two other events showed no significant relationship between self-efficacy and performance, however the authors noted that this was likely due to the lack of variation in the performance scores. However, one could suggest that in this situation, self-efficacy may mediate the relationship between other-efficacy (belief in the horse's capabilities) and performance.

Although not examining Lent and Lopez's (2002) tripartite view of efficacy in relation to performance, researchers Jackson, Knapp, and Beauchamp (Jackson, Beauchamp, & Knapp, 2007; Jackson, Knapp, & Beauchamp, 2008) have furthered the research on other-efficacy in the sporting context. The first of the two studies examined the interrelationships among the three forms of relational efficacy within junior tennis dyads. Furthermore, Jackson and colleagues (2007) examined the relationships between all three forms of efficacy beliefs and the athletes' perceptions of their commitment to and satisfaction with the current partnerships. In addition, Jackson and colleagues also examined actor and partner effects. That is, actor effects are when both predictor and outcome variables occur within an individual (e.g., self-efficacy beliefs influence individual performance) and partner effects are when the predictor variable affects the outcome in the partner (e.g. other-efficacy beliefs that an individual holds about their partner affects how the partner performs). In sum, the three forms of efficacy identified in the tripartite view of efficacy held by one individual may influence the motives and behaviors toward a partner, and may also impact the motives and behaviors of that partner. Results showed that self-

efficacy and other-efficacy predicted athlete commitment and satisfaction, respectively. Results also indicated actor effects for both other-efficacy and RISE in relation to self-efficacy so that believing in one's partner's capabilities to perform effectively leads to an elevated sense of one's own self-efficacy. With regards to partner effects, only a relationship between self-efficacy and commitment was found. That is, the results suggest that elevated levels of self-efficacy experiences by one athlete may increase levels of commitment to the relationship by his or her partner. Therefore, relational efficacy beliefs may have implications not only for the individual holding the belief, but other team members as well.

Using a qualitative approach, Jackson and his colleagues (2008) furthered the sport literature of the tripartite view of efficacy belief by examining the antecedents and consequences of self-efficacy, other-efficacy and RISE within six international-level athlete dyads. Results from the interviews revealed four higher-order categories across the three efficacy constructs containing themes regarding: oneself, one's partner, the dyad, or external factors. Not surprisingly, perceptions regarding oneself were most frequently cited as sources of self-efficacy. These included past individual performance achievements, experience, and pre-competition preparation. Verbal persuasion from their partner as well as the two intrarelationship cognitions of other-efficacy and RISE were also found to be sources of self-efficacy. Sources of other-efficacy included experience with partner, partner and dyad past performance accomplishments, comparison with past partners and other athletes as well as both psychological and physiological perceptions of the partner (e.g., calmness, strength, etc). Finally, sources of RISE included ones' own self-efficacy beliefs, one's partner's verbal and non-verbal behavior, as well as one's own motivation, past mastery accomplishments and physiological factors.

With regards to consequences of each efficacy beliefs, there was a distinction between those that related to intrapersonal and interpersonal concepts. Self-efficacy outcomes included improved affect, individual performance, greater effort and motivation, as well as greater ability to concentrate on task-related aspects of their performance. Consequences of other-efficacy included more open and positive verbal behavior toward the partner, greater responsiveness to the partner, and enhanced satisfaction in the relationship. However, not all consequences for other-efficacy were positive. Some athletes thought that elevated levels of other-efficacy might be related to potential negative affective responses, and even possible breakdowns in relationships. Lastly, consequences of RISE included enhanced self-efficacy beliefs, relationship persistence intentions, greater relationship satisfaction and elevated motivation in relational contexts.

Trust

As mentioned in Chapter 1, the concept of trust has been examined in many societal levels but for the purpose of this dissertation, I will focus on the interpersonal level of trusting belief-competence type of trust. Because so little research has examined trust in sport teams, the majority of the theoretical background, framework, and empirical evidence will derive from the organizational setting.

Although trust has been studied and linked to many constructs in the organizational setting, much like sport, performance has been a popular outcome variable. Even 35 years ago, trust was a frequently cited determinant of group performance (Golembiewski and McConkie, 1975). However, Dirks and colleagues (Dirks, 1999; Dirks & Ferrin, 2001) have argued that even though the direct relationship between trust and team performance has dominated the literature, in some circumstances trust may serve better as a moderator between other variables and team

performance. Dirks and Ferrin (2001) conducted a review of the trust literature comparing both the main (i.e., direct) effects and moderating (i.e., indirect) effects of trust on group outcomes. The review for the direct effects model included 43 studies where 29 of these studies had behavioral and performance outcomes. Dirks and Ferrin argued that most main effect models contend that trust about another individual affects how one behaves in interactions with the trustee. Mayer et al. (1995), supporting this contention, provided a model explaining that a person's trust towards another leads to a willingness to risk, which in turn leads to risk taking. That is, higher levels of trust in a partner increase the likelihood that one will take a risk with the said partner and/or increases the amount of risk that is assumed. Risk-taking then leads to positive outcomes such as increased performance. Dirks and Ferrin (2001) found that the direct effects of trust on performance outcomes were weak and inconsistent, and given these findings they suggest that more research is needed to better understand the effects of trust on behavioral and performance outcomes.

In exploring the moderating model of trust, the authors examined if trust provided the conditions under which higher performance and other outcomes were likely to occur. According to Dirks and Ferrin's (2001) argument, trust represents the experiences and knowledge about an athlete's teammate. Consequently, trust will affect how an athlete assesses the future behavior of a teammate and how he or she interprets the actions of a teammate. Their first of two propositions is that trust will moderate the relationship between motivational constructs and outcomes such as performance. This is based on the idea that trust can impact performance but does not directly cause one to perform or behave in a certain manner. Evidence consistent with this proposition included a study that found no main effect between trust and performance but

found a moderating effect of trust between group members' motivation and group processes and outcomes (Dirks, 1999).

A second proposition made by Dirks and Ferrin (2001) states that trust will moderate the relationship between a teammate's action and the truster's (athlete) response. In other words, trust can affect how one interprets another person's actions. Consequently, if an athlete has high levels of trust towards a teammate, he or she is more likely to interpret the teammate's behavior favorably than if there were low levels of trust.

The evidence that was presented in support for both propositions stemmed from an array of situations and settings, including both field and experimental studies. The consistency in results across these settings show potential in both propositions to provide an integrative understanding of how trust operates thus future research is needed.

A more recent study by Shen and Chen (2007) examined team trust, leadership, and team performance in both service and manufacturing industries. The authors define team trust as "a dynamic concept which describes faith in or positive expectations for the thoughts, words and actions of others and the willingness to rely on others and take risks, and signifies the existence of team-to-individual and individual-to-team interdependence" (Shen & Chen, 2007, p.644). Questionnaires measuring each of the variables were sent to companies in both these industries and results indicated that team trust had a positive relationship to team performance (measured by task performance and cooperation satisfaction). However the significant relationship only occurred between relational trust (most similar to interpersonal trust which is the focus of this dissertation) and team performance in service based industries. Team trust was also found to be significantly related to team leadership style. That is a concerned type of leadership was

significantly related to relational trust in both industries. Lastly, an equation model showed that team trust was an intervening variable between leadership and team performance.

Also examining trust, leadership and team performance, Dirks (2000) used collegiate basketball teams as his study sample. The purpose of this study was first to examine the assumption that a team's trust in its leader has a significant effect on the team's performance, and second, was to examine the more complex mediating properties of trust in the leader on post and future team performance. Using survey and archival data from Division I and Division III NCAA basketball teams, results indicated that trust in the leader was in fact significantly related to team performance. Results also indicated that trust in teammates was not significantly related to team performance when controlling for other confounding variables (i.e., prior performance, trust in leader, and team talent). This is in line with research previously mentioned in this dissertation that trust in teammates or partners does not have a direct effect on performance. Trust in teammates may play more of a moderating role with other variables and their effect on team performance. Support was also found for the mediating role of trust in the leader between past and future performances. The author states that one of the reasons that the inertia in team performance can be maintained is because past performance affects the trust a team has in its leader, which then affects team performance.

An interesting extension to his line of trust research, Dirks and his colleague Skarlicki (2009) most recently examined the relationship between being perceived as trustworthy by others and its effect on individual performance. To examine this relationship, the authors used social exchange theory (Blau, 1964) as a framework, which states that individuals take part in exchange relationships because they expect that they can gain benefits over time. Using both a field and laboratory study, they found that being seen as trustworthy by coworkers was positively related

to the trustee's performance. In the field study, the interaction between a coworker's perceptions of an individual's capability and integrity predicted his or her performance. That is, perceptions of capability were more positively related to performance when the individual was viewed as high in integrity. The laboratory study further explored these results via social exchange theory. Results from this study confirmed the results from the first (i.e., field study). Furthermore, the results from the second study suggested that trust mediates the effect of the capability and integrity on an individual's willingness to provide resources to a coworker. This demonstrates that trust is an underlying mechanism in this relationship.

As I have mentioned previously in this chapter and Chapter one, very little research has been conducted in the sport domain examining the construct of trust. Other than Dirks' (2000) aforementioned study in NCAA basketball, no other study has really examined teammate trust as a group dynamic construct. Past studies have compared trusting behaviors between starters and non-starters in youth basketball behaviors (McGowan & McGowan, 1991) without really describing what "trusting" means; other studies have examined the development of general interpersonal trust through athletic participation (Clark & Gronbech, 1987) where trust was measured using the "trust fall" often used in team or trust building exercises. Trust in this instance is not specifically direct towards your teammates in the performance domain. Another way researchers have examined variants of trust in the sport domain is through the relationship between participants and organizations. For example, Lynch, Jonson, and Dibbeen (2007) examined trust in adventure racing. More specifically, their study examined trust in event organizers using a criminal case in adventure racing where the death of a participant was determined the responsibility of the event organizers as the main example.

As a whole, teammate trust in the sport domain has attracted very little research attention, and yet, in other comparable domains (e.g. organizational settings), has been extensively studied. Moreover, in such settings, trust has been found to be an important factor in team performance. This dissertation aims to further the trust literature in the sport and athletic context.

Chapter 3

Method

Participants

Girls club volleyball teams from Michigan, northern Indiana, and the Chicago area were contacted for recruitment in the study (approximately 30 clubs ranging from 1 to 30 teams each), 18 of who agreed to participate in the study. Two of the 18 teams completed only two time points of the study, but due to the nature of the analysis all 18 teams were used in the study and subsequent analyses.

The participants in this study were athletes ($N = 180$) and their head coaches ($N = 18$) from the recruited teams. Teams competed in age groups ranging from U14 to U18 (U14 = 3, U15 = 1; U16 = 5, U17 = 5, U18 = 4). An ANOVA was run to determine if there were significant differences between each age group in the study's variables and no significant differences were found. Athletes ranged in age from 12 to 18 years ($M = 15.27$, $SD = 1.38$), were members of their respective teams for 0 to 5 years ($M = .93$, $SD = .72$), and had played competitive volleyball starting from the age of 7 to 16 years ($M = 11.75$, $SD = 1.62$).

Athletes competed in either a Winter season (January – March), Spring season (April – June) or with teams that stayed intact for the entirety of both seasons. An ANOVA was run to verify if the season in which the team competed produced any significant differences in the study's variables. No significant differences were found.

Measures

Demographics. A brief demographic questionnaire was administered at Time 1 of the study and included basic demographic questions such as age, height, usual position played on the court, starting status, volleyball playing experience (measured by number of years playing the

sport), the length of time the participants have been playing with their team and teammates, and if they play volleyball year round (see Appendix A).

Self-efficacy. A non-hierarchical teammate efficacy scale was constructed specifically for this study. As per Bandura's (2006) recommendations, experts in volleyball (collegiate-level coaches) were consulted and were instructed to produce a list of items of volleyball defensive sub-skills required by each teammate for the team to be successful. These items were then piloted with current volleyball players to ensure their relevance and the basic understanding of the questionnaire. Specifically for the self-efficacy scale, the instructions told participants to rate their confidence in their own abilities to effectively perform the defensive tasks listed below. This adheres to Bandura's (2006) guideline that efficacy scales should be written in terms of *can do* to properly assess efficacy beliefs. A total of 5 items were generated (see Appendix B) and addressed various defensive volleyball skills (e.g., Pass a tough serve; Defend against a hard driven attack). A Likert-scale ranging from 0% (not at all confident) to 100% (extremely confident) was used as Bandura (2006) argues that the 11-point scale (i.e., 0 to 10) is more sensitive and reliable than scales using fewer categories. Even though arguments have been made towards a narrower response scale (i.e., Myers & Feltz, 2007), the 11-point scale was chosen because of the longitudinal nature of the data. This scale may be more sensitive to changes that occur over the course of the season. The options were changed from percentages to a 0-10 scale at the point of data entry. Percentages were used, as they may be more tangible to young athletes. The internal consistency reliability for the self-efficacy scale was .85 at Time 1, .87 at Time 2, and .92 at Time 3.

Collective efficacy. This scale included the same items and response scale as the self-efficacy scale, but instructed participants to rate their confidence in their team's ability as a

whole to effectively perform the defensive tasks (Appendix B). The internal consistency reliability for the collective efficacy scale was .89 at Time 1, .88 at Time 2, and .94 at Time 3.

Teammate efficacy. This scale also included the same items as the self- and collective efficacy measures. However, the teammate efficacy scale instructed participants to rate their confidence in each one of their teammates' abilities to effectively perform the defensive tasks listed below (see Appendix C). Because teammate efficacy is an individual-level construct about specific teammates, each participant responded to the scale for each one of their teammates. The stem used for the scale was "I believe that my teammate CAN…". The specific teammate in question was listed at the top of the scale. Because items were specific to each teammate, and entered and computed through the use of team matrices, reliability coefficients were not computed.

Teammate trust. The teammate trust measure mirrored the teammate efficacy measure. All items used in the teammate efficacy measure were also included in the teammate trust measure (see Appendix C). However the scale instructed the participants to rate how much they trusted that their teammates would effectively perform the defensive task during competition. The stem used for this scale was "I TRUST that my teammate [name] WILL…" where 0% indicated they did not trust at all and 100% indicated that they completely trusted their teammates in performing the skills listed in the items. Options were also converted to a 0-10-point scale at data entry.

Participants were also asked to answer each of these questions with regards to each individual teammate because trust is a very individualized belief about another person. An athlete may trust each teammate differently, especially depending on the position they play. For example, the skills listed in the measure are skills that all volleyball players have some

experience with, however some athletes, depending on their position, may have more experience performing the skill. This could lead to an increase in ability in the skill and also allow teammates to form more realistic judgments with regards to the skill. Again, because items were specific to each teammate, and entered and computed through the use of team matrices, reliability coefficients were not computed.

Backing-up behavior. In order to begin the exploration of backing-up behaviors in the sport context, a question was constructed to ask participants their agreement with regard to how often the participant feels like she has to back-up or cover more of the court for the teammate in question. To keep consistency with the other scales, an 11-point Likert scale was also used where 0% indicates complete disagreement and 100% indicates complete agreement (Appendix C). Again, these options were converted to a 0-10-point scale at the time of data entry.

Trust in coach. An adaptation to Dirks (2000) Trust in the Leader measure was used to assess trust in the coach. The scale used in this study was reduced to four items to reflect more of the performance and competence factors of trust in a coach, and therefore did not include the more personal items from the original scale (see Appendix D). The items were rated on a 1 to 10-point Likert scale where 0 represented strong disagreement with the statement and 10 represented strong agreement with the statement. A confirmatory factor analysis supported the one-factor structure at each of the three time points (Time 1: $\chi^2 = 3.76$, CFI = .99, RMSEA = .08; Time 2: $\chi^2 = 1.53$, CFI = 1.00, RMSEA = .00; Time 3: $\chi^2 = 9.32$, CFI = .98, RMSEA = .17). It should be noted that even though the RMSEA was not ideal for Time 3, the chi-square and CFI still indicated an acceptable model fit. Internal consistency reliabilities were .69 for Time 1, .87 at Time 2, and .87 at Time 3.

Team attributions. Greenlees, Lane, Thelwell, Holder, & Hobson's (2005) Causal Dimension Scale for Teams (CDS-T) was used for the assessment of team-referent causal attributions in this study (see Appendix E). The CDS-T comprises of 16 items, divided into four subscales, addressing the participant's perceived main cause for the team's performance. The four subscales include Locus of Causality (items 1, 6, 9, and 13), Stability (items 3, 7, 11, and 15), Team Controllability (items 2, 4, 10, and 14), and External Controllability (items 5, 8, 12, and 16). Each item was rated on a 9-point Likert scale (ranging from 1 to 9) where higher scores are anchored by statements reflecting more internal (e.g. "Caused by an aspect of your team"), more stable (e.g. "Permanent"), more team controllable (e.g. "Your team can control"), and more externally controllable (e.g. "Controllable by people outside your team") attributions. Consequently, lower scores are anchored by statements reflecting less internal (e.g. "Caused by an aspect of the situation"), less stable (e.g. "Temporary"), less team controllable (e.g. "Your team cannot control), and less externally controllable (e.g. "Over which no-one has control") attributions. For the purpose of this study, and the age of the study's participants, small modifications in the wording of some items were changed in order to assure comprehension of the questions. For example, the word "varies" was replaced with "changes", and "regulate" was replaced with " adjust." The internal consistency reliabilities for Locus of Causality were .71 at Time 1, .79 at Time 2, and .81 at Time 3. For Team Controllability, the internal consistency reliabilities were .77 at Time 1, .92 at Time 2, and .90 at Time 3. The internal consistency reliabilities for Stability were .83 at Time 1, and .82 at both Time 2 and 3. Lastly, the internal consistency reliabilities for External Controllability were .72 at Time 1, .75 at Time 2 and .78 at Time 3.

Performance. Performance was measured both subjectively and objectively for this study. The subjective performance measure was included in Greenless and colleagues' (2005) CDS-T where athletes were asked to indicate how they felt their team had performed so far this season. Subjective performance was measured using a 5-point Likert scale ranging from 0 (not well at all) to 4 (very well). Objective performance was measured using 4 indices. First as the team's match winning percentage calculated by dividing the number of match wins by the number of matches played. Second, because each match could include 2-3 games, the game winning percentage was also calculated as a performance index. Third, mean point differential was also calculated by subtracting the number of points scored against from the number of points scored for and calculating the mean across each game. Lastly, because this study focuses solely on the defensive aspects of volleyball, the total points scored against each team were obtained. Wins and losses are absolute measures of team performance and therefore may not be the best indicator of team performance. A team may have won a game but still had 20 points scored against them versus another game where they only had 5 points scored against them. This example demonstrates that even though the team won both games, their defensive performance in each may have been quite different. The win/loss records and scores for each team were obtained from an online scoring website and from the coach when online scores were not available.

Bivariate correlations for all performance indices, at all time points were computed to ensure each index was distinct from each other. Even though some performance indices were highly correlated at one time point (e.g., mean points scores against and mean point differential at Time 0, $r = -.972$), the high correlations were not consistent across time points (e.g., mean

points scores against and mean point differential at Time 3, r = -.619). Consequently, all five performance indices were kept and used in subsequent analyses.

Coach rankings. In an attempt to verify the accuracy of the teammate efficacy and teammate trust measures, coaches were asked to complete rankings for each of the defensive skills used in the efficacy and trust measures for each of their athletes. Coaches were asked to list in order, from most effective to least effective, each player for each defensive skill. Lastly, coaches were asked to also indicate three athletes from the team who would be characterized as the "go to" girls whom the coach could count on in a very crucial game situation (Appendix F).

Bivariate correlations were computed between coach rankings and teammate efficacy at all time points. Results indicated a significant negative relationship for all correlations (Time 1: r = -.572, p< .0001; Time 2: r = -.630, p<.0001; Time 3: r = -.548, p<.0001) indicating that lower rankings (represented by higher numbers) were significantly related to lower ratings of teammate efficacy (represented by lower numbers).

Procedure

Permission to conduct this study was obtained from the Institutional Review Board for Human Subject Research. Following approval, volleyball club directors were contacted via email inviting the teams from their club to participate in the study. A brief description of the study and procedures were provided in the initial email. Once directors agreed to have their clubs participate, coaches were invited to have their team participate. With the invitation from the club director, the researcher also attended club coach meetings and other club functions to invite coaches from each club to participate. Again, a brief description of the study and procedures were provided. Once coaches agreed to participate, parental informed consent forms were sent to

the athletes' parents. Because the teammate measures required team members' names, coaches were asked to provide a team roster.

Data collection involved three time points where Time 1 data were collected around the beginning of the competitive season, Time 2 data were collected around the mid-point of the season, and Time 3 data were collected around the end of the season. Due to the briefness of some teams' seasons, it was ensured that at least one tournament was played between each time point. In addition, no matter how long a team's season was, the interval of time between each data collection point remained consistent within each team. Three time points were included to account for the fact that at the beginning of the season, teammates may not be familiar with each other's abilities thus requiring each athlete to make assumptions with regard to each others' and the team's ability. Furthermore, trust beliefs of teammate may be conservative or inflated at the beginning of the season; therefore, it is important to have measuring points at different times of the season (McKnight, Cummings, & Chervany, 1998). Collecting data at three time points also allowed for the examination of the potential development of teammate efficacy, and teammate trust within each team. Because these constructs are dynamic yet often becoming more stable towards the end of the season once the athletes become familiar with each other (Jung & Sosik, 2003), it is most beneficial to examine the data at multiple time points. Questionnaires were administered at practice and not immediately before or after a competition so that competition-specific responses were avoided.

Once parental consent was obtained for all athletes, Time 1 data collection was scheduled with the coach at a regular practice time. It should be noted that only two athletes (from the same team) did not have parental consent forms and therefore did not participate in the study. At Time 1, athletes completed informed assent forms and were administered demographics, self-,

collective, and teammate efficacy measures as well as teammate trust, backing-up behavior, trust in the coach questionnaires, and a causal attribution scale for teams. Time 2 and Time 3 included all measures except the demographics. If a team member did not attend the practice when the questionnaires were being administered, a questionnaire packet, instructions, and a stamped and addressed envelope were left with the coach. The coach was instructed to provide the information to the team member, have them complete the measure on their own, insert and seal it in the envelope and return it to the researcher by postal mail. Participants were guaranteed confidentiality of their responses and were instructed to complete the questionnaires individually without conversing with teammates. Coaches also signed consent forms and completed coach rankings at each time point.

Team performance scores were gathered through online resources or by email from the coach. Objective performance scores were gathered at up to 4 time points. If teams had already played prior to Time 1 data collection, this performance was considered at Time 0. Each subsequent performance scores were numbered the same as the data collection time occurring prior to the performance. For example, a team who played matches before the first data collection time and also after the last data collection time, had a data collection pattern as follows: Time 0 performance – Time 1 data – Time 1 performance – Time 2 data – Time 2 performance – Time 3 data – Time 3 performance. Once the data were collected, data files for each team were constructed, including team matrices for teammate efficacy, teammate trust, and backing-up behavior.

Data Analyses

Prior to any analysis, team matrices were constructed for the teammate efficacy, teammate trust, and backing-up variables. Athletes were removed from the matrices if they

showed response bias where they simply circled the same number for each question for each teammate. Matrix means were then calculated for each and entered into the team level data file. Means for each variable were computed for each athlete to represent each athlete's evaluation of each teammate.

Descriptive statistics (i.e., mean, standard deviations) were calculated for all variables. Demographic variable descriptive statistics were calculated at the individual level, while all other variable descriptive statistics were calculated at both the individual and team level. Bivariate correlations were calculated between teammate efficacy and teammate trust at both the individual and team level at each of the three time points. Bivariate correlations were also calculated between self-efficacy, collective efficacy, teammate efficacy, and teammate trust at both the team level (at all three time points) and between team level (testing Hypothesis 1). Bivariate correlations were then calculated between all five performance measures (i.e., subjective performance, match winning percentage, game winning percentage, mean points scored against, and mean point differential) at the team level for each time point. Lastly, bivariate correlations were calculated between mean coach rankings for each of the five defensive skills and teammate efficacy mean scores for each athlete, at each of the three time points. One-way ANOVAs by team age group and by season (i.e., Winter season, Spring season, combined season) were then calculated for each variable at each time point. Internal consistency reliabilities were computed for scales that had multiple items and confirmatory factor analyses were computed for the Trust in Coach scale as well as for the Causal Dimension Scale for Teams (CDS-T) (Greenless et al., 2005).

Due to the nested and longitudinal nature of the data, multilevel modeling was used where Level 1 represented differences within teams over time and Level 2 represented

differences between teams. Multilevel statistical techniques such as hierarchical linear modeling (HLM) account for the interdependence of the data and allow researchers to simultaneously examine relationships at each level and across levels, while determining the amount of variation at each level (Raudenbush & Bryk, 2002). The first step of model building involved imposing an unconditional model where no individual, subgroup, or team level predictors were entered into the model. The purpose of fitting the unconditional model was to determine the amount of variation in the dependent variable to ensure HLM is an appropriate form of analysis. HLM was used to test Hypothesis 2 where separate analyses were run for each performance measure. Teammate efficacy, collective efficacy, trust in coach, and past performance (when available) were entered as predictors at both Level 1 (within teams) and Level 2 (between teams). Because of the preliminary results, Hypothesis 3 could not be tested (see Results chapter). HLM was also used to test Hypothesis 4 where backing-up behavior was entered as the dependent variable and teammate trust and collective efficacy were entered as predictors at both Level 1 and Level 2.

Bivariate correlations were calculated to answer Research Question 1 where self-efficacy, collective efficacy, teammate efficacy, and teammate trust were examined at each of the three time points. Lastly, HLM was also used to answer Research Question 2 where each of the four dimension of causal attributions in teams were entered as the dependent variable in separate analyses and time, teammate trust, trust in the coach, and subjective performance as predictors at both Level 1 and Level 2.

Chapter 4

Results

Descriptives

Descriptive statistics for the athletes are presented in Table 1. Means and standard deviations for team level variables are presented in Table 2. In terms of performance, teams rated themselves as having performed "so-so" to "well" over the course of the season with scores ranging from 1.50 to 3.57[1]. The objective performance scores ranged from 0% to 100% for both the match and game winning percentage; 13.00 points to 26.31 points for mean points scored against; and -23.00 points to 10.83 points for mean point differential. Teams tended to have moderately high aggregated self-efficacy beliefs in their defensive volleyball skills with scores ranging from 6.08 to 9.04 as well as moderate to high aggregated collective efficacy beliefs in the team's defensive volleyball skills with scores ranging from 5.73 to 9.20. Teammate efficacy scores and teammate trust scores showed similar patterns with scores ranging from 5.51 to 9.13 and 5.27 to 9.42 respectively. Teams showed high levels of trust in their coach with scores ranging from 5.91 to 9.89 and teams did not seem to feel as though they needed to back up their teammates often with scores ranging from .83 to 4.61. With regard to team attribution dimensions, teams tended to attribute their performances to more internal, more team controllable, less stable, and less externally controllable factors where scores ranged from 5.28 to 8.36 for Locus of Causality, 6.11 to 8.56 for Team Controllability, 2.25 to 6.25 for Stability, and 2.19 to 5.44 for External Controllability.

Tables 3 and 4 show the bivariate correlations between aggregated self-efficacy, aggregated collective efficacy, teammate efficacy, and teammate trust at the team (within) level

[1] All score ranges include scores across all time points within the mentioned variable.

and between level, respectively. Pearson Product Moment correlations showed at the between team level significant relationships between teammate efficacy and teammate trust (r = .955), teammate efficacy and collective efficacy (r = .72), collective efficacy and self-efficacy (r = .56), and collective efficacy and teammate trust (r = .71). At the within team level (i.e., across time), Pearson Product Moment correlations revealed interesting results. The relationship between teammate efficacy and collective efficacy became stronger as the season progressed (Time 1: r = .40; Time 2: r = .63; Time 3: r = .90). Not surprisingly since the relationship between teammate trust and teammate efficacy was so strong, the same pattern emerged between teammate trust and collective efficacy (Time 1: r = .39; Time 2: r = .69; Time 3: r = .89). Lastly, the same pattern also emerged in the relationship between self-efficacy and collective efficacy (Time 1: r = .29; Time 2: r = .66; Time 3: r = .76).

Table 5, Table 6, and Table 7 show the correlations at each Time 1, Time 2, and Time 3, respectively, between collective efficacy, teammate efficacy, teammate trust and performance indices before and after each time point. Of note, there are no significant relationships between collective efficacy and performance, nor are there any significant relationships between teammate efficacy (or teammate trust) and performance. Table 8 shows the same correlations at the between team level. Results show the same non-significance.

Hypothesis Testing

The correlational results provided partial support for Hypothesis 1 that collective efficacy and teammate efficacy would be positively related to each other but remain two distinct variables (show no multicollinearity). At the between team level, teammate efficacy and collective efficacy had a moderately strong positive relationship. However, at the within team level at Time

1 the relationship was non-significant, at Time 2 the relationship was moderately positive, and at Time 3 the relationship was so strong and positive that it would suggest multicollinearity.

Multiple linear regression and HLM were used to test Hypothesis 2: Teammate efficacy is a significant predictor of team performance while controlling for collective efficacy, trust in the coach, and past performance. Because subjective performance was assessed at the same time points as the predictor variables and asked participants to evaluate the team's performance so far during their competitive season, teams only evaluated their performance at three time points. In addition, because subjective performance is an outcome variable, only performance evaluations at Time 2 data collection (Time 1 performance) and at Time 3 data collection (Time 2 performance) could be inserted into a regression model. Consequently, multiple linear regression was used to test Hypothesis 2 for subjective performance as HLM is not appropriate for longitudinal data with less than three time points. In the first regression model, subjective performance Time 1 (the team's performance between the first and second data collection sessions) was entered as the outcome variable. Subjective performance Time 0 (the team's performance prior to the first data collection session), aggregated collective efficacy at Time 1, teammate efficacy at Time 1, and trust in the coach at Time 1 were entered as predictors. The model was not significant. For the second regression model, subjective performance Time 2 (the team's performance between the second and third data collection sessions) was entered as the outcome variable. Subjective performance Time 1, aggregated collective efficacy at Time 2, teammate efficacy at Time 2, and trust in the coach at Time 2 were entered as predictors. Once again, the model was not significant.

Similar to the multilevel analysis procedures described in the data analyses section of Chapter 3, an unconditional model was run with the remaining four performance measures. The

unconditional models (i.e. variance components) for both the match winning percentage and game winning percentage were non-significant indicating that HLM was not an appropriate form of analysis, therefore both forms of performance measures were removed from any further analysis.

The unconditional model for the mean points scored against indicated that 31.6% of the variance was due to between-team differences and was significant ($\chi^2 = 38.20$, $p < .01$). Mean points scored against was entered as the outcome variable and collective efficacy, teammate efficacy, trust in the coach, and past performance (as a control variable) were entered and grand mean centered at both Level 1 and Level 2. Time was also entered in this model as a Level 1 predictor. Individual level data (i.e., age) were not entered in the models because all other variables were analyzed at the team level (within teams over time). Table 9 presents the results of this model where the only significant predictor of means points scored against was past performance ($\beta = .71$, $p < .01$). Table 10 presents the percentage of variance accounted for at the within and between levels. For mean points scored against, the percentage of variance explained was 9% at the within level and 1.4% at the between level. Adjusting for the within-team (i.e., 1 – ICC) and between-team (i.e., ICC) variance, the percentage of total variance accounted for was 6.6% in mean points scored against (within level = 6.2%, between level = -.4%). It should be noted that because the variance of both within- and between-level predictors was smaller than just the within-level predictors alone at the within level, Snijders & Bosker's (1999) adjusted formula was used to calculate the percentage of variance accounted for using a mean number of team members (9 athletes).

The unconditional model for the mean point differential indicated that 24.5% of the variance was due to between-team differences and was significant ($\chi^2 = 32.65$, $p < .05$). Mean

point differential was entered as the outcome variable and collective efficacy, teammate efficacy, trust in the coach, and past performance were entered and grand mean centered at both Level 1 and Level 2. Time was once again entered as a Level 1 predictor. Table 11 presents the results of this model where no significant predictors were found. Thus, Hypothesis 2 was not supported. Table 12 presents the percentage of variance accounted for at the within and between levels. For mean points scored against, the percentage of variance explained was 3.5% at the within level and 1.2% at the between level. Adjusting for the within-team (i.e., 1 – ICC) and between-team (i.e., ICC) variance, the percentage of total variance accounted for was 2.9% in mean point differential (within level = 2.6%, between level = .3%). It should again be noted that because the variance of both within- and between-level predictors was smaller than just the within-level predictors alone at the within level, Snijders & Bosker's (1999) adjusted formula was again used to calculate the percentage of variance accounted for using a mean number of 9 team members.

Hypothesis 3 stated that teammate trust would moderate the relationship between teammate efficacy and team performance. Due to the very strong positive relationship between teammate trust and teammate efficacy (r = .95, p< .0001), this hypothesis could not be statistically tested as the correlation coefficient indicates multicollinearity.

HLM was again used to test Hypothesis 4, which stated that teammate trust would negatively predict feelings of having to back-up or cover for teammates while accounting for collective efficacy. The unconditional model for backing-up behaviors indicated that 69.9% of the variance was due to between-team differences and was significant (χ^2 = 134.17, p < .001). Backing-up behavior was entered as the outcome variable and teammate trust and collective efficacy were entered as predictors at both Level 1 and Level 2, and Time was entered only at Level 1 as a predictor. Table 13 presents the results of this model where teammate trust was a

significant predictor at the within team level (β = -.93, p < .01). No other predictors were found to be significant therefore providing support for Hypothesis 4. Table 14 presents the percentage of variance accounted for at the within and between levels. For backing-up behaviors, the percentage of variance explained was 50% at the within level and 3.8% at the between level. Adjusting for the within-team (i.e., 1 – ICC) and between-team (i.e., ICC) variance, the percentage of total variance accounted for was 17.7% in backing-up behaviors (within level = 15%, between level = 2.7%).

With regards to the research questions posed in this study, some interesting results were found. The first question asked if there were differences in the relationships between efficacy (self-, collective, and teammate) and trust over time. Table 3 presents the bivariate correlations of each of these variables at all three time points. As mentioned earlier in this chapter, a number of these relationships strengthened over the competitive season. Of note, and as presented previously, the relationship between teammate efficacy and collective efficacy became stronger as the season progressed (Time 1: r = .40; Time 2: r = .63; Time 3: r = .90) as did the relationship between teammate trust and collective efficacy (Time 1: r = .39; Time 2: r = .69; Time 3: r = .89).

Lastly, to answer Research Question 2 (Do teammate trust and/or trust in the coach have an effect on team attributions while accounting for subjective performance?), HLM was used by running a 2-level model for each of the four team causal dimensions. The unconditional models for each of the dimensions were significant: Locus of Causality (χ^2 = 27.52, p = .05), Team Controllability (χ^2 = 27.35, p = .05), Stability (χ^2 = 64.12, p < .001), External Controllability (χ^2 = 48.50, p < .001). The unconditional models also indicated that 18.1% of the variance was due to between-team differences for Locus of Causality, 17.7% for Team Controllability, 49.8% for

Stability, and 39.2% for External Controllability. Each team causal dimension was entered in its own model as the outcome variable. Teammate trust, trust in the coach, and subjective performance were added as predictors at both Level 1 and Level 2 for each of the four models. Time was also added as a Level 1 predictor for each of the four models. The team controllability and external controllability models were not significant. The model for Locus of Causality was also non-significant however, trust in the coach approached significance at Level 1 (β = .35, p = .087). The model for Stability was significant. Table 15 presents the results of this model where trust in the coach was a significant predictor at Level 2 (β = -.86, $p < .05$), indicating that higher levels of trust in the coach predicted less stable team attributions. No other predictors were found to be significant. Table 16 presents the percentage of variance accounted for at the within and between levels. For stability, the percentage of variance explained was 29.5% at the within level and 20.5% at the between level. Adjusting for the within-team (i.e., 1 – ICC) and between-team (i.e., ICC) variance, the percentage of total variance accounted for was 25% in stability (within level = 14.8%, between level = 10.2%).

Summary of Hypotheses and Results

Hypothesis 1 addressed the relationship between collective and teammate efficacy. Partial support was provided for this hypothesis as the between level correlation was moderately strong and significant, however over time, the strength of the relationship increased from non-significant to multicollinear. Hypothesis 2 examined the predictive strength of teammate efficacy on team performance while controlling for collective efficacy, trust in the coach and past performance. Hypothesis 2 was not supported. Hypothesis 3 posited that teammate trust would moderate the relationship between teammate efficacy and team performance. This hypothesis could not be tested, and is therefore not supported, because of the multicollinearity between

teammate efficacy and teammate trust, as well as the non-significant prediction of teammate efficacy of team performance. Hypothesis 4 posited that teammate trust would negatively predict feelings of having to back-up teammates while controlling for collective efficacy. Support for Hypothesis 4 was found. Research Question 1 was examined and it does seem that there are differences in the relationships between efficacy and trust over the course of a competitive season. Lastly, teammate trust and trust in the coach did not seem to have much effect on team attributions, except for the causal dimension of stability.

Chapter 5

Discussion

Even though confidence and trust in one's teammates is fairly common in anecdotal counts of sport teams, it has rarely been studied in the sport context. To address this gap in the research, this dissertation examined the constructs of teammate efficacy, its relationship to self-efficacy, collective efficacy and team performance. Furthermore this study aimed to examine teammate trust as a potential moderator between teammate efficacy and team performance. Findings from this study contribute to a better understanding of these constructs in the sporting arena and offer a starting point for future research in this area. This chapter discusses the findings of this dissertation, discusses strengths and limitations of the study, identifies implications of these results, and presents future research directions.

Results showed that the relationship between collective efficacy and teammate efficacy became stronger over the course of a competitive season. Teammate efficacy and collective efficacy were not found to be significant predictors of team performance. Teammate efficacy and teammate trust were highly correlated (i.e., showed multicollinearity) and therefore a moderating relationship between these variables to predict team performance was not tested. Results also showed that decreased teammate trust significantly predicted increased feelings of having to back-up or cover for teammates while accounting for collective efficacy. Lastly, no variables of trust were found to significantly predict team attributions.

Teammate trust, along with teammate efficacy were the focal points of this study and following Dirks and Ferrin's (2001) propositions, it was hypothesized that there would be a moderating relationship between the two. Consequently, it would be assumed that these variables would be distinct from one another. However, the results did not demonstrate this. Teammate

efficacy and teammate trust were so highly correlated that there was no statistical distinction between the two. This was possibly due to the age group of the participants. Because of the mean age of the participants being around 15 years, conceptually distinguishing between teammate efficacy and teammate trust may be difficult. Efforts were made through written and oral instructions and definitions to explain the difference between the two variables however having the participants respond to similar questions for each variable may have confused them. It should be noted, however, that even though the two were very highly correlated, and the magnitudes of both were similar, teammate trust was slightly less than teammate efficacy at all three time points (see Table 1). Past research on efficacy beliefs in sport has mostly yielded high levels of efficacy beliefs with athletes rarely using the lower half of the response scale (Feltz & Chase, 1998). Myers and Feltz (2007) have argued that the psychometric functioning of collective efficacy scales could be improved if the rating categories were reduced because of the sparse responses at the lower end of the scales. Perhaps teammate trust may be a more salient construct with more wide spread response variability than teammate efficacy and should be considered in future research. On the other hand, teammate efficacy and teammate trust may in fact be conceptually very similar. Because the trust measure focused solely on trusting belief-competence and the teammate efficacy and teammate measures were so similar to each other, it is likely that the participants had difficulty discriminating between the two. Consequently, as measured in this study, they measured the same construct. Perhaps if the teammate trust also included the benevolence and integrity features of trust (Mayer, Davis, & Schoorman, 1995), was measured on a different scale, and also was not measured directly following teammate efficacy, a greater level of discriminant validity would occur. Future research should also continue to examine the psychometric properties of each, and examine the conceptual similarities and differences.

Dirks and Ferrin (2001) also stated that evidence supporting a direct relationship between trust and performance was weak and inconsistent. The results from this study seem to support this claim. No significant correlations were found between teammate trust and either of the five performance indices both at the within and between level.

It was somewhat surprising that teammate efficacy was not a significant predictor of any of the team performance measures. Even more surprising that collective efficacy was not a significant predictor of performance either because past research has shown a positive and robust relationship between the two (e.g., Myers, Feltz, & Short, 2004; Myers, Payment, & Feltz, 2004). One could assume that this was due to the small sample size, however studies with similar sample size have shown significant positive relationships (Feltz & Lirgg, 1998). It could also be due to the somewhat stable yet subtle increase in both teammate and collective efficacy across the duration of the season and the fairly unstable performance indices. Teams could be playing more difficult opponents towards the end of the season resulting in a decrease in performance according to the performance indices. However, no significant relationships or predictions were found with subjective performance evaluations, which also showed a slight increase over the course of the season.

Most studies examining the relationship between efficacy beliefs and team performance have been completed using collegiate or older samples. Perhaps adolescents competing at the club level cannot perceive their team's or teammate's abilities as accurately as adults can. Children only begin to distinguish between their own effort and ability in their late childhood years (Nicolls, 1990), therefore the mean age of about 15 years could be indicative of a lack of accurate perceptions. In addition, at the club level, coaches are encouraged to focus on

development and effort, therefore efficacy beliefs may again be slightly inflated as the results may suggest (see Table 2).

Another interesting finding was the change in strength of relationship between collective and teammate efficacy (see Table 3). At the beginning of the season, there was no significant relationship between the two variables, however, as the season progressed, the relationship became quite strong and significant. This may suggest a form of de-individuation on the part of the athletes as the season moves along. For example, when the team comes together at try-outs or within the first week or so of practice, there is more of a sense of 'me and them' (i.e. teammates), therefore collective efficacy and teammate efficacy are two separate entities. However as the season progresses, the sense of "us" grows where the athletes feel more and more as part of the team. It was mentioned in Chapter 1 that Feltz and colleagues (2008) argue that Lent and Lopez (2002) measure other efficacy in the same way as collective efficacy except that it is in dyads rather than teams of three or more members. In addition, because Lent and Lopez's main focus was on dyadic relationships, the differences between the two constructs can be clearer than in larger groups such as sport teams. This proposition is partially supported as the relationship between teammate efficacy and collective efficacy is very high at the end of the competitive season. A second, and realistic reason for these results is that after completing the measures once or twice already, athletes did not take as much care in their responses compared to prior data collection times. Athletes could have been rushing through the items and simply answered each with more consistency than in prior data collection times.

As mentioned in Chapter 1, Dirks and Ferrin's (2001) second proposition was that trust will moderate the relationship between a teammate's action and the truster's response. Therefore trust can have an effect on how athletes interprets their teammate's actions. If an athlete has a

decreased feeling of trust in a teammate, perceptions of this teammate's behaviors should also be low. Consequently, these decreased perceptions could lead to changes in behavior in the truster such as having to back-up or cover for the teammate in question. This proposition led to Hypothesis 4, which was supported. While accounting for collective efficacy, teammate trust in a particular teammate significantly predicted feelings of having to back-up this said teammate; athletes who had decreased levels of trust in their teammate, felt they had to back-up or cover for this teammate.

Very little research has been conducted examining backing-up behaviors, however a handful of studies in the organizational context should be noted. In their first study, Porter, Hollenbeck, Ilgen, Ellis, West and Moon (2003) defined backing up behaviors as "the discretionary provision of resources and task-related effort to another member of one's team that is intended to help that team member obtain the goals as defined by his or her role when it is apparent that the team member is failing to reach those goals" (p. 391-392). This initial study and a follow-up by Porter (2005) found that when there was a mismatch in workloads and team capacities, backing up behaviors were likely to have positive effects on team performance. On the other hand, a more recent study by Barnes, Hollenbeck, Wagner, DeRue, Nahrgang, and Schwind (2008) contended and found that backing-up behavior leads to both initial and subsequent costs to taskwork (i.e., a team's interaction with equipment and the task at hand). More specifically Barnes and colleagues (2008) found that the relationship between backing up behavior and the backup provider's neglected work was moderated by workload distribution where the relationship was stronger when the workload was evenly distributed between team members.

These findings could be extended to the sporting context where backing up a teammate may result in both positive and negative consequences in team performance depending on the workload distribution. For example, if a volleyball player is being targeted at every opponent's serve, the workload is not evenly distributed therefore backing up behaviors from a teammate who is not being targeted may have positive effects on team performance. However, if the workload is evenly distributed and coordination is not at its optimal level, backing up behaviors may indeed have negative consequences on team performance.

Furthermore, Barnes and colleagues (2008) also suggest that backing up behaviors can lead to more long term negative effects such as decreased motivation, dependence, and social loafing from the teammate who is receiving the backing up. They state that individuals who receive high levels of backup from teammates will interpret their own abilities as inadequate and may lead to decrease motivation in future tasks. In addition, when individuals are consistently being backed up they will no longer feel personally accountable for their incomplete tasks. Once more, these findings could be extended to the sporting context and future research should examine these relationships using different sport teams.

Strengths and Limitations

This study examined efficacy and trust beliefs in an adolescent sample across an entire competitive season. The advantages or strengths of a longitudinal design include the ability to examine relationships over time, such as an entire competitive season. Because group dynamics such as efficacy beliefs and trust are in fact *dynamic* but becoming more stable towards the end of the season (Jung & Sosik, 2003), using a longitudinal design allows researchers to identify any changes in variables over the course of a season. Additionally, as mentioned in a previous chapter, trust beliefs of teammate may be conservative or inflated at the beginning of the season

therefore it is important to have measuring points at different times of the season (McKnight, et al., 1998).

Another strength associated with this study pertains to the use of multilevel modeling techniques (e.g. HLM). Due to the nested and longitudinal nature of the data, HLM was used to simultaneously analyze the data and account for the interdependence of the data at each level and across levels, while determining the amount of variation at each level (Raudenbush & Bryk, 2002).

Additionally, this study measured multiple performance indices, using both objective and subjective measures. Often, studies will simply use a team's or athlete's winning percentage as an indicator of performance, or a subjective measure which is subject to response bias. Moreover, in this study winning percentages were not deemed appropriate to use with multilevel modeling. Because this study examined specifically defensive skills in volleyball, more defensive performance indices were also used. It is important to have congruence between efficacy and performance measures in order to ensure a study's validity (Feltz et al., 2008). Future research should consider implying multiple performance measures, both objective and subjective and not simply a team or athlete's winning percentage.

Lastly, no other study in the sport context has examined the construct of trust. Even though anecdotally trust is often mentioned as an important factor leading to peak team performance, it has rarely been examined scientifically. In addition, very little research has been conducted examining the construct of teammate efficacy (i.e. other-efficacy, Lent & Lopez, 2002) outside of the counseling psychology domain. This investigation offers a foundation on which future studies can be based upon to further understand these variables in the sport context.

Although there are several strengths associated with this study, there are also some limitations that should be mentioned. The first limitation in this study is the sample size. Although the number of teams that participated in this 3-time point longitudinal study (N = 18) is somewhat typical for sport psychology research, it was not favorable for statistical purposes. Even though multiple volleyball clubs were contacted and invited to participate (approximately 30 clubs ranging from 1 to 30 teams each), only a small portion of these agreed to participate (i.e., director, coach, parents, and athlete agreement). When a team has a relatively short competitive season (e.g., 3 months), giving up potential practice time to complete surveys was not favorable to many directors and coaches. Large sample sizes are difficult to acquire in group field research because one team may include several members; therefore a sample size of 50 teams may actually include over 500 participants. The small sample size reduces the statistical power in a study and therefore more hypotheses may have been significant had there been a larger sample size. There are no known well-developed techniques or statistical software to determine statistical power or effect sizes for hierarchical linear modeling or multilevel modeling. Consequently, any calculations of these would only be speculation and unreliable. Future studies with larger sample sizes may be better able to test the hypotheses proposed in this dissertation and have the statistical power required to find significant differences.

A second limitation in this study could be the variability in team goals. Even though all teams competed at the club level, it was apparent to the researcher that some teams had set higher goals than others (i.e., attending national championships versus playing well and having fun). Even within teams, coaches, athletes, and teammates could have had different goals for themselves and the team. No measure was taken in this study to account for this variability and

future research should include team goals and/or expectations as a control variable to account for potential confounders.

Another limitation is the proximity of each of the time points for a number of teams. Because some teams participated in relatively short seasons, the amount of time between each data collection session was only 2 weeks while other teams participating in longer seasons had over a month between time points (time intervals were consistent within each team). There were no significant differences in the variables between teams competing in different seasons. However, two weeks could be too short of a time period to show much change or development in efficacy beliefs and trust. Future studies could examine teams that compete in longer seasons and potentially measure each variable at more than three time points during the competitive season.

Implications

This study has shown that levels of trust in teammates significantly predict feelings of having to back-up or cover for teammates. That is, if an athlete has lower levels of trust in a teammate, she feels that she must cover or back-up this teammate. For example, if a volleyball player does not trust a teammate to effectively play a serve from her opponent, she may move out of her own position to cover more space from her teammate. As mentioned previously, the consequence of this change in position could be positive or negative depending on the workload of the backup provider and the communication and coordination skills of the team (Barnes et al., 2008). Coaches should address these issues with their team and make it clear with their athletes when providing backup for teammates is most beneficial. Because there may be long-term consequences with providing backup (e.g. dependency and lack of accountability), coaches and athletes should continuously remind their team what every person's role is and the importance of each teammate fulfilling the role to the best of her ability.

Future Directions

Because this study is the first to examine teammate efficacy, teammate trust and backing up behaviors in sport, there are several directions that could be followed and investigated in future studies. First, because the sample used in the current study was quite specific, future research should examine similar research questions in different samples. As previously mentioned, the mean age of the current participants was just above 15 years of age, which could have contributed to an inability to differentiate between efficacy and trust. Future research should examine any differences between these constructs in more mature samples.

Qualitative methods such as interviews and focus groups with athletes and coaches may also give more insight on perceptions of each of these constructs. Interviews conducted with athletes and coaches could serve as a better means to explore the differences between efficacy and trust or if these differences even exist. These methods can provide an answer to the "why" questions in this area of research as well as dig deeper into the meaning of trust, its development and consequences in sport teams. In addition, due to the difficulties in measurement, qualitative methods may also be helpful in examining the effect of backing up behaviors on team performance.

Past research mentioned in this dissertation (Dirks, 2000) found that trust in the leader or coach plays a significant part in team performance. Examining this aspect of trust in sport team dynamics is also an area of future research. The data from this study showed that trust in the coach decreased over the course of the season. Future studies could examine why this may happen and if this phenomena is true in different age groups where coaches are not just volunteer parents, but have multi-million dollar contracts.

Another line of research stemming from this initial study could be the examination of trust and performance in terms of different team roles. For example, is it more important (in terms of performance) to trust your goaltender than a fourth line forward in ice hockey? Some team roles have a greater effect on the team's outcome therefore trusting the teammates in these specific roles may have a greater effect on collective efficacy, team cohesion, and team performance.

Until now, backing up behaviors have been studied in an experimental setting. Although complex, future research could begin to investigate how one could measure backing up behaviors in a field setting. Observational techniques and evaluation of the coach and teammates could provide insight into how, and when it is mostly likely that an athlete provides backup for his or her teammate. Once appropriate assessment and measurement techniques are validated, more complex research designs and hypotheses can be examined and tested.

Lastly, additional group dynamic variables can be compared with teammate trust in future research thus leading to the development of a model of trust in team sport. Antecedents such as team interdependence, team goal orientation (e.g. Porter, 2005), communication, cohesion, coordination, playing experience, and past performance could be tested as sources of trust in teams. Consequences or outputs of teammate trust could include performance, enjoyment, cohesion, commitment, and coordination. There is plenty of anecdotal evidence from athletes that demonstrates the perceived importance of trust in team sport, however it has not received empirical attention. The opportunities for future research in this area are subsequently abundant.

Conclusion

This study examined the constructs of teammate efficacy, its relationship to self-efficacy, collective efficacy and team performance. Measures of efficacy belief, trust, and performance were gathered from girls club volleyball teams at three time points across a competitive season. Results showed that teammate efficacy and teammate trust were too statistically similar to differentiate. Results also showed that teammate efficacy did not predict team performance. However, decreased levels of teammate trust led to increased feelings of having to provide backup for teammates. Findings from this study contribute to a better understanding of these constructs in the sporting arena and offer a starting point for future research in this area.

TABLES

Table 1

Athlete Demographics

Variable	Mean	SD
Age	15.29	1.42
Height	66.34 inches	2.94
Starting status*	2.97	1.00
Age when began playing competitively	11.74	1.62
Number of seasons with team	.93	.72

*Athletes were asked to choose one option: Never = 0, Not a whole lot = 1, About half the time = 2, A lot of the time = 3, Always = 4

Table 2

Means and Standard Variations for Team Variables (N = 18)

Variable	Time 0		Time 1		Time 2		Time 3	
	M	SD	M	SD	M	SD	M	SD
Subjective performance	2.50	.50	2.72	.51	2.84	.56	-	-
Match winning %	37.48	39.32	44.91	28.22	41.99	30.91	48.71	27.46
Game winning %	32.73	32.16	45.74	23.98	37.27	27.23	50.86	23.28
Mean pts scored against	21.62	2.82	20.45	2.78	21.86	2.59	21.82	5.01
Mean point differential	-.06	5.41	-.31	4.70	-3.03	7.08	.47	5.16
Aggregated self-efficacy	-	-	7.22	.51	7.56	.61	8.02	.63
Aggregated collective efficacy	-	-	6.85	.54	7.41	.57	7.82	.67
Teammate efficacy	-	-	7.02	.52	7.18	.52	7.49	.71
Teammate trust	-	-	6.72	.50	7.03	.59	7.34	.81
Trust in coach	-	-	8.97	.46	8.54	1.05	8.55	1.20
Backing-up	-	-	2.99	.78	2.96	.81	2.60	.94
CDS – T: Locus of Causality	-	-	6.96	.58	6.85	.73	7.21	.58
CDS – T: Team Controllable	-	-	7.53	.49	7.18	.67	7.50	.57
CDS – Team: Stability	-	-	3.79	1.05	4.01	.86	4.32	.82
CDS – Team: External Controllable	-	-	3.86	.59	4.10	.68	3.95	.71

Table 3

Team Level Bivariate Correlations Between Aggregated Self-Efficacy (SE), Aggregated Collective Efficacy (CE), Teammate Efficacy (TE) and Teammate Trust (TT).

Variables	1	2	3	4	5	6	7	8	9	10	11
1. Time 1 SE											
2. Time 2 SE	.78**										
3. Time 3 SE	.56*	.68*									
4. Time 1 CE	.29	.27	.44								
5. Time 2 CE	.38	.66**	.59*	.58*							
6. Time 3 CE	.11	.32	.76**	.49	.68**						
7. Time 1 TE	.35	.68**	.75**	.40	.64**	.63**					
8. Time 2 TE	.13	.51*	.69**	.37	.63**	.74**	.83**				
9. Time 3 TE	-.02	.28	.70**	.47	.55*	.90**	.72**	.84**			
10. Time 1 TT	.32	.57*	.76**	.39	.62**	.64**	.93**	.77**	.67**		
11. Time 2 TT	-.19	.39	.63**	.27	.69**	.80**	.73**	.93**	.84**	.75**	
12. Time 3 TT	-.85	.22	.69**	.39	.52*	.89**	.64**	.78**	.97**	.65**	.84**

Note. ** p< .01; * p< .05

Table 4

Between Level Bivariate Correlations Between Aggregated Self-Efficacy (SE), Aggregated Collective Efficacy (CE), Teammate Efficacy (TE) and Teammate Trust (TT).

Variables	1	2	3	4
1. Aggregated Self-Efficacy				
2. Aggregated Collective Efficacy	.56*			
3. Teammate Efficacy	.52*	.72**		
4. Teammate Trust	.44	.71**	.95*	

Note. ** p< .01; * p< .05

Table 5

Correlations at Time 1 Between Collective Efficacy (CE), Teammate Efficacy (TE), Teammate Trust (TT), and Pre- and Post-Performance Measures.

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. CE												
2. TE	.40											
3. TT	.39	.93◆										
4. Pre Subjective Performance	.43	.18	.24									
5. Pre Match Winning %	.27	.21	.17	.43								
6. Pre Game Winning %	.11	-.06	-.15	.20	.70◆							
7. Pre Mean Pts Scored Against	-.32	-.28	-.32	-.48	-.83◆	-.51						
8. Pre Mean Pt Differential	.32	.42	.46	.41	.82◆	.49	-.97◆					
9. Post Subjective Performance	.00	.24	.22	.00	.52	.37	-.47	.67*				
10. Post Match Winning %	-.04	.07	.00	.18	.76◆	.48	-.62*	.59*	.40			
11. Post Game Winning %	.04	.12	.00	.16	.78◆	.56*	-.54	.54	.43	.96◆		
12. Post Mean Pts Scored Against	-.06	-.47	-.45	-.19	-.49	-.23	.58*	-.68*	-.61◆	-.46	-.51*	
13. Post Mean Pt Differential	.17	.31	.32	.38	.61*	.36	-.80◆	.82◆	.56*	.67◆	.64◆	-.80◆

Note. ◆ p< .01; * p< .05

Table 6

Correlations at Time 2 Between Collective Efficacy (CE), Teammate Efficacy (TE), Teammate Trust (TT), and Pre- and Post-Performance Measures.

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. CE												
2. TE	.63◆											
3. TT	.69◆	.93◆										
4. Pre Subjective Performance	.43	.25	.45									
5. Pre Match Winning %	.10	.04	.12	.40								
6. Pre Game Winning %	.19	.16	.21	.43	.96◆							
7. Pre Mean Pts Scored Against	-.41	-.32	-.43	-.61◆	-.46	-.51*						
8. Pre Mean Pt Differential	.42	.08	.24	.56*	.67◆	.64◆	-.80◆					
9. Post Subjective Performance	.28	.26	.37	.77◆	.07	.16	-.25	.14				
10. Post Match Winning %	.30	.00	.04	.23	-.07	-.04	-.35	.31	.45			
11. Post Game Winning %	.23	.17	.14	.06	.20	.34	-.09	.03	.42	.61◆		
12. Post Mean Pts Scored Against	-.50*	-.32	-.42	-.53*	-.24	-.23	.69*	-.65◆	-.53*	-.59*	-.22	
13. Post Mean Pt Differential	.44	.08	.25	.46	.27	.29	-.51*	.54*	.31	.31	.14	-.74◆

Note. ◆ p< .01; * p< .05

Table 7

Correlations at Time 3 Between Collective Efficacy (CE), Teammate Efficacy (TE), Teammate Trust (TT), and Pre- and Post-Performance Measures.

Variables	1	2	3	4	5	6	7	8	9	10	11
1. CE											
2. TE	.90◆										
3. TT	.89◆	.97◆									
4. Pre Subjective Performance	.35	.42	.40								
5. Pre Match Winning %	.19	.14	.12	.45							
6. Pre Game Winning %	.18	.23	.18	.42	.61◆						
7. Pre Mean Pts Scored Against	-.45	-.35	-.35	-.53*	-.59*	-.22					
8. Pre Mean Pt Differential	.35	.09	.11	.31	.31	.14	-.74◆				
9. Post Match Winning %	.26	.01	.09	-.15	.31	-.05	-.44	.39			
10. Post Game Winning %	.10	-.09	.00	-.04	.43	.00	-.46	.27	.93◆		
11. Post Mean Pts Scored Against	.00	.06	-.07	-.28	-.39	-.15	.50	-.37	-.65◆	-.69◆	
12. Post Mean Pt Differential	.11	.00	.06	.06	.60*	.11	-.48	.09	.80◆	.93◆	-.61*

Note. ◆ p< .01; * p< .05

Table 8

Correlations at the Between Level Between Collective Efficacy (CE), Teammate Efficacy (TE), Teammate Trust (TT), and Pre- and Post- Performance Measures.

Variables	1	2	3	4	5	6	7	8	9	10
1. CE										
2. TE	.72◆									
3. TT	.71◆	.95◆								
4. Pre Match Winning %	.10	.01	.00							
5. Pre Game Winning %	.08	.00	-.51	.82◆						
6. Pre Mean Pts Scored Against	-.24	-.28	-.31	-.76◆	-.40					
7. Pre Mean Pt Differential	.36	.13	.23	.73◆	.49	-.77◆				
8. Post Match Winning %	.29	.07	.12	.80◆	.62◆	-.67*	.81◆			
9. Post Game Winning %	.26	.09	.09	.79◆	.85◆	-.47*	.62◆	.86◆		
10. Post Mean Pts Scored Against	-.16	-.20	-.30	-.72◆	-.40	.86◆	-.85◆	-.80◆	-.59◆	
11. Post Mean Pt Differential	.23	.06	.14	.59*	.43	-.62◆	.92◆	.77◆	.61◆	-.78◆

Note. ◆ p< .01; * p< .05

Table 9

Multilevel Model for Mean Points Scored Against

Fixed Effect	Coefficient	SE	t
Mean points scored against	21.19	2.62	8.09**
Collective efficacy	-4.50	2.84	-1.58
Teammate efficacy	4.25	3.62	1.17
Trust in coach	.87	1.60	.54
Time	-.03	1.30	-.03
Collective efficacy	3.49	2.27	1.54
Teammate efficacy	-3.71	2.94	-1.26
Trust in coach	-.29	1.22	-.24
Past Performance (mean points scored against)	.71	.23	3.07**

Note. ** p< .01; * p< .05

Table 10

Explanatory Power at the Within Team and Between Team Levels for Mean Points Scored Against

		Variance Estimates			
Mean Points Scored Against	No Predictors	Within-Level Predictors Only	Within- and Between-Level Predictors	Percentage of Variance Accounted for	Percentage of Total Variance Accounted for
Within	8.81	11.57	11.39	9%	6.2%
Between	4.07	.13	.34	1.4%	.4%
Total					6.6%

Table 11

Multilevel Model for Mean Point Differential

Fixed Effect	Coefficient	SE	t
Mean point differential	-3.92	4.01	-0.978
Collective efficacy	5.45	5.14	1.06
Teammate efficacy	2.76	6.23	.44
Trust in coach	-2.62	2.73	-.96
Time	1.46	1.96	.75
Collective efficacy	.62	3.90	.16
Teammate efficacy	-5.41	5.23	-1.03
Trust in coach	.87	2.04	.43
Past Performance (mean point differential)	.10	.17	.63

Note. ** p< .01; * p< .05

Table 12

Explanatory Power at the Within Team and Between Team Levels for Mean Point Differential

		Variance Estimates			
Mean Point Differential	No Predictors	Within-Level Predictors Only	Within- and Between-Level Predictors	Percentage of Variance Accounted for	Percentage of Total Variance Accounted for
Within	25.21	32.58	32.19	3.5%	2.6%
Between	8.20	.04	.06	1.2%	.3%
Total					2.9%

Table 13

Multilevel Model for Backing-up Behaviors

Fixed Effect	Coefficient	SE	t
Backing-up Behaviors	2.86	.25	11.41**
Collective efficacy	.48	.52	.92
Teammate trust	.14	.50	.30
Time	-.00	.09	-.02
Collective efficacy	.20	.17	1.14
Teammate trust	-.93	.20	-4.57**

Note. ** p< .01; * p< .05

Table 14

Explanatory Power at the Within Team and Between Team Levels for Backing-up Behaviors

		Variance Estimates			
Backing-up Behaviors	No Predictors	Within-Level Predictors Only	Within- and Between-Level Predictors	Percentage of Variance Accounted for	Percentage of Total Variance Accounted for
Within	.22	.11	.11	50%	15%
Between	.50	.52	.50	3.8%	2.7%
Total					17.7%

Table 15

Multilevel Model for Causal Dimension Scale-Teams: Stability

Fixed Effect	Coefficient	SE	t
Stability	3.74	.35	10.55**
Teammate trust	-.59	.51	-1.16
Trust in coach	-.86	.31	-2.81**
Subjective performance	.95	.58	1.65
Time	.17	.16	1.04
Teammate trust	.47	.39	1.20
Trust in the coach	.32	.21	1.50
Subjective performance	-.10	.33	-.31

Note. ** p< .01; * p< .05

Table 16

Explanatory Power at the Within Team and Between Team Levels for Stability

		Variance Estimates			
Stability	No Predictors	Within-Level Predictors Only	Within- and Between-Level Predictors	Percentage of Variance Accounted for	Percentage of Total Variance Accounted for
Within	.44	.41	.31	29.5%	14.8%
Between	.44	.39	.31	20.5%	10.2%
Total					25%

APPENDICES

Appendix A

Demographics

AGE:

HEIGHT:

WHAT POSITION DO YOU USUALLY PLAY?:

HOW OFTEN DO YOU START A GAME (circle one):

Never Not a whole lot About half the time A lot of the time Always

HOW OLD WERE YOU WHEN YOU STARTED PLAYING COMPETITIVE VOLLEYBALL?:

FOR HOW MANY SEASONS HAVE YOU PLAYED WITH YOUR TEAM?:

DO YOU PLAY COMPETITIVE VOLLEYBALL YEAR-ROUND?(circle one):

Yes No

Appendix B

Self-efficacy and Collective Efficacy Measures

Rate your confidence in YOUR OWN ability to effectively perform the following defensive tasks: ***Circle ONE for each question***

	Not at All Confident										Extremely Confident
1. Pass a tough serve	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
2. Pick up a tip	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
3. Defend against a hard driven attack	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
4. Dive/roll when necessary to play a ball	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
5. Back up my teammates if they are out of position or miss a shot	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Rate your confidence in YOUR TEAM'S ability as a whole to effectively perform the following defensive tasks:
Circle ONE for each question

	Not at All Confident										Extremely Confident
1. Pass a tough serve	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
2. Pick up a tip	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
3. Defend against a hard driven attack	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
4. Dive/roll when necessary to play a ball	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
5. Back each other up if they are out of position or miss a shot	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Appendix C

Teammate Efficacy, Teammate Trust, and Backing-up Measures

Rate your confidence in EACH of your TEAMMATES' ability to perform these defensive tasks:

I believe that my teammate *NAME* CAN correctly…

	Not at All Confident										Extremely Confident
1. Pass a tough serve	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
2. Pick up a tip	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
3. Defend against a hard driven attack	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
4. Dive/roll when necessary to play a ball	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
5. Back me up if I am out of position or miss a shot	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Rate how much you TRUST that EACH OF YOUR TEAMMATES will CORRECTLY and EFFECTIVELY perform the following defensive tasks during a very crucial game situation:

I TRUST that my teammate *NAME* WILL…

	Do Not Trust at All										Completely Trust
1. Pass a tough serve	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
2. Pick up a tip	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
3. Defend against a hard driven attack	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
4. Dive/roll when necessary to play a ball	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
5. Back me up if I am out of position or miss a shot	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Rate how much you agree with the following statement:

	Completely Disagree										Completely Agree
I often feel like I have to back-up or cover more of the court for this teammate	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Appendix D

Trust in Coach Measure

Rate how much you TRUST YOUR HEAD COACH:
Circle ONE NUMBER for each question

1. **My coach approaches his/her job with expertise and dedication.**

Strongly Disagree Strongly Agree

0 1 2 3 4 5 6 7 8 9 10

2. **Given my coach's past performance, I see no reason to doubt his/her competence.**

Strongly Disagree Strongly Agree

0 1 2 3 4 5 6 7 8 9 10

3. **I can rely on the coach not to make my job (as a player) more difficult by poor coaching.**

Strongly Disagree Strongly Agree

0 1 2 3 4 5 6 7 8 9 10

4. **I respect my coach's ability to make the most of our team's talents.**

Strongly Disagree Strongly Agree

0 1 2 3 4 5 6 7 8 9 10

Appendix E

Causal Dimension Scale – Teams (CDS-T)

Attribution Scale

Please answer all questions as honestly as possible. All answers will be treated with the strictest of confidence.

1. How well do you feel your team has performed so far this season (please circle one)?

not well at all not well so-so well very well

2. Please write what you feel to be the <u>most likely CAUSE</u> of your team's performance so far this season.

_____

Now please complete the following questions: Think about the cause you wrote above. The items below concern your opinions of this cause or causes of your team's performance.

Please circle one number for each of the following questions.

Is the cause above something:

1. Caused by something in your team	9	8	7	6	5	4	3	2	1	Caused by something outside the team
2. Your team can do something about	9	8	7	6	5	4	3	2	1	Your team can do nothing about
3. Permanent (won't change)	9	8	7	6	5	4	3	2	1	Temporary (will change)
4. Your team can control	9	8	7	6	5	4	3	2	1	Your team cannot control
5. Controllable by people outside your team	9	8	7	6	5	4	3	2	1	That no one can control
6. Inside the team	9	8	7	6	5	4	3	2	1	Outside the team
7. That doesn't change over time	9	8	7	6	5	4	3	2	1	That changes over time
8. Under the power of people outside the team	9	8	7	6	5	4	3	2	1	Not under the power of people outside the team
9. Due to your team	9	8	7	6	5	4	3	2	1	Due to stuff outside the team
10. Over which your team has power	9	8	7	6	5	4	3	2	1	Over which your team has no power
11. Unchangeable	9	8	7	6	5	4	3	2	1	Changeable
12. People outside the team can adjust	9	8	7	6	5	4	3	2	1	People outside the team cannot adjust
13. About your team	9	8	7	6	5	4	3	2	1	About the situation
14. Controllable by your team	9	8	7	6	5	4	3	2	1	Not controllable by your team
15. Stays the same across games	9	8	7	6	5	4	3	2	1	Changes from game to game
16. Determined by people outside the team	9	8	7	6	5	4	3	2	1	Not determined by people outside the team

Appendix F

Coach Rankings

For each of the following defensive skills, rate all your athletes from MOST EFFECTIVE (1.) to LEAST EFFECTIVE (15.)

Pass a tough serve

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____

Pick up a tip

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____

Defend against a hard driven attack

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____

Dive/roll when necessary to play a ball

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____

Back up a teammates if they are out of position or miss a shot

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____

Name up to three of your athletes you would consider your "go-to" girls who you could count on if your team was in a very crucial game situation (1. = first "go-to" girl; 2. = 2nd "go-to" girl, etc).

1. _____
2. _____
3. _____

REFERENCES

References

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84,* 191-215.

Bandura, A. (1986). *Social Foundations of thought and action: A social cognitive theory.* Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (1990). Perceived self-efficacy in the exercise of personal agency. *Journal of Applied Sport Psychology, 2*, 128-163.

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York: Freeman.

Bandura, A. (2006). Guide for creating self-efficacy scales. In F. Pajares & T. Urdan (eds.), *Self-efficacy beliefs of adolescents* (pp. 307-337). Greenwich, CT: Information Age Publishing.

Barnes, C.M., Hollenbeck, J.R., Wagner, D.T., DeRue, D.S., Nahrgang, J.D., & Scwind, K.M., (2008). Harmful help: The costs of backing-up behavior in teams. *Journal of Applied Psychology, 93*, 529-539. doi: 10.1037/0021-9010.93.3.529

Beauchamp, M.R., & Whinton, L.C. (2005). Self-efficacy and other-efficacy in dyadic performance: Riding as one in equestrian eventing. *Journal of Sport and Exercise Psychology, 27*, 245-252.

Blau, P. (1964). *Exchange and power in social life.* New York, NY: Wiley.

Clark, M., & Gronbech, C.E. (1987). The effect of age, sex, and participation in age group athletics on the development of trust in children. *International Journal of Sport Psychology, 18,* 181-187.

Dirks, K.T. (1999). The effect of interpersonal trust on work group performance. *Journal of Applied Psychology, 84*, 445-455.

Dirks, K.T. (2000). Trust in leadership and team performance: Evidence from NCAA basketball. *Journal of Applied Psychology, 85*, 1004-1012.

Dirks, K.T., & Ferrin, D.L. (2001). The role of trust in organizational settings. *Organization Science, 12*, 450-467.

Dirks, K.T., & Ferrin, D.L. (2002). Trust in Leadership: Meta-analytic findings and implications for research and practice. *Journal of Applied Psychology, 87*, 611-628.

Dirks, K.T., & Skarlicki, D.P. (2009). The relationship between being perceived as trustworthy by coworkers and individual performers. *Journal of Management, 35*, 136-157. doi: 10.1177/0149206308321545

Feltz, D.L, (1982). A path analysis of the causal elements in Bandura's theory of self-efficacy and an anxiety-based model of avoidance behavior. *Journal of Personality and Social Psychology, 42* 764-781.

Feltz, D.L. (1988). Gender differences in the causal elements of self-efficacy on a high-avoidance motor task. *Journal of Sport and Exercise Psychology, 10*, 151-166.

Feltz, D.L., Chow, G.M., & Hepler, T.J. (2008). Path analysis of self-efficacy and diving performance revisited. *Journal of Sport & Exercise Psychology, 30*, 401-411.

Feltz, D.L., Landers, D.M., & Reader, U. (1979). Enhancing self-efficacy in high-avoidance motor tasks: A comparison of modeling techniques. *Journal of Sport Psychology, 1*, 112-122.

Feltz, D.L., & Lirgg, C.D. (1998). Perceived team and player efficacy in hockey. *Journal of Applied Psychology, 83*(4), 557-564.

Feltz, D.L., & Mugno, D.A. (1983). A replication of the path analysis of the causal elements in Bandura's theory of self-efficacy and the influence of automatic perception. *Journal of Sport Psychology, 5,* 263-277.

Feltz, D.L., Short, S.E., & Sullivan, P.J. (2008). *Self-efficacy in sport: Research and strategies for working with athletes, teams, and coaches.* Champaign, IL: Human Kinetics.

Gilson, T.A., Chow, G.M, & Feltz, D.L. (in press). Self-efficacy and athletic squat performance: Positive or negative influences at the within and between levels of analysis? *Journal of Applied Social Psychology*.

Golembiewski, R., & McConkie, M. (1975). The centrality of interpersonal trust in group process. In C. Cooper (Ed.), *Theories of group process* (pp. 131-185). New York: Wiley.

Greenlees, I.A., Lane, A., Thelwell, R., Holder, T., & Hobson, G. (2005). Team-referent attributions among sport performers. *Research Quarterly for Exercise and Sport, 76*, 477-487.

Heuzé, J.P., Raimbault, N. & Fontayne, P. (2006). Relationships between cohesion, collective efficacy and performance in professional basketball teams: An examination of mediating effects. *Journal of Sports Sciences, 24*, 59-68.

Hogdes, L., & Carron, A. V. (1992). Collective efficacy and group performance. *International Journal of Sport Psychology, 23,* 48-59.

Jackson, B., Beauchamp, M.R., & Knapp, P. (2007). Relational efficacy beliefs in athlete dyads: An investigation using actor-partner interdependence models. *Journal of Sport and Exercise Psychology, 29*, 170-189.

Jackson, B., Knapp, P., & Beauchamp, M.R. (2008). Origins and consequences of tripartite efficacy beliefs within elite athlete dyads. *Journal of Sport and Exercise Psychology, 30*, 512-540.

Jung, D.I., & Sosik, J.J. (2003). Group potency and collective efficacy: Examining their predictive validity, level of analysis, and effects of performance feedback on future group performance. *Group and Organization Management, 28*, 366-391. doi: 10.1177/1059601102250821

Lent, R.W., & Lopez, F.G. (2002). Cognitive ties that bind: A tripartite view of efficacy beliefs in growth-promoting relationships. *Journal of Social and Clinical Psychology, 21*, 279-291.

Lichacz, F. M., & Partington, J. T. (1996). Collective efficacy and true group performance. *International Journal of Sport Psychology, 27*, 146-158.

Lynch, P., Jonson, P., & Dibbeen, M. (2007). Exploring relationships of trust in 'adventure' recreation. *Leisure Studies, 26*, 47-64. doi: 10.1080/02614360500284767

Mayer, R.C., Davis, J.H., & Schoorman, F.D. (1995). An integrative model of organizational trust. *Academy of Management Review, 20*, 709-734.

McAuley, E. (1985). Modeling and self-efficacy: A test of Bandura's model. *Journal of Sport Psychology, 7*, 283-295.

McGowan, S.J., & McGowan, R.W. (1991). Trust and adolescent sports: Starters vs nonstarters. *Perceptual and Motor Skills, 73*, 714. doi: 10.2466/PMS.73.7.714-714

McKnight, D.H., Cummings, L.L., & Chervany, N.L. (1998). Initial trust formation in new organizational relationships. *The Academy of Management Review, 23*, 473-490. doi: 10.2307/259290

Moritz, S.E., Feltz, D.L., Fahrbach, K.R., & Mack, D.E. (2000). The relation of self-efficacy measures to sport performance: A meta-analytic review. *Research Quarterly for Exercise and Sport, 71*, 280-294.

Myers, N.D., & Feltz, D.L. (2007). From self-efficacy to collective efficacy in sport: Transitional issues. In G. Tenenbaum & R.C. Eklund (Eds.), *Handbook of sport psychology* (3rd ed.) (pp. 799-819). New York, NY: Wiley.

Myers, N.D., Feltz, D.L., & Short, S.E. (2004). Collective efficacy and team performance: A longitudinal study of collegiate football teams. *Group Dynamics: Theory, Research, and Practice, 8,* 126-138.

Myers, N.D., Payment, C.A., & Feltz, D.L. (2004). Reciprocal relationships between collective

efficacy and team performance in women's ice hockey. *Group Dynamics: Theory, Research, and Practice, 8*, 182-195.

Nicolls, J.G. (1990). What is ability and why are we mindful of it? A developmental perspective. In R.J. Sternberg & J. Kolligian (Eds.), *Competence considered*. New Haven, CT: Yale University Press.

Porter, C.O.L.H. (2005). Goal orientation: Effects on backing up behavior, performance, efficacy, and commitment in teams. *Journal of Applied Psychology, 90*, 811-818. doi: 10.1037/0021-9010.90.4.811

Porter, C.O.L.H., Hollenbeck, J.R., Ilgen, D.R., Ellis, A.P.J., West, B.J., & Moon, H. (2003). Backing up behaviors in teams: The role of personality and legitimacy of need. *Journal of Applied Psychology, 88,* 391-403. doi: 10.1037/0021-9010.88.3.391

Raudenbush, S.W., & Bryk, A.S. (2002). *Hierarchical linear models: Applications and data analysis methods.* Newbury Park, CA: Sage.

Rousseau, D.M., Sitkin, S.B., Burt, R.S., & Camerer, C. (1998). Not so different after all: A cross-discipline view of trust. *Academy of Management Review, 23,* 393-404.

Shen, M.J., & Chen, M.C. (2007). The relationship of leadership, team trust and team performance: A comparison of the service and manufacturing industries. *Social Behavior and Personality, 35*, 643-658.

Snijders, T., & Bosker, R. (1999). *Multilevel analysis: An introduction to basic and advanced multilevel modeling.* Newbury Park, CA: Sage.

Spink, K.S. (1990). Group cohesion and collective efficacy of volleyball teams. *Journal of Sport and Exercise Psychology, 12*, 301-311.

Vancouver, J.B., & Kendall, L.N. (2006). When self-efficacy negatively relates to motivation and performance in a learning context. *Journal of Applied Psychology, 91*, 1146-1153. doi: 10.1037/0021-9010.91.5.1146

Vancouver, J.B., Thompson, C.M., Tischner, E.C., & Putka, D.J. (2002). Two studies examining the negative effect of self-efficacy on performance. *Journal of Applied Psychology, 87*, 506-516. doi: 10.1037/0021-9010.87.3.506

Vancouver, J.B., Thompson, C.M., & Williams, A.A. (2001). The changing signs in the relationships among self-efficacy, personal goals, and performance. *Journal of Applied Psychology, 86*, 605-620. doi: 10.1037/0021-9010.86.4.605

Weinberg, R. (1985). Relationship between self-efficacy and cognitive strategies in enhancing endurance performance. *International Journal of Sport Psychology, 17*, 280-292.

Weinberg, R., Gould, D., & Jackson, A. (1979). Expectations and performance: An empirical test of Bandura's self-efficacy theory. *Journal of Sport Psychology, 1*, 320-331.

Weinberg, R.S., Gould, D., Yukelson, D., & Jackson, A. (1981). The effects of pre-existing and manipulated self-efficacy on a competitive muscular endurance task. *Journal of Sport Psychology, 3,* 345-354.

Weinberg, R.S., Yukelson, D., & Jackson, A. (1980). Effect of public and private efficacy expectations on competitive performance. *Journal of Sport Psychology, 2*, 340-349.