“POWER OF WE”: EFFECTS OF MOTIVATIONAL SELF-TALK AND SYNCHRONY ON PERFORMANCE, EFFICACY BELIEFS, AND SENSE OF UNITY IN DYADIC EXERCISE

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ABSTRACT

"POWER OF WE": EFFECTS OF MOTIVATIONAL SELF-TALK AND SYNCHRONY ON PERFORMANCE, EFFICACY BELIEFS, AND SENSE OF UNITY IN DYADIC EXERCISE

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This dissertation investigated the effects of 'individual-focused' versus 'group-focused' self-talk and synchrony on performance, self-efficacy, collective efficacy, and sense of unity in a dyadic exercise setting. Additionally, this study sought to identify whether individualist and collectivist orientations influence the way in which self-talk strategies enhance performance and one's beliefs about one's own and one's team's capabilities. Previous research found that group-focused self-talk was effective in enhancing performance and both self- and collective efficacy (Son, Jackson, Grove, & Feltz, 2011). Synchrony research has also demonstrated its positive impact on fostering relative team outcomes (e.g., relationship quality, sense of unity, and satisfaction; Vacharkulksemsuk & Fredrickson, 2011; Wiltermuth & Heath, 2009). Participants were 346 undergraduate students who were randomly assigned to a same-gender dyad. Dyads were allocated to one of 12 conditions in a 3 (self-talk condition: I version, we version, control) x 2 (synchrony: synchronous activity, asynchronous activity) x 2 (task type: additive, coactive condition) x 2 (block) design with repeated measures on the last factor. Participants completed one block of an abdominal plank exercise alone and the second as a part of a dyad. Participants also completed questionnaires regarding their individualistic and collectivistic orientations, self-efficacy, collective efficacy, and sense of unity. Between the two blocks a self-talk intervention was implemented. Using ANCOVAs with baseline measures as a covariate, although no significant effects for individualistic or collectivistic orientations were found, participants using individual-oriented self-talk reported greater performance improvement compared to those in the

control condition. Stronger sense of self-efficacy and greater enjoyment in working as a group was found in the group-focused self-talk condition compared to the control condition. Individuals in the additive condition reported greater performance improvement and higher levels of collective efficacy than did those in the coactive condition. Lastly, synchrony produced greater performance improvement and stronger sense of unity compared to the asynchrony condition. Findings of the study contribute to the self-talk and synchrony literature in team sport and exercise contexts and how these strategies can be effectively implemented to enhance performance and efficacy beliefs.

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INTRODUCTION

Nature of Problem

"Each individual is strong but we as a whole team are much stronger."

The above quote, taken from an interview with Hong Myung-Boo, the head coach of the South Korean soccer team, was thought by many to contribute to the unthinkable happening in the 2012 London Olympic Games (Kuck & Jun, 2012, p. 43). It was surprising to see the 28th ranked South Korean team come away with a Bronze medal at the 2012 London Olympic Games. Indeed, it is not uncommon that a team consisting of hypothetically less skilled members sometimes outperforms a team with more talented members. Why are some teams able to achieve collective attainments while other teams fail to reach performance expectations? Research has suggested that efficacy beliefs can be a determinant contributing to optimal team functioning and motivation (e.g., Badura, 1997).

The purpose of this dissertation was to examine the effects of efficacy-enhancing techniques (i.e., motivational self-talk and synchrony) on performance in a small group setting, using controlled, experimental methods. If these efficacy-enhancing techniques are shown to be effective in controlled settings with small groups, then they can be field tested with larger teams. This chapter begins with a brief review of literature on efficacy beliefs and the efficacy-enhancing techniques of self-talk strategy. It is followed by a discussion on the potential effects of individual's orientation of individualism-collectivism (I-C), types of task, and sense of unity on the development of efficacy beliefs. Lastly, literature on sense of unity and synchrony with respect to performance and efficacy beliefs is also reviewed.

Guided by proposals outlined in Bandura's (1986) Social Cognitive Theory (SCT), considerable research has been devoted to fostering the understanding of two distinct forms of

'efficacy' perceptions, namely self-efficacy and collective efficacy, which relate to individuals' beliefs in their own and their teams' capabilities to be successful at a task, respectively (Bandura, 1997). According to SCT, self-efficacy and collective efficacy represent distinct forms of task-specific social cognitions that are predictive of adaptive outcomes in both independent and interdependent contexts. Indeed, a substantial body of research has shown that a high degree of efficacy in one's own and one's team's ability is predictive of enhanced performance in various contexts (e.g., Heuze, Raimbault, & Fontayne, 2006; Moritz, Feltz, Fahrbach, & Mack, 2000; Myers, Feltz, & Short, 2004), as well as additional desirable outcomes, such as individual and team effort, team cohesion, and positive affective states (e.g., George, 1994; Greenlees, Graydon, & Maynard, 1999; Paskevich, Brawley, Dorsch, & Widmeyer, 1999).

Bandura (1997) theorized that perceptions of self-efficacy are derived from four principle sources of information, namely (a) prior performance accomplishments, (b) vicarious experiences, (c) physiological and emotional states, and (d) verbal persuasion. The most influential of these factors relates to one's prior performance accomplishments, as these provide direct behavioral evidence relating to an individual's capability in a given context (e.g., Wise & Trunnell, 2001). Self-efficacy beliefs are also derived from vicarious experiences, where the observation of others demonstrating mastery or coping on a given task may bolster one's own expectations about performance capabilities. Third, one's physiological and emotional state (e.g., pain, anxiety, fatigue, injury) may serve to support (or undermine) individuals' confidence in their ability, and finally, self-efficacy perceptions may also be modified via the verbal persuasion one receives from third parties. As Bandura noted, positive persuasion fosters individuals' beliefs in their capabilities, on the other hand, personal efficacy perceptions may be substantively

undermined by negative feedback, most notably when the source of information is perceived as credible and knowledgeable (e.g., a coach).

In addition to verbal persuasion from significant others however, Bandura (1997) also posited that self-initiated, or internal verbal persuasion (i.e., 'self-talk') may further serve to promote self-efficacy beliefs, theorizing "that inner speech…serves as the principle vehicle of thought and self-direction" (p. 224). Self-talk refers to either covert or overt self-verbalizations used by individuals, which may serve both instructional and motivational functions (Hardy, 2006). For example, Gammage, Hardy, & Hall (2001) found that almost 87% of exercisers were engaged in either covert or overt self-talk during their work-out and the frequently used phrases were "I can do it" (i.e., motivational phrase), "5 more raps" (goal related phrase), and "keep knees bent" (instructional phrase). Research on self-talk has primarily focused on investigating how this concept may bolster performance levels, with reports indicating that 'facilitative' forms of self-talk may underpin positive performance outcomes (e.g., Theodorakis, Hatzigeorgiadis, & Zourbanos, 2012). In comparison to the literature examining the effects of self-talk upon performance, empirical evidence for the role of self-talk in shaping self-efficacy perceptions is somewhat limited. In one related study however, Weinberg and colleagues (Weinberg, Grove, & Jackson, 1992) examined strategies used for building self-efficacy by tennis coaches, with analyses showing that coaches frequently encouraged their players to use positive self-talk as a means for enhancing self-efficacy. Recently, Hatzigeorgiadis and his colleagues have provided empirical evidence for the effectiveness of self-talk on enhancing efficacy beliefs (Hatzigeorgiadis, Zourbanos, Goltsios, & Theodorakis, 2008; Hatzigeorgiadis, Zourbanos, Mpoumpaki, & Theodorakis, 2009).

Nonetheless, at present there has been relatively little empirical evidence directly addressing the effect of self-talk on self-efficacy. Indeed, in a recent review of the efficacy literature, Feltz, Short, and Sullivan (2008) noted that the number of studies examining the impact of self-talk in sport was 'surprisingly low'.

Despite a couple of recent experimental investigations indicating that motivational self-talk may foster self-efficacy beliefs (Hatzigeorigiadis et al., 2008; 2009), the role of self-talk has received minimal experimental scrutiny in a group setting. Given that many activities are not performed individually, it is somewhat surprising that the literature exploring the mechanism of self-talk on a group task remains limited. Indeed, anecdotal accounts regarding the effectiveness of self-talk in team sports have been evident in the sport psychology literature (Ronglan, 2007). From interviews with athletes playing team sports, Ronglan reported that positive self-talk strategies helped enhance confidence in the capability of one's team (i.e., collective efficacy) and as well as in their own ability, and he further noted that athletes perceived that self-talk can be one of the most effective strategies to improve their team performance and collective efficacy beliefs.

To fill this gap, Son, Jackson, Grove, and Feltz (2011) examined whether motivational self-talk could help improve performance and confidence using a team dart-throwing competition. In that experimental study, participants were allocated to small groups and given a copy of self-talk scripts that were framed using either the individual's capabilities (e.g., "*I* can perform well") or the group's capabilities (e.g., "*we* can perform well"). Given the finding from Hamilton, Scott, & MacDougall (2007), revealing that recorded forms of self-talk was more effective than the normal forms of self-talk (asking participants to engage in self-talk with the given statements), they were asked to record the given statements and also asked to listen to their

own recording for 2 minutes prior to their competition and during the competition. The results showed that in comparison to a control group and "I"-referent self-talk group, individuals using "we"-referent motivational self-talk statements reported greater performance improvement and confidence in both their own capability and their team's capability. Son and her colleagues (2011) suggested that the effectiveness of group-oriented self-talk in enhancing performance and confidence in one's own and team's capability can be enhanced by developing a sense of unity. Thus, by contributing to a sense of unity among team members, group-referent self-talk can foster performance improvement and efficacy beliefs.

The current investigation, therefore, sought to build on these recent experimental studies by considering the role of different referents of motivational self-talk statements in relation to performance, efficacy beliefs, and a sense of unity in a team competition setting. In addition to the variables that are theorized to directly underpin individuals' self-efficacy and collective efficacy perceptions (e.g., self-talk), the degree to which an individual is confident in either him/herself or his/her team may also be moderated by a number of additional factors, such as individualist/collectivist perceptions, task characteristics, and synchrony.

Individualist/collectivist Perceptions

One personal factor that has been shown to influence the formation of efficacy perceptions relates to the extent to which people view themselves as either an 'individualist' or 'collectivist' (e.g., Early, 1994, 1999; Oettingen & Zosuls, 2006; Oyserman, Coon, & Kemmelmeier, 2002). According to individualism-collectivism theorists (Wagner, 2002), the *individualist* perspective implies that (a) creating a positive sense of self and personal successes are valued, (b) well-being is derived from the attainment of personal goals, and (c) judgment, reasoning, and causal inference are primarily focused on the person. On the other hand, a

collectivist orientation is apparent when one views oneself as, and identifies primarily with, a part of one or more groups. These theorists argue that, for collectivists, (a) one's values are reflective of group goals, such as maintaining harmonious relationships with others, (b) successfully carrying out social roles is an important source of well-being, and (c) social context, situational constraints, and social roles figure prominently in person perception and causal reasoning. Overall, individualists are more likely to focus on personal needs, rights, and abilities, while collectivists find it natural to think about the needs, capabilities, and goals of their 'group'.

With regard to these orientations, Bandura proposed that "the influence of individualistic and collectivistic orientations… operates largely through beliefs of individual and group efficacy" (1997, p. 32). Specifically, in light of the respective tendencies, individualists are more likely to achieve high perceived efficacy and productivity when their need for uniqueness is satisfied, whilst collectivists tend to be most efficacious when their need for interdependence is met. Accordingly, social psychologists have previously investigated the factors that both influence and are influenced by one's tendency to think and act in individualist or collectivist ways (e.g., Earley, 1994, 1999; Gibson, 1999; Oettingen & Zosuls, 2006; Oyserman et al., 2002). For example, Earley (1999) investigated how individuals' individualistic and collectivistic orientation would moderate the influence of collective efficacy beliefs on group decisions-making processes among managers. Participants were assigned to a three-person team and asked to perform a given group task. Collective efficacy was measure at two levels: (a) individual level – person's estimation of his/her group's capability and (b) group level - a single collective judgment of group efficacy estimate to represent its collective judgment. Results demonstrated that in high collectivistic cultures, collective judgments of group capability were higher than in lower collectivistic cultures. However, there was a limitation in Earley's (1999) study. The

distinction between the impact upon self-efficacy and collective efficacy perceptions could not be made, as self-efficacy beliefs were not measured. Gibson (1999) also found that collective efficacy was a significant determinant of group effectiveness for only collectivists but not for those with low collectivistic orientations.

In an earlier study, Earley (1994) also investigated the effects of 'individual-focused' and 'group-focused' training on performance and self-efficacy among individualist and collectivist managers. The individual-focused protocol consisted of personally-relevant information (e.g., prior personal performance and personal performance enhancing strategies), whereas, whilst the group-focused intervention contained the same material, this was modified in order to emphasize group performance and group enhancement. Results revealed that individualists performed better and perceived higher levels of self-efficacy when receiving individual-focused training compared to group-focused training. Conversely, among collectivists, group-focused training produced enhanced performance and a stronger sense of self-efficacy, suggesting that greater benefits were apparent when the intervention type (i.e., focused on the group or individual) matched the individual's orientation.. Given that one type of self-talk focuses on the individual's ability, and the other focuses on the group's collective capabilities, it is likely that 'individual-oriented' and 'group-oriented' strategies may be most effective in promoting self-efficacy and collective efficacy beliefs, respectively.

To fill this gap, Son (2008) examined whether individuals' individualism-collectivism dimensions would moderate the effect of different types (group-focused versus individual-focused) of self-talk on shaping self-efficacy and/or collective efficacy beliefs in sports contexts. Although results showed no significant effects for individualism-collectivism (I-C), she argued it may be possible that individualist-collectivist orientations in sporting pursuits may differ in

comparison to one's general social/organizational perceptions. Indeed, as noted by Bandura (2002), "people vary in individualistic and collectivistic social orientations depending on whether the reference group is familial, peer, academic, or national" (p. 275). Based on the prior literature on individualist and collectivist social orientations, the following hypotheses were proposed:

> *Hypothesis 1a,b,c. Controlling for individualistic and collectivistic orientations, participants in the group-oriented self-talk condition will report (a) greater performance improvement, (b) higher levels of self-efficacy and (c) higher levels of collective efficacy than those in individual-oriented self-talk condition. Hypothesis 1d. A stronger sense of unity will be produced in the group-oriented self-talk condition than in the individual-oriented self-talk condition.*

Task Types

In addition to I-C, task characteristics can be potentially influential on building efficacy beliefs because they are related to the type of experience that group members possess about what is required to perform effectively and the degree to which members are able to combine and integrate the experience stored by any individual member (Gibson, 1999; Goodman, Ravlin, & Schminke, 1990). Previous research in group contexts suggested that task interdependence can be influential on developing efficacy beliefs and consequently on group effectiveness (e.g., Gibson, 1999). Specifically, in Katz-Navon and Erez's (2005) study, collective efficacy was a significant predictor of team performance only in the high interdependent task condition while self-efficacy was highly related to individual performance when students performed an additive task (i.e., a task where the scores are added together, and sometimes averaged, to obtain one team score). The nature of task used in the previous study (Son et al., 2011) was an additive task in which the group's potential productivity is equal to the average productivity of all group members. The authors postulated that the task itself, framed as a team task, may contribute to

enhancing collective efficacy and further discussed that the extent to which the current findings generalize to different task types, such as coactive tasks is likely limited. Coactive tasks are those in which individuals work in the real or imagined presence of other but outcomes depend only one's own personal efforts. Thus, it would be necessary to examine effects of we-referent and I-referent self-talk on shaping efficacy beliefs between the additive condition and coactive condition in which individuals are not actually working together as a group (i.e., performing in one another's presence). Therefore, the following set of hypotheses was proposed:

> *Hypothesis 2a-d. Participants in the additive conditions will report (a) greater performance improvement, (b) a strong sense of self- and (c) collective efficacy, and (d) unity than those in the coactive condition.*

Synchrony

General cultural observations suggest that behavioral synchrony enhances a sense of "oneness" that bonds people together such as religious activities, military marching, and rituals among sport teams containing a large amount of rhythms to which people can move in synchrony (McNeill, 1995). *Behavioral synchrony* refers to the coordination of movement that occurs between individuals during a social interaction, featuring similarity of (a) form-the manner and style of movements, and (b) time-the temporal rhythm of movements (Kimura & Daibo, 2006). Indeed, an increasing body of recent studies on synchrony reveal its positive impact on compassion (Valdesolo & DeSteno, 2011), cooperation and a sense of unity (Wiltermuth & Heath, 2009), affiliation (Hove & Risen, 2009), affective states (Haidt, Seder, & Kesebir, 2008), satisfaction (Jones & Wirtz, 2007), relationship quality (Vacharkulksemsuk & Fredrickson, 2011), and even elevated pain thresholds (Cohen, Ejsmond-Frey, Knight, & Dunbar, 2010). For example, Vacharkulksemsuk and Fredrickson (2011) found out that when stranger-stranger dyads worked together, synchronous activities improved social connection quality. In

sport-specific contexts, similar results showed that group rowing training significantly increased pain thresholds compared with training alone while rower's power output was not different in both conditions (Cohen et al., 2010).

Despite such empirical and anecdotal evidence of synchrony effects, it is worth noting that there is limited evidence to test whether synchronous activity can enhance group performance and efficacy beliefs. Knowing that strong sense of unity, positive emotions, and relationship quality can be predictive of efficacy beliefs within groups (e.g., Allen, Jones, & Sheffield, 2009; Jackson, Beauchamp, & Knapp, 2007; Kozub & McDonnell, 2000), it is possible to say that synchrony may enhance collective efficacy. When group members are in synch, the experience of synchrony can provide the feeling that the dyad can coordinate and work together. It may be worthwhile to investigate how synchronous activity can be related to individuals' beliefs in their team's capability and as a result performance improvement. Thus, the current study was designed to test synchrony effects, as well as the role of different referents of motivational self-talk statements on group performance, efficacy beliefs and a sense of unity.

Hypothesis 3a,b, c. Participants in the synchronous condition will report (a) greater performance improvement, (b) higher levels of collective efficacy, and(c) stronger sense of unity than will those in the control condition.

In addition to main effects for different types of self-talk, task types, and synchrony, the current study examined the interaction effects among these factors. However, no direct hypotheses were proposed because of lack of evidence from previous research.

Contextual Factors

The context chosen for the current study was a dyadic exercise setting. A small group setting provides an ideal context in which to examine whether different types of self-talk strategy

and synchronous activity enhance efficacy beliefs, performance and a sense of unity compared with a large size group. Given that a stranger-stranger dyad was used in this study, variation in initial level of collective efficacy would be small.

Purpose of the Study

This study had three primary objectives. First, this investigation explored the effects of 'individual-focused' and 'group-focused' self-talk and synchrony on self-efficacy, collective efficacy, performance, and sense of unity in a dyadic exercise setting. In addition, this study also sought to identify whether individualist and collectivist orientations are associated with the way in which self-talk strategies enhance one's beliefs about one's own and one's team's capabilities. Lastly, this study was to examine effects of self-talk strategy on efficacy beliefs and performance between the additive condition and the coactive condition.

Delimitations

The dyads used in this study were formed artificially for the purpose of the experiment, and as a result team members are largely unfamiliar with one another prior to performing task and are not highly interdependent on each other for their performance, such as they are in team sports (e.g., soccer). The extent to which the current findings generalize to more experienced and bigger size teams is limited.

Definitions

A number of terms are repeatedly used throughout this manuscript. These terms, along with their conceptual definitions are provided below. Some of these definitions are also mentioned in the main text of this thesis.

1. *Additive tasks* - a task where the scores are added together to obtain one team score

2. *Coactive tasks- a task* in which individuals work in the real or imagined presence of other but outcomes depend only one's own personal efforts
3. *Collective efficacy* – a group's belief in its capacities to organize and execute actions to produce a desired group attainment (Bandura, 1997).
4. *Collectivism* – an individual's perceptions and attitudes in terms of viewing oneself as a part of one or more groups (Wagner, 2002).
5. *Individualism* – an individual's perceptions and attitudes in terms of seeing oneself as independent from a group (Wagner, 2002).
6. *Sense of unity* – perception that an aggregate of individuals is bonded together in some way to constitute a group (Campbell, 1958)
7. *Self-efficacy* – an individual's belief in his or her ability to execute a specific task (Bandura, 1997).
8. *Self-talk* – either covert or overt self-verbalizations, which can serve both instructional and motivational functions (Hardy, 2006).
9. *Synchrony* - the coordination of movement that occurs between individuals during a social interaction, featuring similarity of form and time (Kimura & Daibo, 2006)

CHAPTER 2

REVIEW OF LITERATURE

The purpose of this chapter was to provide a review of the literature that is relevant to the variables and hypotheses of this study. The chapter begins by offering a foundation for the hypotheses that represents an overview of the theory and literature supporting the efficacy beliefs and performance relationship, the effectiveness of self-talk on building efficacy beliefs, the effect for individualistic and collectivistic orientations on efficacy perceptions, and efficacy beliefs and types of task. Additionally, a summary of the literature on a sense of unity (i.e., group cohesion) with respect to its relationship with performance and efficacy beliefs is presented. This was followed by a summary of the literature for support of synchronous activity as a possible efficacy-enhancing technique.

Overview of Efficacy Beliefs and Relationships with Performance Variables

Guided by proposals outlined in Bandura's (1986) Social Cognitive Theory (SCT), considerable research has been devoted to fostering the understanding of two distinct forms of 'efficacy' perceptions, namely self-efficacy and collective efficacy, which relate to individuals' confidence beliefs in their own and their teams' capabilities, respectively (Bandura, 1997). According to SCT, self-efficacy and collective efficacy represent distinct forms of task-specific social cognitions that are predictive of performance and adaptive outcomes in both independent and interdependent contexts.

Self-efficacy has been defined by Bandura (1997) as an individual's belief in his or her ability to perform a specific task. As opposed to global 'confidence' levels, self-efficacy is not a general trait; rather, it is a task-specific construct. Efficacy theorists in various domains (Bandura, 1997; Feltz, et al., 2008; Pajares, 2002) noted that perceptions of self-efficacy provide the foundation for human motivation, well-being, and personal accomplishment because people have

little incentive to persevere in the face of obstacles unless they believe that their actions can create the outcomes that they desire. Moreover, strong self-efficacy beliefs lead to greater effort, persistence, resilience, and positive affective states in approaching specific tasks.

Bandura (1997) theorized that perceptions of self-efficacy are derived from four principle sources of information, namely (a) prior performance accomplishments, (b) vicarious experiences, (c) physiological and emotional states, and (d) verbal persuasion. The most influential of these factors relates to one's prior performance accomplishments, as these provide direct behavioral evidence relating to an individual's capability in a given context (e.g., Wise & Trunnell, 2001). Self-efficacy beliefs are also derived from vicarious experiences, where the observation of others demonstrating mastery or coping on a given task may bolster one's own expectations about performance capabilities. Third, one's physiological and emotional state (e.g., pain, anxiety, fatigue, injury) may serve to support (or undermine) individuals' confidence in their ability, and finally, self-efficacy perceptions may also be modified via the verbal persuasion one receives from third parties. As Bandura noted, positive persuasion fosters individuals' beliefs in their capabilities, on the other hand, personal efficacy perceptions may be substantively undermined by negative feedback, most notably when the source of information is perceived as credible and knowledgeable (e.g., a coach).

Self-efficacy and Performance

Based on Bandura's (1997) theoretical tenets, a substantial number of studies have revealed that increases in self-efficacy are positively correlated with individual performance in sport and exercise settings (e.g., Beauchamp, Bray, & Albinson, 2002; George, 1994; Miller, 1993; Oman & King, 1998;Treasure, Monson, & Lox, 1996; Weinberg, Gould, & Jackson, 1979). In one of the early research studies on self-efficacy, for example, Weinberg, Gould, and Jackson

(1979) manipulated perceptions of self-efficacy by having participants compete with a confederate on a muscular leg-endurance task. Results showed that participants in the high self-efficacy group maintained their muscle contraction significantly longer than those in the low self-efficacy group on the first trial. Following a reported failure, participants in the high self-efficacy group showed an increase in persistence during a second trial, whereas the low self-efficacy participants showed a decrease in persistence. Research has also reported that self-efficacy expectations were positively related to baseball hitting performance (George, 1994), golf performance (Beauchamp et al., 2002), wrestling performance (Treasure at al., 1996) and swimming performance (Miller, 1993). Moritz and her colleagues (Moritz, Feltz, Fahrabach, & Mack, 2000) conducted a meta-analysis of the self-efficacy literature in the sport domain, which provided support for Bandura's suggestion, by demonstrating that a moderate overall correlation (r = .38) between performance and efficacy beliefs, which ranged from a high of a .79 to a low of a .01.

Collective Efficacy and Performance

In recognition of the fact that many human endeavors take place within a social or group context, Bandura (1997) proposed the concept of collective efficacy to reflect a group's beliefs in its capabilities to organize and execute actions to produce a desired goal. Collective efficacy is not simply the sum of self-efficacy beliefs of people in a group; rather, it is a more complex group-oriented attribute that emerges from the group's coordinative and interactive dynamics. Collective efficacy is deemed to be conceptually distinct from self-efficacy in that it refers to group members' perceptions of their conjoint capabilities with regard to team activities (Bandura, 1997). However, in much the same way that self-efficacy beliefs influence individuals, stronger perceptions of collective efficacy are believed to result in greater effort on shared undertakings,

better persistence in the face of obstacles, and higher levels of group performance (Bandura, 1997; Zacccaro, Blair, Peterson, & Zazanis, 1995).

Chow and Feltz (2007) emphasize that collective efficacy relates not only to how well each and every group member can use his or her individual resources, but also to how well those resources can be coordinated and combined. Collective efficacy beliefs are important because, theoretically, individuals' beliefs in their group capability impact what people attempt to do as a group member, how much effort they spend on their team outcomes, and their persistence when collective efforts fail to produce quick results or meet with difficulties (Bandura, 1997; Feltz et al., 2008). Because a large number of organizational settings such as sports and business domains require sustained and coordinated team efforts to generate successful collective attainments, each team member's belief regarding his or her team's capabilities understandably affects the team's performance.

In an effort to expand scientific understanding of how efficacy beliefs are formed and how they influence sport performance, efficacy theorists have previously explored the relationships among self-efficacy, collective efficacy, and team performance (e.g., Feltz & Lirgg, 1998; Gully, Incalcaterra, Joshi, & Beaubien, 2002; Myers, Feltz, and Short, 2004). For instance, in Feltz and Lirgg's (1998) study assessing self-efficacy and collective efficacy perceptions among collegiate ice hockey players. The team efficacy measure comprised eight items that asked players to assess the degree of confidence they had in their team's ability to perform important game competencies. Team efficacy scores were computed by averaging the eight ratings made by each player. The self-efficacy measure consisted of three questions, which asked participants to rate their ability to (a) out-perform their defensive opponent, (b) out-perform their offensive opponent, and (c) bounce back from performing poorly. They found that team (i.e.,

collective) efficacy beliefs significantly increased after a win and significantly decreased after a loss, whereas self-efficacy beliefs were not impacted. These findings supported Bandura's (1997) suggestion that in team contexts, collective efficacy perceptions may be more closely associated with team performance than self-efficacy perceptions. In a similar line of research, Myers et al. (2004) examined the reciprocal relationship between collective efficacy, and teams' offensive performance over an American football season. The findings revealed that aggregated collective efficacy prior to performance was a positive predictor of subsequent offensive football performance, and also that previous offensive performance was predictive of subsequent collective efficacy perceptions.

According to Bandura, "perceived personal and collective efficacy differ in the unit of agency, but both forms of efficacy beliefs have similar sources, serve similar functions, and operate through similar processes" (1997, p. 478). As a result, the four processes outlined in relation to self-efficacy (i.e., performance accomplishments, vicarious experiences, verbal persuasion, and affective states), should also play an important role in the development of collective efficacy beliefs. For example, regarding performance accomplishments, using multilevel modeling, Watson, Chemers, and Preiser (2001) examined collective efficacy at the individual and group level in a collegiate basketball team. Individual perceptions of collective efficacy were measured by seven items including the following: "This team's confidence helps it to perform at its best"; and "This team is a very effective team". At the group level, collective efficacy was the average score of group members' collective efficacy scores. In a similar vein, self-efficacy was measured by five-items and examples included the following:"I have very high confidence in my ability to play my position or positions" and "I have all the skills needed to perform the things required of me very well.". Using HLM, results revealed that high self-

confidence was related to individuals having high perceptions of collective efficacy in a team. At the group level, collective efficacy was significantly predicted by team performance. Furthermore, teams that were successful in the previous season had greater team confidence near season's end. Vargas-Tonsing and Bartholomew (2006) provided empirical evidence for the effect of verbal persuasion upon collective efficacy in sport. The results revealed that participants reported a greater degree of team efficacy after listening to a motivational talk from their coach in comparison to their team efficacy prior to the talk. As individuals react to arousal, anxiety, stress, or excitement, so do groups. Teams with strong beliefs in their collective capability can meet challenges in the face of disruptive forces, whereas less efficacious groups tend to function less effectively. Hence, affective states may affect how groups interpret and react to the myriad difficulties they confront (Goddard, Hoy, Woolfolk, & Hoy, 2004). More recently, Ronglan (2007) investigated the production and maintenance of collective efficacy within an elite basketball team during a season. Through 17 qualitative post-season interviews, results showed that the production of team efficacy, as an interpersonal process, was brought about by performance accomplishments, interpretations of team history, preparations for upcoming contests, and positive persuasions.

In addition to the main four sources, perceptions of collective efficacy are theorized to be underpinned by individuals' self-efficacy beliefs. Indeed, as Feltz and colleagues proposed, "a team's confidence is undoubtedly rooted in and affected by confidence on the part of the individuals" (Feltz et al., 2008, p. 239). For instance, Watson et al. (2001) found a positive relationship between self-efficacy and collective efficacy in basketball teams. Results showed that individuals who held relatively high personal efficacy beliefs also tended to possess positive perceptions of collective efficacy. More recently, Magyar, Feltz, and Simpson (2004) also found

that self-efficacy was the strongest predictor of personal perceptions of 'team efficacy' perceptions within young rowing crews.

Self-talk as an Efficacy-enhancing Technique

In line with verbal persuasion from significant others, Bandura (1997) also posited that self-initiated, or internal verbal persuasion (i.e., 'self-talk') may further serve to promote self-efficacy beliefs, theorizing "that inner speech…serves as the principle vehicle of thought and self-direction" (p. 224). Self-talk refers to either covert or overt self-verbalizations used by individuals, which may serve both instructional and motivational functions (Hardy, 2006). Research on self-talk has primarily focused on investigating how this concept may bolster performance levels, with reports indicating that 'facilitative' forms of self-talk may underpin positive performance outcomes (e.g., Theodorakis, Hatzigeorgiadis, & Zourbanos, 2012).

Recently, research has progressively moved toward the identification of the functions underlying how self-talk strategies enhance performance (Hardy, 2006; Hardy, Oliver, & Todd, 2008). Researchers have suggested that self-talk can serve to enhance self-confidence and efficacy beliefs (e.g., Hatzigeorgiadis, Zourbanos, Goltsios, & Theodorakis, 2009; Hatzigeorgiadis, Zourbanos, Mpoumpaki, & Theodorakis, 2008; Son, Jackson, Grove, & Feltz, 2011; Weinber, Grove, & Jackson, 1992). In one related study, Weinberg and colleagues (Weinberg, Grove, & Jackson, 1992) examined strategies used for building self-efficacy by tennis coaches, with analyses showing that coaches frequently encouraged their players to use positive self-talk as a means for enhancing self-efficacy. Recently, Hatzigeorgiadis and his colleagues have provided empirical evidence for the effectiveness of self-talk on enhancing efficacy beliefs (Hatzigeorgiadis, Zourbanos, Goltsios, & Theodorakis, 2008; Hatzigeorgiadis, Zourbanos, Mpoumpaki, & Theodorakis, 2009). Hatzigeorgiadiset al. (2008) investigated the

effect of motivational self-talk statements (e.g., “I can do it” or “Let’s go, I got it”) on self-efficacy and tennis performance (i.e., forehand driving task) during five sessions. After the first session, in the experimental condition, participants were provided self-talk practice session for three sessions, whereas in the control condition, no self-talk practice session was provided. Results revealed that participants in the motivational self-talk group significantly increased their confidence in the given task, whereas no significant changes in self-efficacy perceptions were found in the control group.

In a similar experimental setting (Hatzigeorigiadis et al., 2009), 72 tennis players were recruited to test whether motivational self-talk statements (e.g., go, I can, and/or I am strong) influenced performance anxiety and self-confidence in a forehand driver task after implementing a 3-day self-talk training program. Consistent with findings from the previous study (Hatzigeorgiadiset al., 2008), the authors found that performance and self-confidence improved for the self-talk experimental group, whereas no changes were found in the group having no self-talk training. Results also revealed that cognitive anxiety was significantly lower for the experimental group, compared to the control group. Nonetheless, at present there has been relatively limited experimental research directly addressing the effectiveness of self-talk on building efficacy perceptions. In a recent review of the efficacy literature, Feltz, Short, and Sullivan (2008) noted that the number of studies examining the impact of self-talk in sport was ‘surprisingly low’.

Despite a couple of recent experimental investigations indicating that motivational self-talk may foster self-efficacy beliefs (Hatzigeorigiadis et al., 2008; 2009), the role of self-talk has received minimal experimental scrutiny in a group setting. Given that many activities are not performed individually, it is somewhat surprising that the literature exploring the mechanism of

self-talk on a group task remains limited. Indeed, anecdotal accounts regarding the effectiveness of self-talk in team sports have been evident in the sport psychology literature (Ronglan, 2007). From interviews with athletes playing team sports, Ronglan (2007) reported that positive self-talk strategies (i.e., positive verbal persuasion) helped enhance confidence in the capability of one's team (i.e., collective efficacy) and as well as in one's own ability. He further noted that athletes perceived that self-talk can be one of the most effective strategies to improve their team performance and collective efficacy beliefs.

In a business context, Brown (2003) investigated the impact of verbal self-guidance training (i.e., a form of self-talk intervention) on collective efficacy. Specifically, participants were allocated to small groups, and developed a series of positive self-talk scripts relating to their performance, framed using either the individual's (e.g., "*I* can finish this project in time") or the group's (e.g., "*we* can finish this project in time") capabilities. Consistent with self-efficacy theory (Bandura, 1997), the results of Brown's study showed that self-talk interventions such as these may indeed promote higher perceptions of collective efficacy. Despite the implementation of both individual- (i.e., "I") and group-focused (i.e., "we") statements in Brown's (2003) investigation, it is worth noting that self-efficacy perceptions were not measured, and as a result, it was not possible to determine the extent to which the specific *referent* of a phrase (i.e., I versus we) exerted unique effects upon self-efficacy and collective efficacy. Indeed, whilst sport-based research has considered the way in which self-talk 'direction' (i.e., facilitative self-talk – defined as self-talk designed to have a positive effect on one's ability to learn and perform, modify important cognitions such as self-efficacy, and regulate arousal and anxiety versus debilitative self-talk – defined as self-talk designed to hamper an individual's ability to achieve these same results) may influence efficacy beliefs (e.g., Cumming et al., 2006), bearing

Brown's study in mind, it may also be worthwhile to investigate how the specific frame of reference used (e.g., "we can do this" versus "I can do this") may be related individuals' social cognitions. In particular, given that each self-talk modality taps into capabilities that operate at different levels of agency, it is possible that 'individual-focused' and 'group-focused' self-talk may exert distinct effects in relation to self-efficacy (i.e., personal agency) and collective efficacy (i.e., group agency) beliefs.

To fill this gap, Son, Jackson, Grove, and Feltz (2011) examined whether motivational self-talk could help improve performance and efficacy beliefs using a team dart-throwing competition. In that experimental study, participants were allocated to small groups and given a copy of self-talk scripts that were framed using either the individual's capabilities (e.g., "*I* can perform well") or the group's capabilities (e.g., "*we* can perform well"). Lastly, in the control condition, participants were given a copy of self-talk scripts with neutral statements (e.g., "I am male/female"). The results showed that in comparison to a control group and "I"-referent self-talk group, individuals using "we"-referent motivational self-talk statements reported greater performance improvement and confidence in both their own capability and their team's capability. Son et al. (2011) suggested that the effectiveness of group-oriented self-talk in enhancing performance and confidence in one's own and team's capability can be moderated by developing a sense of unity. According to Social Identity Theory proposed by Tajfel and Turner (1979), different portions of individuals are motivating them at different times, which can rely on personal identity or social identity. A person's behavior will be affected by their positive association with their in-group, when their self-concept and/or status are elevated by that association (Hogg & Vaughan, 2001). It is possible that enhanced self-concept in being in a unit may be positively related to developing strong confidence on the group's capability. Thus, by

contributing to a sense of unity among team members and enhanced self-esteem, group-referent self-talk can foster performance improvement and both self- and collective efficacy beliefs. Therefore, the current investigation seeks to build on these recent experimental studies by considering the role of different referents of motivational self-talk statements in relation to performance, efficacy beliefs, and a sense of unity in a team competition setting. Further investigation should be needed support for the effectiveness of group-oriented self-talk and its possible mechanism.

Relationships between Efficacy Beliefs and Individualism-Collectivism

In addition to the variables that are theorized to directly underpin individuals' self-efficacy and collective efficacy perceptions (e.g., self-talk), the degree to which an individual is confident in either him/herself or his/her team may also be moderated by a number of additional factors (see Feltz et al., 2008). One personal factor that has been shown to influence the formation of efficacy perceptions in the organizational contexts relates to the extent to which people view themselves as either an 'individualist' or 'collectivist' (e.g., Earley, 1994, 1999; Oettingen, 1995; Oettingen & Zosuls, 2006; Oyserman, Coon, & Kemmelmeier, 2002). According to individualism/collectivism theorists (Wagner, 2002), the *individualist* perspective implies that (a) creating a positive sense of self and personal successes are valued, (b) well-being is derived from the attainment of personal goals, and (c) judgment, reasoning, and causal inference are primarily focused on the person. On the other hand, a *collectivist* orientation is apparent when one views oneself as, and identifies primarily with, a part of one or more groups. These theorists argue that, for collectivists, (a) one's values are reflective of group goals, such as maintaining harmonious relationships with others, (b) successfully carrying out social roles is an important source of well-being, and (c) social context, situational constraints, and social roles

figure prominently in person perception and causal reasoning. Overall, individualists are more likely to focus on personal needs, rights, and abilities, while collectivists find it natural to think about the needs, capabilities, and goals of their 'group'.

With regard to these orientations, Bandura proposed that "the influence of individualistic and collectivistic orientations… operates largely through beliefs of individual and group efficacy" (1997, p. 32). Specifically, in light of the respective tendencies, individualists are more likely to achieve high perceived efficacy and productivity when their need for independence is satisfied, whilst collectivists tend to be most efficacious when positioned within an interdependent group context. Accordingly, social psychologists have previously investigated the factors that both influence and are influenced by one's tendency to think and act in individualist or collectivist ways (e.g., Earley, 1994, 1999; Gibson, 1999; Oettingen & Zosuls, 2006; Oyserman et al., 2002).

For example, Earley (1999) investigated how individuals' individualistic and collectivistic orientation would moderate the influence of efficacy beliefs on group decisions-making processes among managers with similar experience in their field. Results revealed that in high collectivistic cultures, individuals' perception on their group's capabilities was significantly higher than did those in lower collectivistic cultures. Gibson (1999) also found that collective efficacy was a significant determinant of group effectiveness for those who reported high in collectivism but not for those with low collectivism. In an earlier study, Earley (1994) also investigated the effects of 'individual-focused' and 'group-focused' training on performance and self-efficacy among individualist and collectivist managers. The individual-focused protocol consisted of personally-relevant information (e.g., prior personal performance and personal performance enhancing strategies), whereas, whilst the group-focused intervention contained the same material, this was modified in order to emphasize group performance and group

enhancement. Results revealed that individualists performed better and perceived higher levels of self-efficacy when receiving individual-focused training compared to group-focused training. Conversely, among collectivists, group-focused training produced enhanced performance and a stronger sense of self-efficacy, suggesting that greater benefits were apparent when the intervention type (i.e., focused on the group or individual) matched the individual's orientation.

In the similar line of research in a sport context, Son (2008) examined the moderating effects for the individualism-collectivism dimension in different types (we-referent versus I-referent self-talk) of self-talk's impact on shaping self-efficacy and/or collective efficacy beliefs. Participants were assigned a group of three and asked to perform a team dart-throwing task. Although results showed no significant effects for individualism/collectivism, she argued it may be possible that individualist/collectivist orientations in sporting pursuits may differ in comparison to one's general social/organizational perceptions. Indeed, as noted by Bandura (2002), "people vary in individualistic and collectivistic social orientations depending on whether the reference group is familial, peer, academic, or national" (p. 275). The INDCOL scaled used Son's (2008) study was developed with the focus on horizontal and vertical properties of peer relations and social hierarchies which may not be relevant in sporting or exercising contexts.

In a different point of view of individualism-collectivism in a small group setting, Bellah and colleagues (Bellah, Madsen, Sullivan, Swidler, & Tipton, 1985) proposed the two differential dimensions (i.e., utilitarian versus ontological) of individualism-collectivism. According to Bellah et al. (1985) and Wagner (2002), *utilitarian individualism-collectivism* differentiates individualists from collectivists regarding the type of satisfaction being pursed between personal and shared interests and on the primary means of pursuit (i.e., individual

versus collective activities). Utilitarian individualism takes as given personnel aspirations and concerns, and sees human life as an effort by individuals to satisfy these yearnings through individualistic pursuits while utilitarian collectivism takes for granted the importance of specific shared desires and interests, and portrays human life as an effort by the members of collectives to satisfy these interests through joint pursuits (Bellah et al., 1985). On the other hand, *ontological individualism-collectivism* defines as a dimension of differences in the primacy according to individuals or groups as fundamental social entities (Wagner, 2002). Ontological individualists see a person as a whole entity and a group as an aggregate of each entity, and tend to interpret team successes and/or failure as the skills of individual team members. However, ontological collectivists perceive a group as a whole entity and an individual as partial or incomplete parts of the whole; and are more likely to seek explanations for group outcomes as joint exertion and group competencies. Based on these four dimensions, Wagner (1995) developed the I/C scale assessing an individual's individualism-collectivism orientations. The utilitarian and ontological individualism-collectivism approach is more likely to be relevant to the context used in this dissertation and the I/C scale developed by Wagner (1995) is used.

Task Types

Researchers (Feltz et al., 2008; Gibson, 1999; Goodman, Ravlin, & Schminke, 1990; Katz-Navon & Erez, 2005; Steiner, 1972) have suggested that task characteristics can potentially moderate efficacy beliefs because they are related to the type of experience that group members possess about what is required to perform effectively and the degree to which members are able to combine and integrate the experience stored by any individual member. According to Steiner (1972), additive tasks require member resources to be summed for productivity and coactive tasks refer to those in which individuals work in the real or imagined presence of others, but

outcomes depend only on the person's effort and are determined at the individual level. For example, Gibson (1999) investigated the relationship between collective efficacy and group effectiveness and the effects of task characteristics (i.e., uncertainty and interdependence) and culture on the relationship. In an experimental study, 294 undergraduate students were recruited from United States and Hong Kong and were randomly assigned to a group of 3 persons. Analyses showed that the interaction of group efficacy and task uncertainty was a marginally significant predictor of group effectiveness. That is, task uncertainty moderated the relationship between group efficacy and group effectiveness while no support was found in terms of independence or collectivism.

Gibson (1999) followed with a field study testing the moderating effects of interdependence and collectivism on the relationship between group efficacy and group effectiveness across American and Indonesian nurses. Results indicated that when task interdependence was high, group efficacy was positively related to group effectiveness, whereas when task interdependence was low, group efficacy was not related to group effectiveness. The level of collectivism moderated the relationship between group efficacy and group effectiveness.

More recently, Katz-Navon and Erez (2005) examined effects of different task types on the emergence of collective efficacy and self-efficacy. Participants were randomly assigned to three-person teams and then teams were allocated to one of two conditions: additive task condition versus high interdependent task condition. Participants were asked to complete evaluation forms for each employee. In the additive task condition, students performed the task individually and then team performance was calculated by the sum of each team member's performance. In the high interdependent task group, however, participants were instructed to work together as a group. The first performer wrote personal information about each employee,

the second person rated employees on the four characteristics and calculated the performance score, and the last performer recommended the specific merit increases based on the information from the other two group members. Team performance was determined by the number of the evaluation forms completed by the team. Results showed that collective efficacy was a significant predictor of team performance only in the high interdependent task condition while self-efficacy was highly related to individual performance when students performed the additive task. Indeed, a recent meta-analysis (Gully et al., 2002) revealed that task characteristics (i.e., task interdependence) moderated the relationship between collective efficacy and team performance. In other words, when task interdependence is high, the relationship between collective efficacy and team performance is strong.

Given that the nature of the task used in a previous self-referent versus group-referent self-talk study (Son et al., 2011) was an additive task, in which the group's potential productivity was equal to the average productivity of group members. The authors postulated that the task itself framed as a team task may contribute to enhancing collective efficacy and further discussed that the extent to which the current findings generalize to different task types (i.e., coactive tasks) is likely limited. Thus, it would be necessary to examine effects of we-referent and I-referent self-talk on shaping efficacy beliefs between the additive condition and coactive condition in which individuals are not actually working together as a group (i.e., just performing in one another's presence).

Sense of Unity

Although a substantial body of research has shown that a high degree of confidence in one's own and one's team's ability is predictive of enhanced performance in group contexts (e.g., Chow & Feltz, 2007; Heuze, Raimbault, & Fontayne, 2006; Myers, Feltz, & Short, 2004),

additional outcomes, such as sense of unity can be viewed as predictors of team successes (e.g., Bloom & Todd, 2011; Hogg & Vaughgan, 2001; Gammage, Carron, & Estabrooks, 2001; Paskevich, Brawley, Dorsch, & Widmeyer, 1999). Indeed, Hamilton, Sherman, & Nickel (2005) suggested that strong sense of being a unit among team members can help in the following ways" (a) enhance team efficacy, (b) improve cooperation and (c) consequently enhance team performance. Research has also revealed that coaches reported strong team bonding among team members as the most important factor to achieve collective goals (Bloom, Steven, & Wickwire, 2003). In sports contexts, although there has been little evidence regarding sense of unity and team outcomes, a large body of empirical research has indicated that team cohesion, which is highly linked to sense of unity, is the cornerstone for helping teams achieve success (e.g., Carron et al., 2002; Gammage et al., 2001). Team cohesion is defined as the tendency for a group to stick together and remain united in the pursuit of shared goals and/or to remain united to satisfy members' affective needs (Carron, Shapcott, & Burke, 2007). For instance, in Carron et al.'s (2002) study, 27 collegiate sport teams from soccer and basketball were assessed on their sense of cohesiveness and winning percentages. Results revealed the strong positive relationship between team success and team members' perception on team cohesion. Gammage et al. (2001) further suggested that athletes who reported a high sense of unity were more willing to participate in off-season training than those who reported low sense of unity.

Consistent to sport settings, perceptions of being on the same group have been shown to be a positive predictor of adherence behaviors in numerous exercise domains including school physical activity classes (e.g., Carron & Spink, 1993; Spink & Carron, 1994), private fitness classes (e.g., Annesi, 1999), older adults physical activity classes (Estatbrooks & Carron, 1999) and a clinical exercise setting (Fraser & Spink, 2002). Spink and Carron (1994) examined the

effects of sense of unity on adherence to 13-week exercise programs in university and private fitness club settings. In both cases, lower perceptions of unity were related to dropping out of the program, and social bonding had a stronger influence on exercise adherence in the fitness club setting.

In the similar line of research, Carron and Spink (1993) conducted a study using 17 university aerobics classes for 13 weeks. Nine were taught using a traditional approach, and eight included a team building intervention. At the end of the program, participants in the experimental group reported higher levels of individuals' attraction to the group task and satisfaction with the exercise program. Annesi (1999) also found an improvement in both team cohesion and attendance, and a lower dropout rate using a 5-7 minute team building warm-up intervention before exercise sessions at a fitness center.

Furthermore, Chow and Feltz (2007) noted that team cohesion can be predictive of individuals' confidence in their team's capability in a group context. Indeed, recent studies have consistently shown empirical evidence for positive relationships between collective efficacy and sense of cohesiveness in highly interdependent team sports such as volleyball, basketball, and rugby teams (e.g., Heuze et al., 2006; Kozub & McDonnell, 2000; Paskevich et al., 1999). Chow and Feltz (2007) noted that there has been limited literature addressing whether sense of being on the same group can contribute to building collective efficacy in lower interdependent and/or coactive sports, for example, track and field, gymnastics, and swimming relay.

Synchrony

Armies train by marching in step and religions around world incorporate synchronous singing and chanting into their rituals (Radcliffe-Brown, 1922). Even in sport, it is common to see synchronous activities before a competition, such as, the New Zealand all Blacks Haka –

performed immediately prior to the game by New Zealand national rugby team, which has been viewed as a greatest ritual in world sport (Jackson & Hokowhitu, 2002). Indeed, researchers suggest that behavioral synchrony enhances a sense of "oneness" that bonds people together and so acting in synchrony with others can foster cooperation within groups by strengthening group members' sense of unity. (McNeill, 1995; Wiltermuth & Heath, 2009). According to Kimura and Daibo (2006), *behavioral synchrony* refers to the coordination of movement that occurs between individuals during a social interaction, featuring similarity of (a) form-the manner and style of movements, and (b) time-the temporal rhythm of movements. Synchrony theorists have suggested that engaging in synchronous physical activity (i.e., muscle bonding) with another individual can foster a stronger sense of social bonding compared to engaging in asynchronous physical activity (Ehrenreich, 2006; McNeill, 1995). Indeed, an increasing body of recent studies on synchrony reveal its positive impact on compassion (Valdesolo & DeSteno, 2011), cooperation and a sense of unity (Wiltermuth & Heath, 2009), affiliation (Hove & Risen, 2009), affective states (Haidt, Seder, & Kesebir, 2008), emotional support (Jones & Wirtz, 2007), relationship quality (Vacharkulksemsuk & Fredrickson, 2011), and even elevated pain thresholds (Cohen, Ejsmond-Frey, Knight, & Dunbar, 2010).

For example, Vacharkulksemsuk and Fredrickson (2011) examined the emergence of behavioral synchrony among stranger-stranger dyads in self-disclosure contexts and its relationship with interaction quality. A total of 94 same-sex pairs were assigned to a video self-disclosure or control condition and then were asked to rate the quality of their social interaction. Results revealed that when stranger-stranger dyads worked together, synchronous activities improved social connection quality. In a similar line of research, Hove and Wirtz (2009) also tested the effect of interpersonal synchrony on affiliation. Participants were randomly assigned to

one of three conditions: (a) synchrony, (b) asynchrony, and (c) control, and asked to match finger movement with a visual moving metronome. Analyses indicated that the greatest sense of affiliation reported in a synchrony condition, compared to either asynchronous or control conditions. Consistent with previous studies, Mueller and his colleagues (Muller, Agamanolis, &n Picard, 2003) found that synchronized physical activity fostered positive mood states and enhanced a sense of social bonding when two strangers who never met, played a physically exhausting ball game together using video game-conference settings.

More recently, Wiltermuth and Heath (2009) conducted three experimental studies testing the effects of synchrony. In their first study, 30 participants in a group of 3 were recruited to examine effects of synchronous activity on cooperation, social connection, and collective happiness. In the synchrony condition, participants walked in step while those in the control condition walked normally. They were then asked to perform the weak link coordination exercise in which each participant chose a number from 1 to 7 without communicating. Payoffs increased as a function of the smallest number chosen and decreased with the distance between the participant's choice of number and the smallest number chosen in the group. Participants played six rounds of the game and were paid based on the outcomes of a round chosen at random following the competition of the last round. Results revealed that participants who walked in step selected higher numbers (i.e., higher cooperation) in the first round than did those who walked normally. A greater sense of connection to their team member and trust in their counterparts was found in the synchrony condition compared to the control condition while no difference was found in level of happiness between the two groups. In Study 2, they explored the relationships between synchrony and team cohesion. In the experiment, the experimenter verbally referred to the participants as a group, and group members performed the task as a group and got the reward

based on team outcomes. Participants were randomly assigned to one of four conditions (synchronous singing and moving, synchronous singing, asynchronous singing and moving, no singing and no moving). In synchrony conditions, participants reported greater feelings of being on the same team and cooperation compared to the control condition. The greatest team outcomes were produced in the synchronous singing and moving condition. Their third study was to examine whether after having been in synchrony with others, individuals may contribute more to a public account. They found that synchrony influenced contributions to the public account more persistent over time. That is, there was a significant decline in contributions to public account across the time among individuals in asynchronous conditions, whereas no corresponding decline occurred in the synchrony condition.

Lakens (2010) examined synchrony effects on perceived entitativity among dyads. Participants were asked to perform the waving motion presented in the screen in front of them with their partner and the entitativity scale was completed right after the synchronous waving motion. This study supported hypothesis that movement synchrony was an important antecedent of perception of being a unit. More specifically, synch in waving motion produced higher on entitativity compared to waving motion in a dissimilar rhythm.

In sport-specific contexts, Cohen and her colleagues (Cohen et al., 2010) investigated whether behavioral synchrony can simulate the release of endorphins in a group of rowers who trained and competed together as a squad in a world class sweep-oar racing. Twelve rowers were assigned to either group or individual conditions and performed on erogometers twice. Similar results showed that group-row training significantly increased pain threshold compared with training alone while rower's power output was not different in both conditions. Despite such empirical and anecdotal evidence of synchrony effects, it is worth noting that there is limited

evidence to test whether synchronous activity can enhance group performance and efficacy beliefs. Knowing that team cohesion, positive emotions, and relationship quality can be predictive of efficacy beliefs and team success (e.g., Allen, Jones, & Sheffield, 2009; Jackson, Beauchamp, & Knapp, 2007; Kozub & McDonnell, 2000), it may also be worthwhile to investigate how synchronous activity can be related to individuals' beliefs in their team's capability and group performance improvement. Thus, the current study is designed to test synchrony effects, as well as the role of different referents of motivational self-talk statements on group performance, efficacy beliefs and a sense of unity.

In addition to the lack of empirical evidence on effects of synchrony on group performance and efficacy beliefs, the majority of previous literature on synchrony has investigated effects of synchrony in coactive settings (e.g., Cohen et al., 2010; Hove & Risen, 2009; Muller et al., 2003; Vacharkulksemsuk & Fredrickson, 2011). Given that many tasks are performed at a group level and require successful group attainments, it is very surprising that little research has been conducted on synchrony effects on group effectiveness at different task settings such as additive task or conjunctive tasks. Wiltermuth and Heath (2009) also found that synchronous activity increased team cooperation and team cohesion in additive group task. As different characteristics of task my require different level of cooperation, team effort, and/or motivation to attain team outcomes, it is also worth noting that further investigation should be needed whether task types can vary impacts of synchrony on efficacy beliefs and sense of unity.

Summary

A growing body of research has verified the positive effects of self-talk on increasing efficacy beliefs and performance at group settings. However, limited studies have attempted to offer insight into how different referents of self-talk enhance group performance, efficacy beliefs,

and group cohesion and the extent to which tendencies toward individualism and collectivism may combine with self-talk strategies in order to determine personal and group efficacy beliefs. Additionally, the developing literature on synchrony has suggested significant synchrony effects on desirable group outcomes (e.g., group cohesion, cooperation, and affiliation). Nevertheless, little has known about whether synchronous activity can enhance team performance and efficacy beliefs at different task settings (coactive versus additive setting).

CHAPTER 3

METHOD

Participants

A total of 346 undergraduate students (289 males and 52 females) were recruited in this study on a voluntary basis. Participants were students who were enrolled in physical activity classes (e.g., aerobics, step aerobics, and general conditioning) offered by the Kinesiology department at MSU and received additional course credit for their participation. Participants were randomly assigned to same-gender dyads within a class, and then dyads were allocated to one of 12 conditions. None of the participants reported any physical impairment that would have limited their participation in this study. Prior to data collection, procedures were approved by the university's Human Research Ethics Committee, and all participants gave their written, informed consent.

Design

The experiment used a 3 (self-talk condition: I version, we version, control) x 2 (synchrony: synchronous activity, asynchronous activity) x 2 (task type: additive, coactive condition) x 2 (block) design with repeated measures on the last factor. This resulted in the following 12 conditions:

"we" Self-talk conditions

Synchrony – additive task condition

Synchrony – coactive task condition

Asynchrony – additive task condition

Asynchrony – coactive task condition

"I" Self-talk conditions

Synchrony – additive task condition

Synchrony – coactive task condition

Asynchrony – additive task condition

Asynchrony – coactive task condition

Control conditions

Synchrony – additive task condition

Synchrony – coactive task condition

Asynchrony – additive task condition

Asynchrony – coactive task condition

Task and Measures

Task Performance. The abdominal plank exercise was used for this study. This is an isometric persistence task that requires little motor coordination. Participants were asked to perform an exercise targeting the abdominal muscles in two blocks. Participants were faced down on a mat with legs stretched straight and their body lifted up by putting their elbows and toes on the mat. The first baseline block was performed individually while the second block was performed simultaneously with their partner. Performance was calculated as the total number of seconds that the exercise was held. Team scores were calculated by the sum of group members. Team scores were calculated for the purpose of feedback for participants in the additive conditions. For the data analyses, only individual scores were used.

Individualism-collectivism (I/C). Personal orientations in individualism/collectivism was measured with the multi-dimensional I/C scale developed by Wagner (see the Appendix A; 1995). The I/C scale contains 20 items and measures five dimensions of I/C: self-reliance (five items, e.g., “If you want to get something done, you got to do it yourself”),competitiveness (five

items, e.g., “Winning is important in work and games”), supremacy of individual goals (three items, e.g., “Group is more productive when members follow their own interest”), supremacy of individual interests (four items, e.g., “People who belong to a group should realize that they are not always going to get what they want”), and solitary work preferences (four items, e.g., “Given the choice, I would rather work alone than in a group”). Responses were made on a 7-point scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*), and overall mean scores for each dimension are computed. Reliability and validity evidence for the I/C scale revealed acceptable internal consistency values for each subscale (Ramamoorthy & Carroll, 1998; Ramamoorthy, Gupta, Sardessai, & Flood, 2005; Wagner, 1995). In addition, a few subsequent studies have provided evidence of validity relating to the I/C dimensions across different cultural contexts, for example, the United States (Ramamoorthy & Carroll, 1998; Wagner, 1995), Ireland, and, India (Romamoorthy et al., 2005).

Self-efficacy. Task self-efficacy was measured with a modified version of the scale administered in a previous study (Son et al., 2011), which used a similar experimental design (see Appendix B). The scale consists of nine items corresponding to the plank exercise within each trial. To assess self-efficacy perceptions, participants were asked “For this plank abdominal exercise, please rate your confidence for how many seconds that you can hold this exercise?” Nine progressively higher points totals were then displayed, 1 minute, 1 minute and 10 seconds, 1 minute 20 seconds, 1 minute 30 seconds, 1 minute 40 seconds, 1 minute 50 seconds, 2 minutes, 2 minutes 10 seconds, and 2 minutes and 20 seconds. Responses to each of the nine difficulty levels were scored on an 11-point scale, from 0 (*not at all confident*) to 10 (*very confident*), and individual responses were averaged in order to produce an overall self-efficacy score. The survey was completed at two time points; (a) before Trial 1 (after watching a brief instructional video

demonstrating the exercise, and (b) after performing Trial 1 and implicating self-talk. Internal consistency analyses revealed a Cronbach alpha of 0.97 for the nine baseline self-efficacy items.

Collective Efficacy. Collective efficacy was assessed using the same format that was used to measure self-efficacy, however in this case the frame of reference was modified to directly assess perceptions about team capabilities (see Appendix B). Participants were asked "For this plank exercise, please rate your confidence for how many seconds (sum of seconds) that YOU and YOUR PARTNER can hold this exercise together?" Responses were made using the same rating scale as described previously and also the measure was administered at two time points as well. Internal consistency analyses revealed a Cronbach alpha of 0.96 for the nine baseline collective-efficacy items.

Sense of Unity. In order to assess synchrony and type of self-talk on sense of unity, participants were asked "How much did you feel you were on the same team with your partner?" (Wiltermuth & Health, 2009) using a 7-point Likert scale (1 = *not at all*, 7 = *very much*). For this dissertation, two additional questions assessing the sense of unity were developed: "How much did you think of your partner as a teammate" and "How much did you enjoy working together with your partner?" using the same 7-point Likert scale (see Appendix C). The sense of unity was measured after performing Trial 1 and implicating self-talk. Internal consistency analyses revealed a Cronbach alpha of .84 for the three items.

Demographics. A brief demographic questionnaire was administered at the end of the study that included basic demographic questions such as age, gender, and ethical identity, sport involvement (see Appendix E).

Manipulations

Self-talk Intervention. Based on previous research exploring the characteristics of self-talk in exercise and motor performance (Gammage, Hardy, & Hall, 2001; Son et al., 2011), five individually-referenced motivational self-talk statements, five group-referenced motivational self-talk statements, and five neutral (i.e., control) statements were generated. The individually-referenced and group-referenced self-talk statements were identical in content except for the referent of the statement (e.g., "I [We] can do it", "I [We] will do my [our] best", "I [We] will keep pushing myself [ourselves] to go", "Keep it up, I am [we are] almost done", and "I am [We are] confident to hold this exercise longer"). The neutral statements, on the other hand, made no reference to one's level of skill, ability, or performance on the upcoming task (e.g., "I live in Michigan, "I am a student at MSU", "I am a male/female", "I am __(age)_years old", and "I have _(colors)__eyes").

Self-talk Manipulation Check. The manipulation check for the participants' overt self-talk consisted of the following question: Did you use the statements that you recorded and listened to as self-talk? If yes, were the statements helpful to decrease your level of pre-competition anxiety? (see Appendix D). Responses were made on a 10-point scale anchoring from 1 (*not at all*) to 10 (*very helpful*).

Synchrony Manipulation. In synchrony conditions, dyads were asked to perform 10 repetitions of a squat exercise at the same time in cadence with a visual moving metronome (40 beats per a minute). In asynchrony conditions, dyads performed the same exercise with the same tempo as those in synchrony condition do, however, in order to control the potential synchrony effect, they started to perform the task at a different time. That is, one person starts to perform the given exercise first and 5 seconds later, the other person starts. In this case, a metronome,

which was set at the same tempo was given to each individual.

Partnered Task Conditions. For the additive condition, participants were instructed that they would be working as a team in the second block of the task and their team score would be calculated by the sum of seconds each of them holds the plank exercise. This information was given two times (very beginning of the procedure and right after the first block of exercise was done). For coactive condition, participants were instructed that they would be performing the task simultaneously with the person at the second block of task. No emphasis was made about team or team score.

Procedure

Upon approval of the Institutional Review Board, prospective participants were informed about "a study on self-talk and dyad exercise" during undergraduate classes. Those who volunteered in this research were randomly assigned to a same gender dyad within their class and then allocated to one of 12 conditions. Prior to starting the experiment, seven research assistants who were mostly senior or junior in Kinesiology majors were recruited and completed the IRB training. All of them completed five training sessions (two sessions – shadowing the primary investigator and three sessions – dry run under the supervision and data from these dry runs were eliminated for data analysis process). Similar number of dyads (see Table 1) were then randomly created within each experimental condition and scheduled for testing. A dyad reported to the laboratory at the same time. Upon arrival for testing, respondents were asked to read and sign informed consent forms and to introduce each other by sharing their personal information (e.g., major, hometown, and favorite music). Participants were given instructions about the task and procedures and then the I/C scale and a baseline measure of self-efficacy and collective efficacy

was completed. Participants were not told the exact number of trials they would be performing, but only that they would perform a series of trials.

Each participant then individually performed the first block of exercises, holding each exercise as long as possible. While one participant performed the first block, the other member was asked to wait his/her turn in the waiting room near the lab. After completing their baseline exercise, participants were provided with a written copy of their randomly assigned self-talk script, which they were asked to record in digital form on a computer in an "enthusiastic and believable" manner. When they were satisfied with the quality of the recorded self-talk script, participants were instructed to go back to the waiting room. And then the other member was asked to come to the lab and to complete the same procedure. Once all members had recorded their self-talk script, they were brought to the laboratory and instructed to listen to their own recording simultaneously for a period of 2 min. Then the synchrony intervention was implemented.

Individuals in the additive condition were then made aware of their own and their team's score from the first block. However, those in the coactive condition were made aware of only their own and their partner's score. Participants were asked to complete the self-efficacy and collective efficacy measures and the sense of unity questionnaire. After completing all measures, each team member performed the second block together. All participants were instructed to ensure throughout that their actual self-talk statements (a) mirrored those that were being listened to, and (b) were performed covertly if they could. When the dyad completed its second block, participants were also asked to complete a self-talk manipulation check and demographic questionnaire. Lastly, the participants were debriefed, given an opportunity to ask questions, and thanked for their involvement.

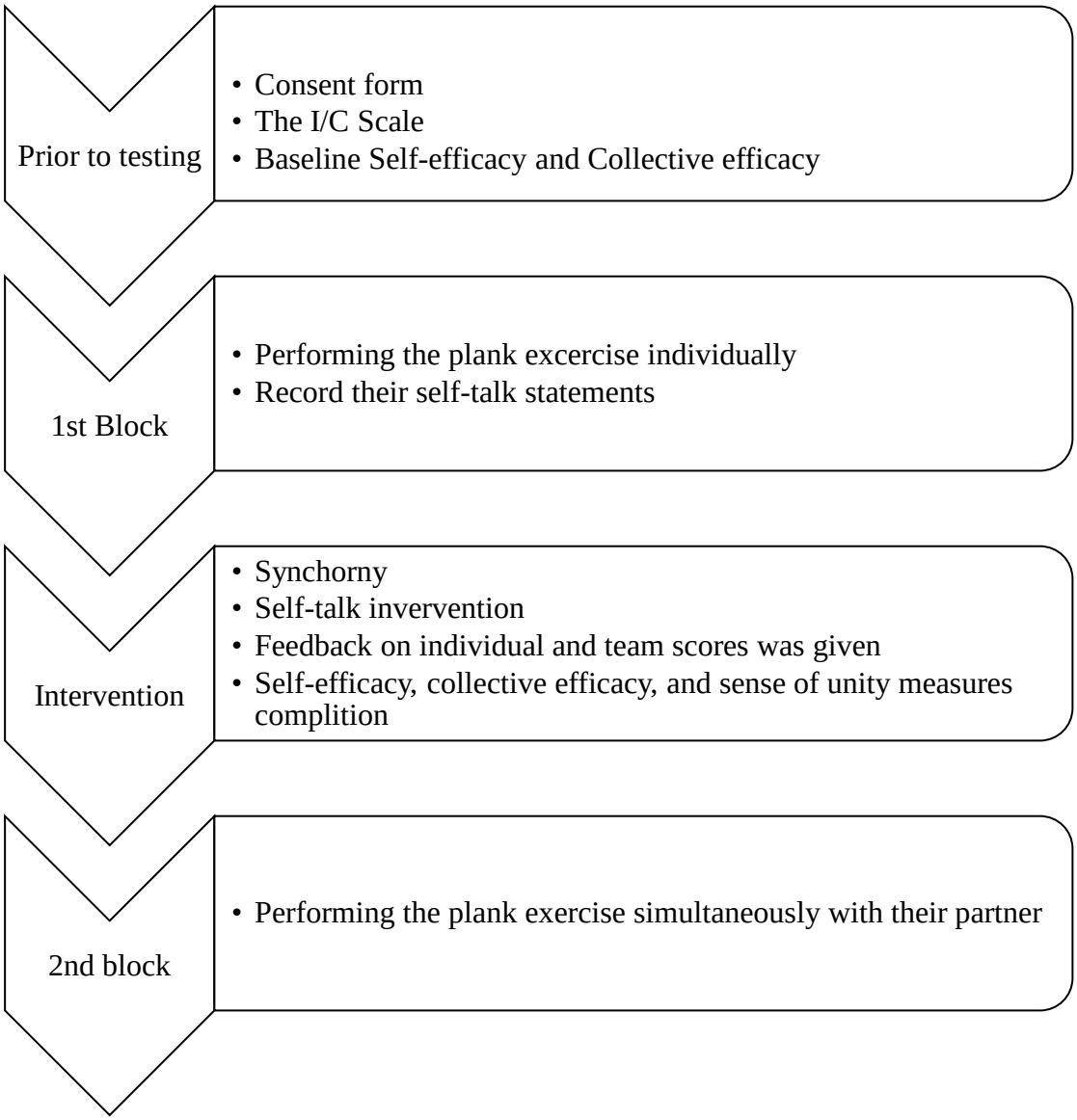

Figure 1. *Procedure diagram*

Table 1. *Number of dyads across conditions*

Conditions	*N*
"we" Self-talk conditions	
Synchrony – additive task condition	18
Asynchrony – additive task condition	15
Synchrony – coactive task condition	15
Asynchrony – coactive task condition	15
"I" Self-talk conditions	
Synchrony – additive task condition	15
Asynchrony – additive task condition	15
Synchrony – coactive task condition	15
Asynchrony – coactive task condition	10
Control conditions	
Synchrony – additive task condition	13
Asynchrony – additive task condition	16
Synchrony – coactive task condition	15
Asynchrony – coactive task condition	11

Treatment of Data

Before conducting the primary analyses, the data were screened for outliers, normality, and linearity. Following data screening, descriptive statistics (i.e., mean and standard deviation) and bivariate correlations were calculated for all independent and dependent variables. One-way between-subjects analyses of variance (ANOVA) were performed to check the mean differences for baseline self-efficacy, collective efficacy, sense of unity, and individualism-collectivism

across all experimental conditions. One-way ANOVAs were also administered to find out significant differences in mean hours of current sport involvement, types of sport involvement, and baseline performance across three self-talk conditions.

As an exploratory analysis, a full-factorial 3 (self-talk condition: I version, we version, control) x 2 (task type: additive and coactive condition) x 2 (synchrony: synchronous activity versus asynchronous activity) x 2 (block: first versus second) repeated measure ANCOVA was used with individualism-collectivism as the covariate. All statistical analyses were conducted in SPSS 20 and an alpha level of .05 is used for all statistical tests.

CHAPTER 4

RESULTS

The purpose of this study was to examine the effect of self-talk and synchrony on performance, efficacy beliefs, and a sense of unity in a dyadic exercise setting. This chapter was organized into three main sections. The first section provides results on demographic, descriptive, and manipulation check statistics. The second section provides results on preliminary analyses used to inform the main analyses. The third section provides results on the main hypotheses.

Descriptives and Manipulation Check

Means and standard deviations for all dependent variables are presented in Table 2 and Across all 12 experimental conditions, means and standard deviations for the second block performance (see Table 3), the second block self-efficacy (see Table 4), the second block collective efficacy (see Table 5) and sense of unity (see Table 6) are presented. A total of 346 participants (290 males and 56 females) ranged in age from 18 to 30 years (M = 19.9 years, SD = 1.70) and roughly, 68% (n = 234) were Caucasian, 19% (n = 66), Black/African-American, 5 % (n = 18), Hispanic, and Asian, 5 % (n = 17). Almost 75 % of them (n = 260) reported to participate regularly in sport and exercise activities and they, on average, reported 8.17 h (SD = 8.54) of sport participation per two-week period. In terms of types of sports activity involvement, about equal numbers of students participated in individual-based sport activities (n = 113), group-based sport activities (n = 106), and both individual and group activities (n = 101).

Table 2. *Descriptive statistics*

Variable	Min	Max	M	SD
Age	18	30	19.90	1.70
Sport Participation	0	40	8.17	8.54
Self-reliance	1	7	3.51	1.25
Competitiveness	1	7	3.71	1.37
Supremacy of individual goals	1	7	4.43	1.39
Supremacy of individual interests	1	7	5.43	1.22
Solitary work preference	1	7	2.52	1.20
Baseline performance	19	298	103.47	43.28
Performance	33	504	107.72	45.86
Baseline self-efficacy	1	11	5.94	2.54
Self-efficacy	1	11	7.86	2.73
Baseline collective efficacy	1	11	5.76	2.40
Collective efficacy	1	11	7.29	2.78
SU	1	7	5.61	1.42

Note. Sport involvement = hours of participation in sport and exercise activities per fortnight. Performance = performance scores in the second block. Self-efficacy = self-efficacy ratings for the second block. Collective efficacy = collective efficacy ratings for the second block. SU = sense of unity.

Table 3. *Performance scores across conditions*

Conditions	*First block M (SD)*	*Second block M (SD)*
"we" Self-talk conditions		
Synchrony – additive task condition	106.37 (41.37)	121.67 (47.60)
Asynchrony – additive task condition	94.90 (33.11)	100.63 (44.53)
Synchrony – coactive task condition	109.42 (34.30)	106.92 (25.75)
Asynchrony – coactive task condition	103.29 (46.17)	108.93 (43.16)
"I" Self-talk conditions		
Synchrony – additive task condition	97.58 (39.23)	126.69 (89.71)
Asynchrony – additive task condition	93.20 (38.49)	103.74 (48.17)
Synchrony – coactive task condition	116.67 (47.22)	123.86 (43.93)
Asynchrony – coactive task condition	109.40 (50.67)	76.15 (12.77)
Control conditions		
Synchrony – additive task condition	107.09 (37.72)	101.86 (31.02)
Asynchrony – additive task condition	96.04 (45.19)	101.96 (94.67)
Synchrony – coactive task condition	117.00 (57.06)	115.72 (41.26)
Asynchrony – coactive task condition	85.08 (23.75)	94.67 (37.61)

Table 4. *Self-efficacy scores across conditions*

Conditions	*First block M (SD)*	*Second block M (SD)*
"we" Self-talk conditions		
Synchrony – additive task condition	5.46 (2.90)	8.13 (2.88)
Asynchrony – additive task condition	5.15 (2.19)	8.10 (2.25)
Synchrony – coactive task condition	6.19 (2.59)	8.13 (2.40)
Asynchrony – coactive task condition	4.89 (2.47)	6.91 (3.34)
"I" Self-talk conditions		
Synchrony – additive task condition	6.14 (2.43)	8.27 (2.57)
Asynchrony – additive task condition	5.94 (2.09)	7.41 (2.76)
Synchrony – coactive task condition	6.02 (2.95)	7.96 (2.89)
Asynchrony – coactive task condition	5.76 (2.05)	7.94 (2.85)
Control conditions		
Synchrony – additive task condition	5.76 (2.79)	8.00 (3.19)
Asynchrony – additive task condition	6.16 (3.09)	7.70 (2.90)
Synchrony – coactive task condition	7.35 (2.39)	8.51 (2.31)
Asynchrony – coactive task condition	6.04 (1.75)	6.46 (1.99)

Table 5. *Collective efficacy scores across conditions*

Conditions	*First block M (SD)*	*Second block M (SD)*
"we" Self-talk conditions		
Synchrony – additive task condition	5.62 (1.89)	8.11 (2.28)
Asynchrony – additive task condition	5.86 (2.27)	8.00 (2.40)
Synchrony – coactive task condition	5.43 (2.68)	6.70 (2.31)
Asynchrony – coactive task condition	4.71 (2.37)	6.49 (3.23)
"I" Self-talk conditions		
Synchrony – additive task condition	6.22 (2.49)	7.50 (2.97)
Asynchrony – additive task condition	5.95 (1.83)	7.70 (2.26)
Synchrony – coactive task condition	5.08 (3.10)	6.72 (3.21)
Asynchrony – coactive task condition	4.99 (2.27)	6.73 (2.35)
Control conditions		
Synchrony – additive task condition	5.78 (1.89)	7.97 (2.45)
Asynchrony – additive task condition	6.16 (3.09)	8.64 (2.37)
Synchrony – coactive task condition	5.13 (2.34)	7.99 (2.38)
Asynchrony – coactive task condition	6.04 (1.75)	5.01 (3.31)

Table 6. *Sense of unity scores across conditions*

Conditions	*M (SD)*
"we" Self-talk conditions	
Synchrony – additive task condition	5.92 (1.09)
Asynchrony – additive task condition	5.30 (1.46)
Synchrony – coactive task condition	5.44 (1.15)
Asynchrony – coactive task condition	5.29 (1.36)
"I" Self-talk conditions	
Synchrony – additive task condition	5.23 (1.53)
Asynchrony – additive task condition	5.19 (1.59)
Synchrony – coactive task condition	5.05 (1.03)
Asynchrony – coactive task condition	5.29 (1.36)
Control conditions	
Synchrony – additive task condition	5.46 (1.30)
Asynchrony – additive task condition	5.20 (1.75)
Synchrony – coactive task condition	5.23 (1.58)
Asynchrony – coactive task condition	5.21 (1.46)

Correlations. Bivariate correlations were calculated among all variables (see Table 7). With respect to individualistic and collectivistic orientations, self-reliance was positively related to competitiveness ($r = .34$, $p < .001$) and baseline self-efficacy ($r = .11$, $p < .05$); whereas, negative correlations were found between self-reliance and individuals' perception about their partner as a teammate ($r = -.13$, $p < .05$) and between self-reliance and enjoyment working together with their partner ($r = -.15$, $p < .01$). Competitiveness was positively correlated with solitary work preference ($r = .29$, $p < .001$), baseline performance ($r = .15$, $p < .01$), baseline self-efficacy ($r = .21p < .001$), baseline collective efficacy ($r = .21$, $p < .001$), the second block self-efficacy ($r = .12$, $p < .05$), and the second block collective efficacy ($r = .13$, $p < .05$). Although positive correlations were found between supremacy of individual goals and supremacy of individual interests ($r = .15$, $p < .01$) and between supremacy of individual interests and enjoyment working together with their partner ($r = .16$, $p < .01$), supremacy of individual interests were found to be negatively correlated to solitary work preference ($r = -.47$, $p < .001$) and baseline self-efficacy ($r = -.11$, $p < .001$).

Consistent with previous literature on efficacy beliefs (e.g., Bandura, 1997; Feltz et al., 2008), baseline performance was significantly correlated with baseline self-efficacy ($r = .44$, $p < .001$) and baseline collective efficacy ($r = .32$, $p < .001$) and as well as, the second block performance was strongly related to the second block self-efficacy ($r = .57$, $p < .001$) and the second block collective efficacy ($r = .40$, $p < .001$). Strong positive correlations were found between two baseline efficacy measures ($r = .63$, $p < .001$) and the two second block efficacy measures ($r = .68$, $p < .001$).

Table 7. *Correlations*

	1	2	3	4	5	6	7	8	9	10	11	12
1. SR	-	.34**	.01	-.11	.36	-.01	.11*	.05	.03	.04	-.02	-.04
2. Com		-	.04	.04	.29**	.15**	.21**	.21**	.10	.12*	.14*	.05
3. SIG			-	.15**	.08	.01	.03	.07	.05	.06	-.03	-.05
4. SII				-	-.47**	.04	-.11*	.03	.03	.01	.05	.18*
5. SWP					-	-.10	.21**	.10	-.11*	.01	-.09	-.06
6. BP						-	.49**	.32**	.70**	.70**	.49**	.06
7. BSE							-	.63**	.44**	.58**	.36**	.01
8. BCE								-	.33**	.38**	.56**	.04
9. P									-	.57**	.40**	.09
10. SE										-	.68**	.08
11. CE											-	.09
12. SU												-

Note. *. $p < .05$; **. $p < .001$. SR = self-reliance, Com = competitiveness, SIG = supremacy of individual goals, SII = supremacy of individual interests, SWP = solitary work preference, BP = baseline performance, BSE = baseline self-efficacy, BC = baseline collective efficacy, P = performance in the second block, SE = self-efficacy rating for the second block, CE = collective efficacy rating for the second block, SU = sense of unity.

Manipulation Check. Responses to the question, "Did you use the statements that you recorded and listened to as self-talk?" revealed that 78% of motivational self-talk participants in the group self-talk condition (N = 78) and the individual self-talk condition (N = 80) reported that the given self-talk statements were used for their actual self-talk. They also reported that the assigned self-talk statements were helpful to increase their confidence in their own performance (M = 6.31, SD = 2.28) and their group performance (M = 6.45, SD = 2.36).

Preliminary Analyses

A check of the data revealed all dependent variables to be normally distributed. One-way analyses of variance (ANOVAs), using self-talk conditions as a between subjects variable, revealed that there were no significant differences in (a) age, F (2, 277) = .39, p = .67, (b) types of sport participation, F (2, 277) = 2.04, p = .13, or (c) mean hours of current sport involvement, F (2, 277) = 0.33, p = .72, among the three self-talk conditions. No mean differences between the two task types were found in (a) age, F (1, 277) = .51, p = .48, (b) types of sport participation, F (1, 277) = .07, p = .79, or (c) mean hours of current sport involvement, F (1, 277) = .80, p = .37. ANOVAs, using synchrony conditions as a between subjects variable, also revealed that there were no significant differences in (a) age, F (1, 277) = .07, p = .79, (b) types of sport participation, F (1, 277) = 1.42, p = .24, or (c) mean hours of current sport involvement, F (1, 277) = 1.32, p = .25. Regarding individualistic and collectivistic orientations, across experimental conditions , no significant differences were found in (a) self-reliance, for self-talk, F(2, 324) = 1.76, p = .17, for task type, F(1, 324) = .01, p = .91, for synchrony, F(1, 324) = .13, p = .72, (b) competitiveness, for self-talk, F(2, 324) = 1.67, p = .19, for task type, F (1, 324) = .35, p = .56, for synchrony, F (1, 324) = .37, p = .55, (c) supremacy of individual goals, for self-talk F (2, 324) = 2.33, p = .10, for task type, F (1, 324) = 1.85, p = .18, for synchrony, F (1, 324) =

3.45, p = .06, (d) supremacy of individual interests, for self-talk, F(2, 324) = .44, p = .65, for task type, F (1, 324) = .28, p = .56, for synchrony, F (1, 324) = 3.30, p = .07,or (e) solitary of work preference, for self-talk, F (2, 324) = .76, p = .47, for task type, F (1, 324) = .10, p = .76, for synchrony, F(1, 324) = .64, p = .43.

A series of ANOVAs were run to check the mean differences in baseline measures. An ANOVA, using the three self-talk conditions as a between subjects variable showed non-significant mean differences in baseline performance, F (2, 268) = .20, p = .98 whereas significant mean differences found in baseline self-efficacy, F (2, 268) = 3.36, p = .04, and baseline collective efficacy, F (2, 268) = 4.20, p = .02. Compared to those in the group-focused self-talk condition (M = 5.43, SD = 2.59), participants in the control condition reported significantly greater level of baseline self-efficacy (M = 6.42, SD = 2.56). And, collective efficacy scores in the control condition (M = 6.42, SD = 2.56) was higher in group self-talk condition (M = 5.41, SD = 2.30 and). Means and standards by the three self-talk conditions were displayed in Table 8.

Across task type conditions, the results of ANOVAs showed no mean differences in baseline performance, F (1, 269) = 3.14, p = .08, or baseline self-efficacy, F (1, 269) = .95, p = .33. Nevertheless, there was a significant difference in baseline collective efficacy between additive and coactive conditions, F (1, 269) = 4.18, p = .04. As illustrated in Table 8, participants in the additive task condition (M = 7.82, SD = 2.58) perceived higher confidence in their team's ability than those in the coactive task condition (M = 6.67, SD = 2.83).

Lastly, the same ANOVA, using the synchrony conditions as a between subjects variable was run. Although there were no mean differences in baseline self-efficacy, F (1, 269) = 2.78, p = .10, or baseline collective efficacy, F (1, 269) = .53, p = .47, the mean of baseline performance

was significantly different between the two synchrony conditions, F (1, 269) = 5.11, p = .04. Compared to the asynchrony condition (M = 101.69, SD = 41.95), individuals in the synchrony conditions held the plank exercise longer (M = 115.22, SD = 51.26; see Table 8). Because a couple of significant mean differences were found in baseline dependent variables across the experimental conditions, these baseline measures would be additionally entered to main analyses as a covariate.

Table 8. *Means and standard deviations for dependent variables by self-talk, synchrony, and task type*

	Self-talk		Synchrony		Task type			
	Group	Individual	Control	Synchrony	Asynch	Additive	Coactive	Total
	n = 110	*n* = 90	*n* = 82	*n* = 147	*n* = 124	*n* = 149	*n* = 122	*n* = 346
Variables	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
Baseline performance	103.84 (39.11)	102.76 (43.37)	103.52 (45.65)	108.70 (43.24)	97.10 (40.71)	99.28 (39.22)	108.42 (45.69)	103.47 (43.28)
Performance	109.89 (42.15)	113.61 (59.19)	103.06 (39.50)	115.22 (51.26)	101.69 (41.95)	110.22 (53.06)	107.60 (40.75)	107.72 (45.86)
Baseline self-efficacy	5.43 (2.59)	5.66 (2.46)	6.42 (2.56)	6.14 (2.70)	5.63 (2.37)	5.77 (2.59)	6.07 (2.54)	5.94 (2.54)
Self-efficacy	7.85 (2.77)	7.79 (2.74)	7.95 (2.74)	8.10 (2.73)	7.58 (2.71)	7.88 (2.75)	7.83 (2.71)	7.86 (2.73)
Baseline collective efficacy	5.41 (2.30)	5.66 (2.46)	6.42 (2.56)	5.90 (2.46)	5.68 (2.40)	6.07 (2.18)	5.47 (2.67)	5.76 (2.40)
Collective efficacy	7.27 (2.67)	7.79 (2.74)	7.63 (2.77)	7.43 (2.70)	7.19 (2.81)	7.82 (2.58)	6.76 (2.83)	7.29 (2.78)
SU	5.50 (1.26)	5.28 (1.32)	5.15 (1.59)	5.35 (1. 49)	5.28 (1.29)	5.62 (1.47)	5.42 (1.33)	5.20 (1.47)

Note. SU = sense of unity.

Hypothesis Testing

The main hypotheses made predictions regarding the effectiveness of different forms of motivational self-talk and synchrony on performance, self-efficacy, collective efficacy, and a sense of unity between additive and coactive conditions. The second purpose of this study was to examine whether self-talk effects may differ by individuals' individualistic and collectivistic orientations. Thus, the first hypotheses tested for individualistic and collectivistic orientations as a covariate of type of self-talk on performance, self-efficacy, collective efficacy, and unity to determine whether this variable was a necessary to control variable. For simplicity, univariate analyses were conducted using the factorial design and a single dependent measure.

Type of Self-talk Hypotheses. Hypothesis 1a stated that controlling for individualistic and collectivistic orientations, performance improvement will be greater in a group-oriented self-talk condition than an individual-oriented condition. To examine H1a, a series of one-way between ANCOVAs were run, with baseline performance and the five factors of individualistic and collectivistic orientations (i.e., (a) self-reliance, (b) competitiveness, (c) supremacy of individual interests, (d) supremacy of individual goals, and (e) solitary work preference) entered as a covariate. Prior to running analyses, preliminary tests revealed that the assumption of homogeneity in regression slopes was not violated for all of six covariates, thus, a series of one-way between ANCOVAs with baseline performance and each of five factors of individualistic and collectivist orientations as a covariate, were run to test self-talk effects on performance improvement. Results revealed no significant covariate effects for the five factors of individualistic and collectivistic orientations; (a) self-reliance, $F(1, 330) = 1.14$, $p = .29$, $\eta_p^2 = .003$, (b) competitiveness, $F(1, 337) = .02$, $p = .90$, $\eta_p^2 < .001$, (c) supremacy of individual goals, $F(1, 339) = 1.60$, $p = .21$, $\eta_p^2 = .005$, (d) supremacy of individual interests, $F(1, 334)$

= .004, p = .92, η_p^2 < .001, or (e) solitary work preference, $F(1, 337) = .59$, p = .44, η_p^2 = .002. Since the model fit (r^2 = .52) did not change without each of these covariates, all of the five factors of individualistic and collectivistic orientations were eliminated in the further analyses.

Finally, to examine the mean difference in the second block performance across the three self-talk conditions, a 3 (self-talk) x 2 (task type) x 2 (synchrony) ANCOVA was run, with only baseline performance as a covariate. Results revealed a significant main effect of baseline performance, $F(1, 333) = 329.00$, $p < .001$, $\eta_p^2 = .49$. Controlling for baseline performance, significant mean differences were found between self-talk conditions, $F(2, 333) = 4.18$, $p < .001$, $\eta_p^2 = .024$. Bonferroni follow-ups showed that participants in the individual-focused self-talk conditions reported significantly greater performance scores than those in the control conditions (p = .01). No significant differences emerged between group- and individual-focused self-talk conditions (p = .19) or group-focused self-talk and control conditions (p = .81). Mean plots for performance according to self-talk condition are presented in Figure 2. Thus, H1a was not supported.

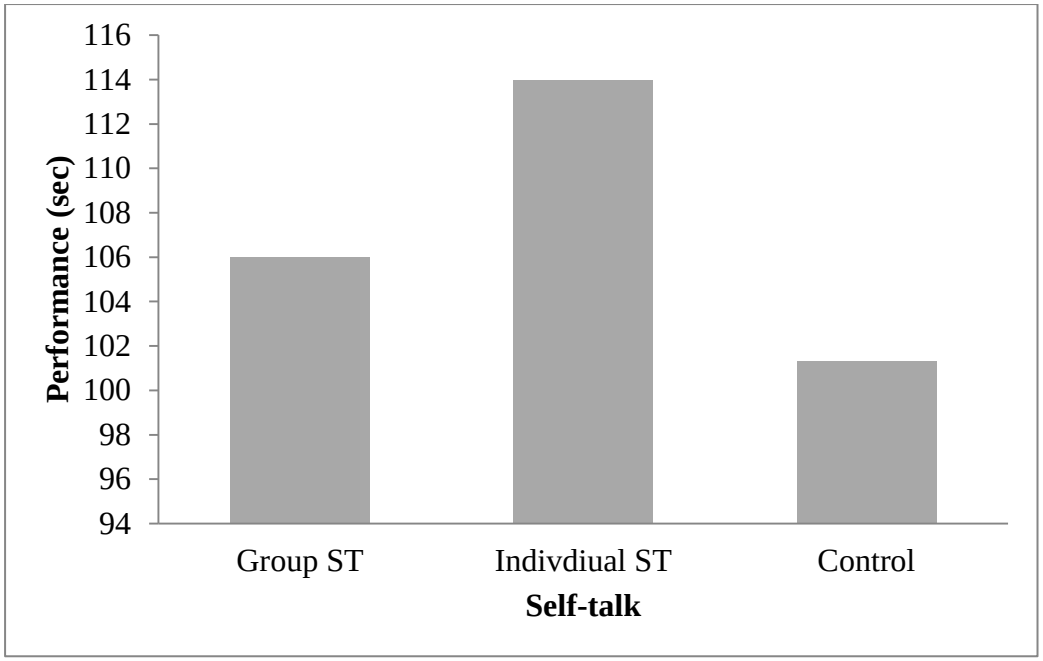

Figure 2. *Marginal means for performance across self-talk conditions*

To examine Hypothesis 1b, which stated that controlling for individualistic and collectivistic orientations, self-efficacy beliefs will be greater in a group-oriented self-talk condition than an individual-oriented condition, again, a series one-way between ANCOVAs were run, with baseline self-efficacy and the five factors of individualistic and collectivistic entered as a covariate. Prior to running analyses, preliminary tests revealed that the assumption of homogeneity in regression slopes was not violated for all of six covariates, thus, a series of one-way between ANCOVAs with and baseline performance and each of five factors of individualistic and collectivist orientations as a covariate, were run to test self-talk effects on self-efficacy beliefs. Results revealed no significant effects for the five covariate factors of individualistic and collectivistic orientations; (a) self-reliance, $F(1, 291) = .62$, $p = .43$, $\eta_p^2 = .002$, (b) competitiveness, $F(1, 299) = .09$, $p = .76$, $\eta_p^2 < .001$, (c) supremacy of individual interests, $F(1, 299) = .75$, $p = .39$, $\eta_p^2 = .002$, (d) supremacy of individual goals, $F(1, 296) = 1.59$,

p = .21, η_p^2 = .005, or (e) solitary work preference, $F(1, 297) = 3.25$, p = .10, η_p^2 = .007. Since the model fit (r^2 = .37) did not change without each of these covariates, again, all of the five factors of individualistic and collectivistic orientations were eliminated.

Thus, a 3 of 3 (self-talk) x 2 (task type) x 2 (synchrony) ANCOVA was run, with baseline self-efficacy as a covariate. Results revealed a significant relationship between baseline self-efficacy and the second block self-efficacy, $F(1, 292) = 158.89$, $p < .001$, η_p^2 = .35. Statistically controlling for baseline self-efficacy, a significant main effect for self-talk was found, $F(2, 292) = 3.29$, p = .04, η_p^2 = .022. Consistent with Hypothesis 1b, Bonferroni follow-ups indicated significantly higher self-efficacy ratings were reported in group-focused self-talk conditions than in the control conditions (p = .03). Self-efficacy ratings according to self-talk conditions were displayed in Figure 3.

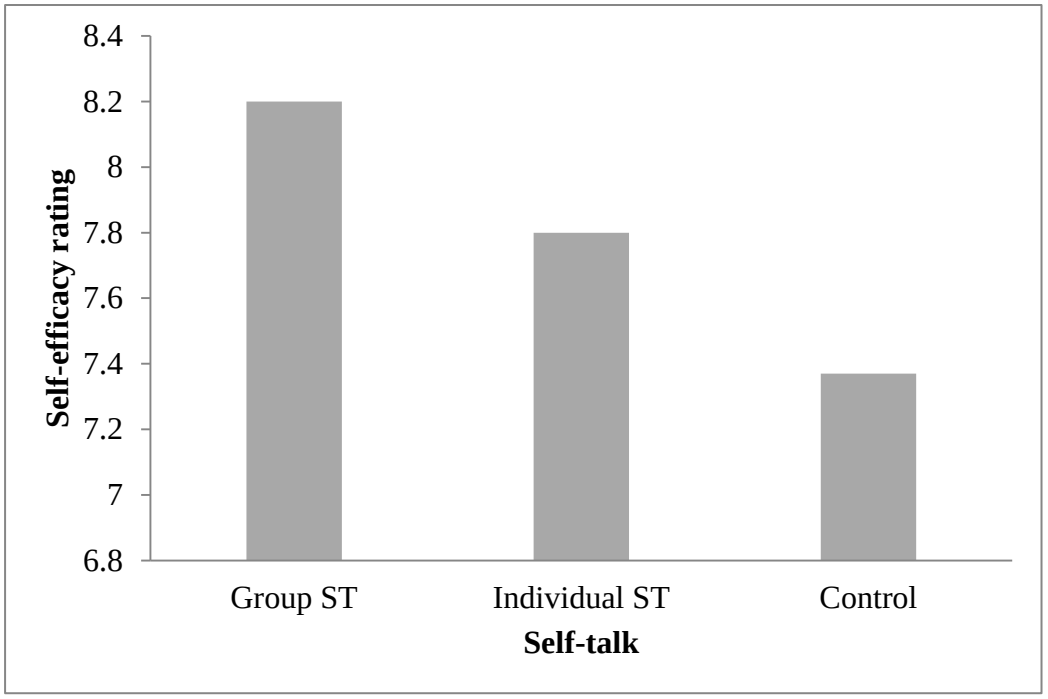

Figure 3. *Marginal means for self-efficacy across self-talk conditions*

To examine H1c stating that controlling for individualistic and collectivistic orientations, collective efficacy beliefs will be greater in a group-oriented self-talk condition than an individual-oriented condition, a series of one-way between ANCOVAs were run, with baseline collective efficacy and the five factors of individualistic and collectivistic entered as a covariate. Prior to running analyses, preliminary tests revealed that the assumption of homogeneity in regression slopes was not violated for all of six covariates, thus, a series of one-way between ANCOVAs with and baseline collective efficacy and each of five factors of individualistic and collectivist orientations as a covariate, were run to test self-talk effects on individuals' belief on their team's ability. Results revealed no significant effects for the five covariate factors of individualistic and collectivistic orientations; (a) self-reliance, $F(1, 288) = 1.51$, $p = .22$, $\eta_p^2 = .005$, (b) competitiveness, $F(1, 296) = .84$, $p = .77$, $\eta_p^2 < .001$, (c) supremacy of individual interests, $F(1, 296) = 1.59$, $p = .21$, $\eta_p^2 = .005$, (d) supremacy of individual goals, $F(1, 295) = .44$, $p = .51$, $\eta_p^2 = .001$, or (e) solitary work preference, $F(1, 294) = 3.25$, $p = .09$, $\eta_p^2 = .008$. Since the model fit ($r^2 = .37$) did not change without each of these covariates, again, all of the five factors of individualistic and collectivistic orientations were eliminated.

Thus, a 3 of 3 (self-talk) x 2 (task type) x 2 (synchrony) ANCOVA was run, with baseline collective efficacy as a covariate. Results revealed a significant relationship between baseline and the second block collective efficacy ratings, $F(1, 292) = 158.89$, $p < .001$, $\eta_p^2 = .35$. Statistically controlling for baseline collective efficacy, analyses showed that there were no significant mean differences across the three self-talk conditions, $F(2, 292) = 1.06$, $p = .35$, $\eta_p^2 = .007$. Results failed to provide enough evidence to support H1c.

Furthermore, a series of 3 of 3 (self-talk) x 2 (task type) x 2 (synchrony) ANOVAs were run for individuals' mean sense of unity ratings. Results revealed no significant mean difference in sense of unity across the three self-talk conditions, $F(2, 334) = 1.79$, $p = .17$, $\eta_p^2 = .011$.

Task Type Hypotheses. H2a stated that participants in the additive condition will perform better compared to those in the coactive condition. To examine H2a, a 3 (self-talk) x 2 (task type) x 2 (synchrony) ANCOVA was run, with baseline performance as a covariate. Controlling for baseline performance, again, there were significant mean differences in performance between additive and coactive conditions, $F(1, 333) = 5.49$, $p = .02$, $\eta_p^2 = .016$. That is, participants in the additive task condition reported greater performance compared to those in the coactive task condition (see Figure 4). Therefore, H2a was fully supported.

Regarding Hypothesis 2b stating that additive task will produce greater self-efficacy compared to the coactive task, the same 3 (self-talk) x 2 (task type) x 2 (synchrony) ANCOVA was run, with baseline self-efficacy as a covariate. Results revealed that individuals in additive task condition reported higher levels of self-efficacy than they did in the coactive task condition, however, this effect was not statistically significant, $F(1, 292) = 3.53$, $p = .06$, $\eta_p^2 = .004$. Thus, there was insufficient evidence to support H2b.

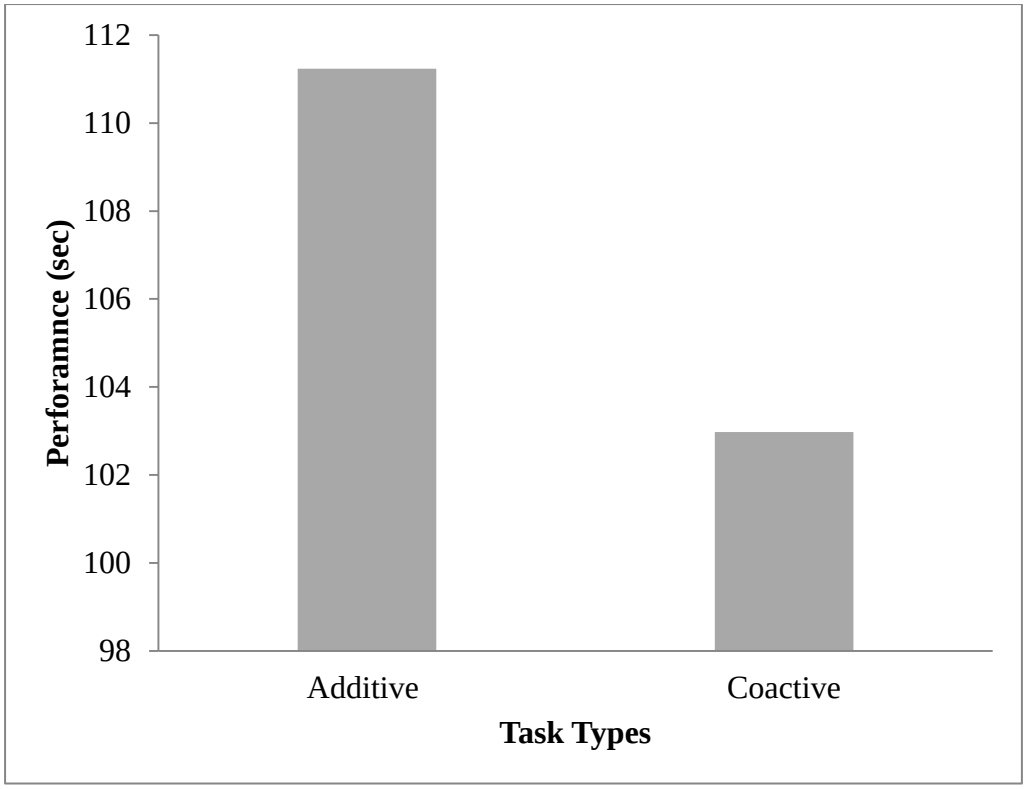

Figure 4. *Marginal means for performance by task type conditions*

To examine Hypothesis 2c stating that participant in the additive task condition will perceive greater sense of collective efficacy compared to those in the coactive task condition, the same 3 (self-talk) x 2 (task type) x 2 (synchrony) ANCOVA was run, with baseline collective efficacy as a covariate. The result provided support for H2c, $F(1, 292) = 6.55$, $p = .01$, $\eta_p^2 = .022$, when baseline collective efficacy was controlled (see Figure 5).

Lastly, regarding sense of unity, no significant main effects were found, $F(1, 334) = .29$, $p = .58$, $\eta_p^2 = .001$.

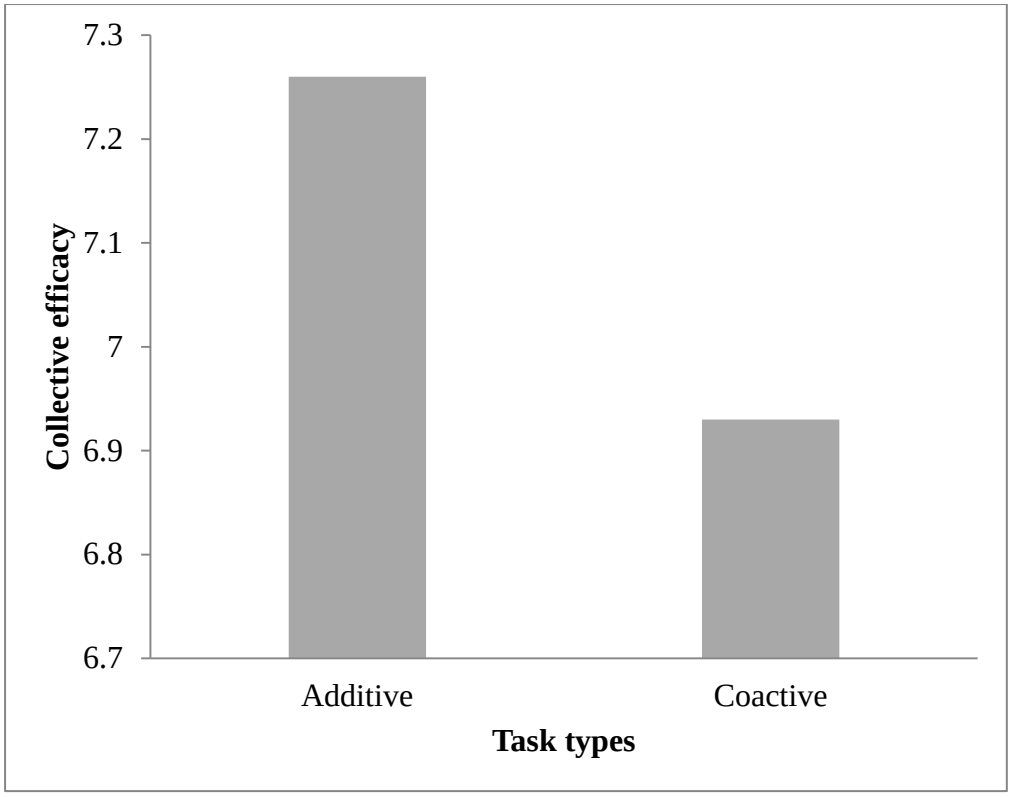

Figure 5. *Marginal means for collective efficacy by task type conditions*

Synchrony Hypotheses. A 3 (self-talk) x 2 (task type) x 2 (synchrony) ANCOVA was run, with baseline performance as a covariate, to examine H3a stating that synchronous activity will produce greater performance improvement than will asynchronous activity. A significant main effect for synchrony in performance improvement was found, $F(1, 333) = 4.07$, $p = .04$, $\eta_p^2 = .012$. That is, individuals doing the synchronous activity held the plank exercise longer than those doing asynchronous activity (see Figure 6). Therefore, H3a was fully supported.

H3b stated that participants in the synchrony condition will perceived stronger sense of collective efficacy compared to those in the asynchrony condition. However, the analyses showed no main effect for synchrony, $F(1, 292) = 1.28$, $p = .26$, $\eta_p^2 = .004$, as a result, H3b was rejected.

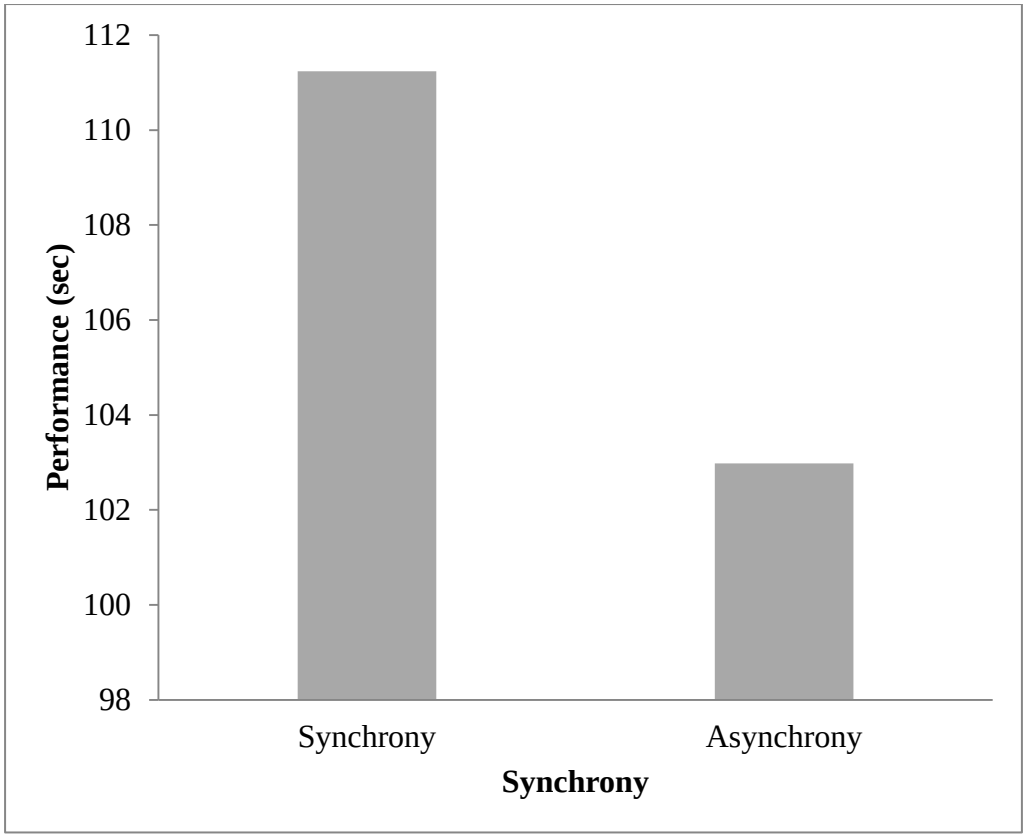

Figure 6. *Marginal means for performance by synchrony conditions*

Finally, a series of 3 of 3 (self-talk) x 2 (task type) x 2 (synchrony) ANOVAs were run for individuals' mean sense of unity ratings, revealing no significant synchrony effects $F(1, 334) = 2.01$, $p = .16$, $\eta_p^2 = .006$.

Interaction Effects. When baseline performance scores were controlled, no interactions in the second block performance score were found between self-talk and task type conditions, $F(2, 333) = .71$, $p = .49$, $\eta_p^2 = .004$, between self-talk and synchrony conditions, $F(2, 333) = .73$, $p = .48$, $\eta_p^2 = .004$, or between synchrony and task type conditions, $F(1, 333) = .19$, $p = .89$, $\eta_p^2 < .001$.

Consistent with the analysis for performance, no significant effects of self-talk x task type conditions on the second block self-efficacy, $F(2, 292) = 1.71$, $p = .18$, $\eta_p^2 = .012$, self-talk x

synchrony, $F(2, 292) = 1.03$, $p = .36$, $\eta_p^2 = .007$, and between synchrony and task type conditions, $F(1, 292) = .05$, $p = .83$, $\eta_p^2 < .001$.

Regarding collective efficacy, no significant effects for self-talk x task type conditions, $F(2, 292) = 1.07$, $p = .35$, $\eta_p^2 = .007$, self-talk x synchrony, $F(2, 292) = 1.45$, $p = .24$, $\eta_p^2 = .01$, or synchrony x task type conditions, $F(1, 292) = .01$, $p = .92$, $\eta_p^2 < .001$. With respect to the interaction effect between task types and synchrony, again, not enough evidence was found to support the hypothesis.

In terms of sense of unity, there were no significant interaction effects for self-talk x task types, $F(2, 334) = .10$, $p = .94$, $\eta_p^2 = .001$, self-talk x synchrony, $F(2, 334) = .71$, $p = .49$, $\eta_p^2 = .004$, synchrony x task types, $F(1, 334) = .41$, $p = .52$, $\eta_p^2 = .001$.

Exploratory Analyses

Several exploratory analyses were conducted to help interpret results found in the analyses from the main hypotheses. First, based on the finding from the self-talk manipulation checks, showing 78% of participants in the motivational self-talk conditions reported that they used the given self-talk statements while performing the plank exercise, only those ($n = 76$ in the group-focused self-talk conditions and, $n = 80$ in the individual self-talk conditions) who correctly used the self-talk intervention were selected for the follow-up analysis. Participants in the control conditions ($n = 110$) were also excluded.

Selected Motivational Self-talk Groups. To test self-talk effects on performance, a 2 (self-talk) x 2 (task type) x 2 (synchrony) ANCOVA was run, with baseline performance as a covariate revealing a significant effect of the baseline performance, $F(1, 147) = 242.90$, $p < .001$,

η_p^2 = .62. A significant mean difference in the second block performance between the group- and the individual-focused self-talk conditions was found, $F(1, 147) = 4.89$, $p = .03$, $\eta_p^2 = .032$. That is, when the baseline performance was controlled, participants in the individual-focused self-talk conditions ($M = 112.72$, $SD = 3.11$) reported greater performance in the second block than did those in the group-focused self-talk conditions ($M = 103.03$, $SD = 3.03$) as displayed in figure 7.

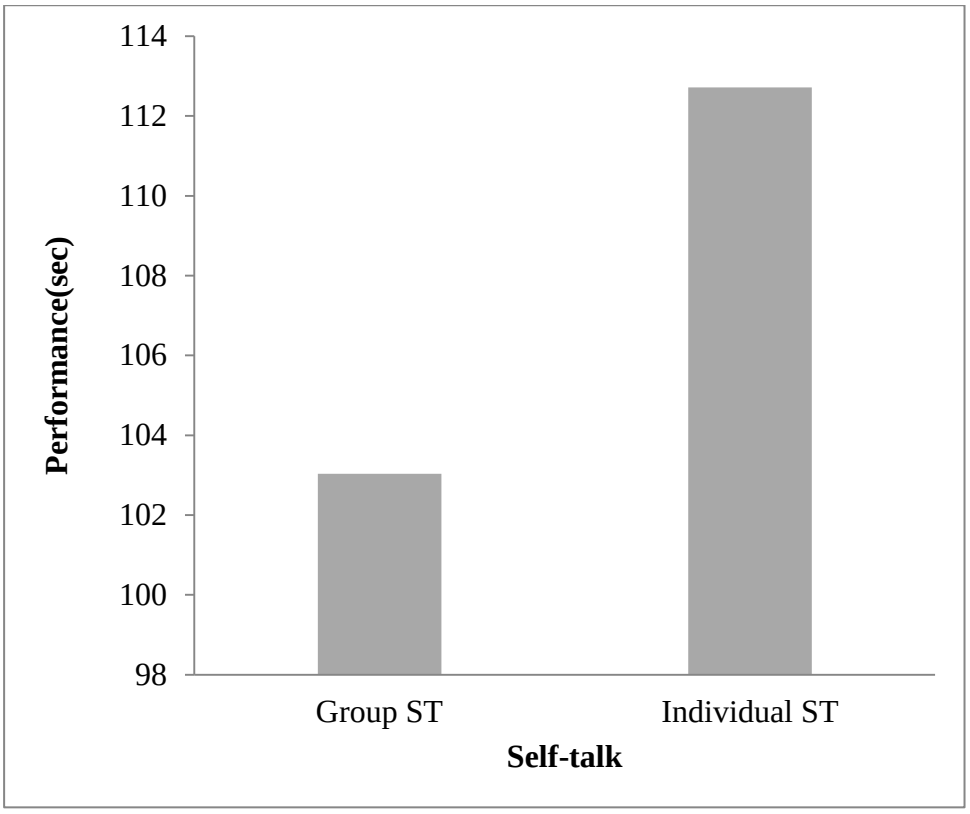

Figure 7. *Marginal means for performance across the two selected motivational self-talk conditions*

Results also revealed significant main effects for task type, $F(1, 147) = 11.43$, $p = .001$, $\eta_p^2 = .07$. When statistically controlling for the baseline performance, participants in additive conditions ($M = 113.89$, $SD = 2.82$) performed greater in the second block compared to those in

coactive conditions (M = 99.35, SD = 3.45) as displayed in Figure 8. A main effect for synchrony failed to reach the statistically significant level, $F(1, 147) = 3.7$, $p = .06$, $\eta_p^2 = .021$.

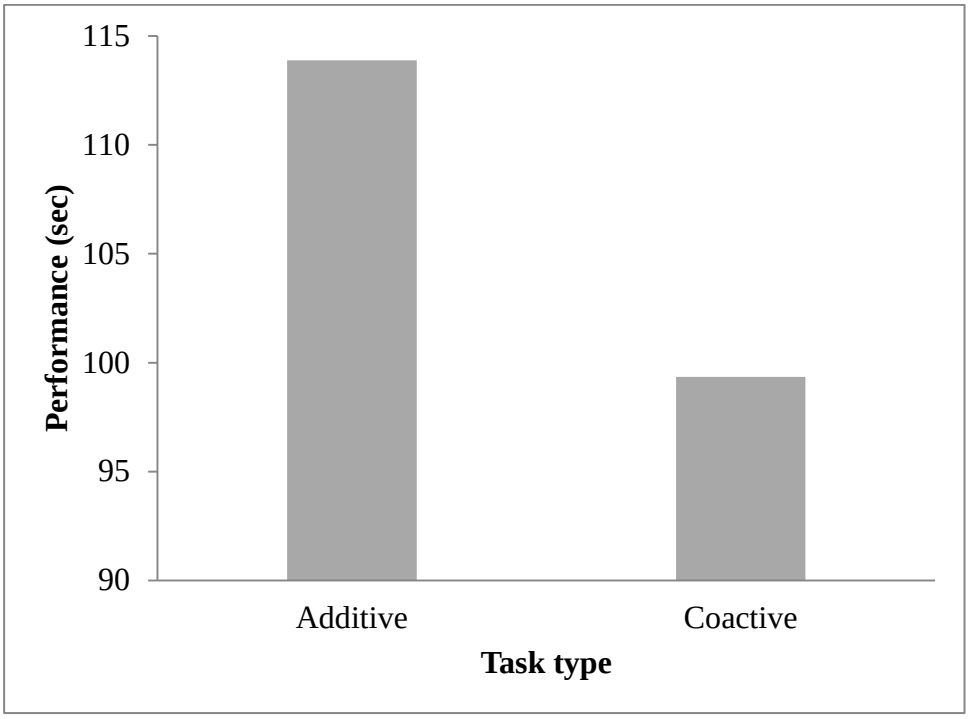

Figure 8. *Marginal means for performance for task type among selected motivational self-talk conditions*

Sense of Unity. Sense of unity was measured by 3 items; (a) the feeling that participants were on the same team with their partner, (b) perception about their partner as a team member, and (c) enjoyment in working together. Although no main effects were found in the analyses for the main hypotheses, additional analyses were conducted using each item. A series of 3 (self-talk) x 2 (task type) x 2 (synchrony) ANOVAs were run. Regarding the feeling that participants were on the same team with their partner, no main effects were found for self-talk conditions , $F(2, 334) = 1.74$, $p = .18$, $\eta_p^2 = .010$, and no mean difference found in perception about their partner as a team member across self-talk conditions, $F(2, 334) = .15$, $p = .86$. However, significant mean differences in enjoyment in working as a group were found across the three self-talk

conditions, $F(2, 334) = 3.68$, $p = .03$, $\eta_p^2 = .022$. Bonferroni follow-ups showed that enjoyment in working together with their partner in the individual-focused self-talk condition ($M = 5.44$, $SD = 1.34$) was not significantly different in either the group-focused self-talk condition ($p = .74$, $M = 5.88$, $SD = 1.23$) or the control condition ($p = .62$, $M = 5.37$, $SD = 1.65$). However, consistent with the findings for self-efficacy measures, participants using group-focused self-talk exhibited significantly greater enjoyment in working with their partner than the control condition ($p = .009$), as displayed in Figure 9.

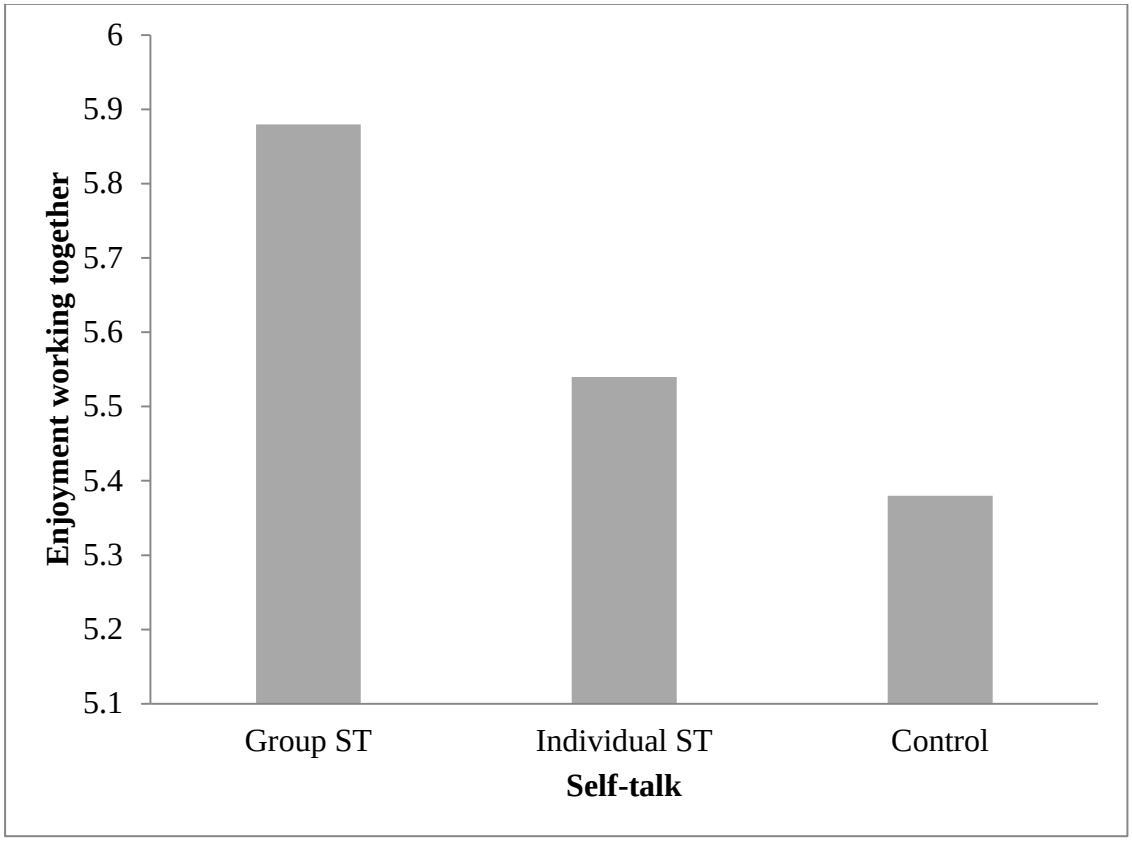

Figure 9. *Means for enjoyment in working together by self-talk conditions*

In terms of task types, no mean difference was found in the feeling that participants were on the same team with their partner, $F(1, 334) = 2.46$, $p = .12$, $\eta_p^2 = .007$; in individuals'

perception about their partner as a teammate, , $F(1, 334) = .08$, $p = .78$, $\eta_p^2 = .0001$; or enjoyment in working together, $F(1, 334) = .001$, $p = .99$, $\eta_p^2 = .0001$.

Finally, a 3 (self-talk) x 2 (task type) x 2 (synchrony) ANOVA was run regarding the feeling that participants were on the same team with their partner. Significant mean differences were found between synchrony and asynchrony conditions, $F(1, 334) = 4.94$, $p = .03$, $\eta_p^2 = .007$. That is, participants in the synchrony condition ($M = 5.20$, $SD = 1.73$) reported a higher degree of feeling that they were on the same team with their partner, compared to those in the asynchrony condition ($M = 4.80$, $SD = 1.77$). Figure 10 displayed these mean differences in feeling of unity scores. However, no main effects for synchrony were found in individuals' perception about their partner as a team member, $F(1, 334) = .40$, $p = .53$, $\eta_p^2 = .001$, or enjoyment in working together, , $F(1, 334) = .54$, $p = .46$, $\eta_p^2 = .002$.

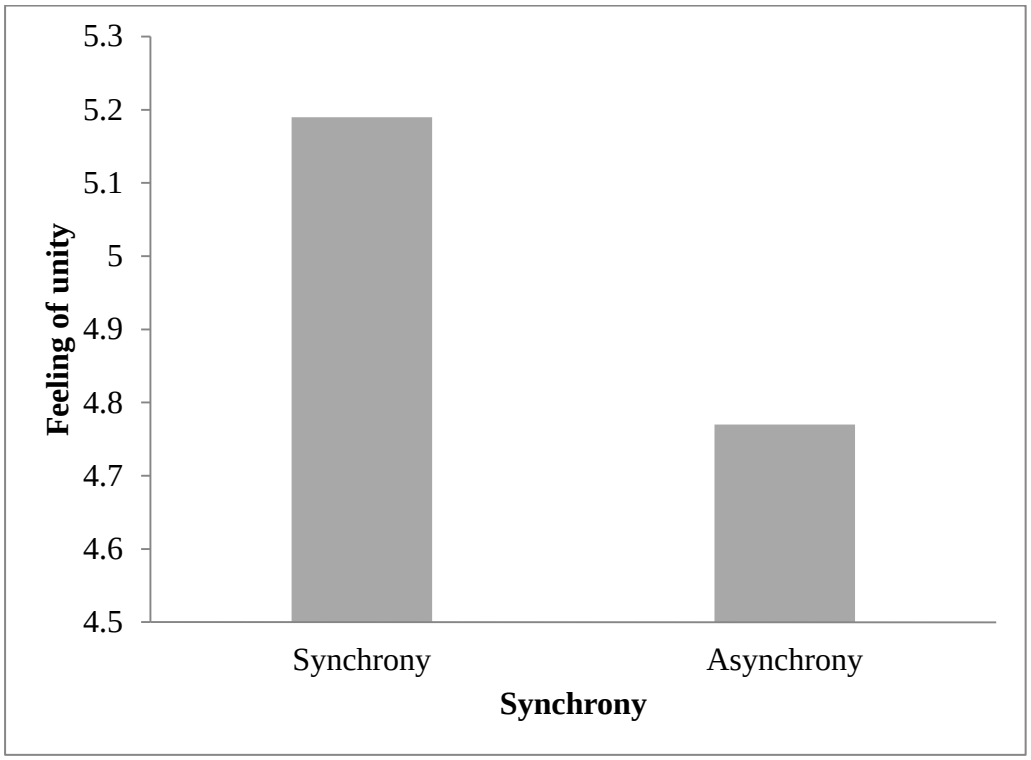

Figure 10. *Means for feeling of unity between synchrony conditions*

Summary

Thus, the hypothesis for self-talk effects that was partially supported was Hypothesis 1b that self-efficacy beliefs will be greater in a group-oriented self-talk condition than an individual-oriented condition. For task type, Hypothesis 2a that participants in the additive condition will produce greater performance improvement compared to those in the coactive condition; and Hypothesis 2c, that individuals in additive task condition will report higher level of collective efficacy than those in the coactive task condition was supported. Lastly, regarding synchrony effects, Hypothesis 3a that the synchronous activity will produce greater performance improvement compared to the asynchronous condition; and Hypothesis 3c, that the synchronous activity will produce stronger sense of unity compared to the asynchronous activity was supported.

CHAPTER 5

DISCUSSION

Previous researchers have observed self-talk effects under a variety of experimental tasks and individual settings. What is not yet clear are (a) whether self-talk strategies might be effective in a dyadic exercise setting, (b) how modifying the referent of self-talk statements with respect to level of agency (i.e., individual versus group) might be influential, (c) under what conditions (i.e., task types) the self-talk effects might be observed in a group context, and (d) the way in which one's individualist or collectivist orientation may modify the effects of "we" versus "I" self-talk. In addition to self-talk, although recent studies have provided evidence for the effectiveness of synchrony on positive relative outcomes (i.e., sense of unity, relationship quality, enjoyment in working together; Vacharkulksemsuk & Fredrickson, 2011; Wiltermuth & Heath, 2009), there is relatively little evidence on the synchronous activity effects in a group exercise setting. Therefore, the purpose of this study was to explore the effects of 'individual-focused' versus 'group-focused' self-talk and synchrony on performance, self-efficacy, collective efficacy, and sense of unity between additive and coactive task conditions. Additionally, this study also sought to identify whether individualist and collectivist orientations may influence the way in which self-talk strategies enhance performance and one's beliefs about one's own and one's team's capabilities. This chapter discusses the findings of the current study, identifies limitations, and outlines practical implications of these findings and future research directions.

A consistent finding across previous studies examining self-talk effects has been that motivational self-talk statements enhance performance and self-efficacy beliefs in various individual contexts (Hardy, 2006; Hatzigeorigiadis et al., 2008; 2009; Theodorakis,

Hatzigeorgiadis, & Zourbanos, 2012). Most recently, Son et al. (2011) found that "we"-referent motivational self-talk statements led to greater performance improvement and higher self- and collective efficacy in a team dart-throwing performance compared to "I"-referent self-talk and neutral self-talk conditions. Furthermore, researchers (e.g., Bandura, 1997; Earley, 1999; Gibson, 1999) suggested that individuals' individualistic and collectivistic orientations can be influential on shaping his or her efficacy beliefs. Thus, in the current study, controlling for individualistic and collectivistic orientations, "we" self-talk was predicted to produce greater performance improvement (H1a), stronger sense of self-efficacy (H1b), collective efficacy (H1c), and sense of unity (H1d) than would 'I" self-talk. Individuals in the additive condition were hypothesized to report greater performance improvement (H2a), stronger sense of self-efficacy (H2b), collective efficacy (H2c), and sense of unity (H2d) than those in the coactive condition. Regarding synchrony, it was hypothesized that compared to asynchronous activity, synchronous activity was expected to be more effective to enhance performance (H3a), collective efficacy (H3b), and sense of unity (H4c). In addition to main effects for self-talk, task type, and synchrony, this study examined interaction effects between self-talk and task type, between self-talk and synchrony, and between task type and synchrony. However, no direct predictions were made because of lack of evidence in previous literature.

Hypothesis 1

At first blush, contrary to what was expected in H1a, "we"-self-talk did not lead to greater performance improvement compared to either "I"-self-talk or control conditions, however, individuals implementing "I"-self-talk reported greater performance improvement than those in the control group. Furthermore, additional analyses using only participants who reported to correctly use self-talk intervention revealed that greater performance improvement in the

individual-self-talk groups compared to in the group self-talk groups. This contradicts the previous study (Son et al., 2011) using the team dart-throwing task. There were three differences between the dart-throwing study and the current one: team size, task characteristics, and task performance. Given that larger sizes of teams were used in the previous research (3-4 person teams; Son et al., 2011 and 4-5 person teams; Brown, 2003), the "I"-self-talk effect in this study may be explained by the smaller size of group used in this study (i.e., a dyad). Results suggest that different references used to frame one's self-talk (i.e., "we" versus "I") were responsible for differences in individual performance improvement in team settings. Thus, it is worth highlighting that individuals performing within dyads may be more sensitive to psychological strategies that emphasize the individual's own capability. Further investigation on this issue is encouraged that examines the differing effects of individual- and team-focused interventions, across different sizes of group.

In terms of task characteristics, the dart throw is an aiming task that relies on skill and focus; whereas, the plank task is a persistence task that involves very little skill but a great deal of effort. Self-talk literature has found that motivational statements were more effective in yielding better performance and greater motivation in persistent tasks such as the one used in this study compared to a task required concentration and accuracy such as a dart-throwing task (Hardy, 2006; Theodorakis et al., 2012). Combining and the motivational nature of statements and convincing oneself that "I" can do this may have been more salient in an effort-based task than in an aiming task.

Additionally, the dart-throw task was performed sequentially. Each person took his or her turn at the task while other team members watched. Son et al. (2011) suggested that watching team members' performance and handing the darts thrown by the person to the next performer

would help build sense of being in the same team. In the current study, however, participants performed simultaneously. Perhaps in simultaneous performances, there is more focus on oneself and lack of environment emphasizing the concept of being in a group than on the collective.

Lastly, given that additive tasks were still considered as comparatively low interdependent tasks (Burke et al., 2006; Katz-Navon & Erez, 2005), it is possible that the concept of being in the same team may not be activated, which is why "we" self-talk may not have increased performance. On the other hand, I-talk may have made personal self and self-standards salient, and may have worked to increase motivation and performance.

As expected in H1b, individuals reported higher levels of self-efficacy in the group-focused self-talk conditions compared to the control conditions. Although these findings require verification via further investigation, it is possible that the results may be partly due to the group-focused nature of performance. Son et al. (2011) suggested that the team-based context surrounding the activity exaggerated the salience (and therefore the impact) of the group-referenced statements. In a team performance context, such as the one used in this study, it is entirely possible that positive statements emphasizing the group's capabilities "rang true," were noticed, and fostered a sense of unity and purpose among the participants. Indeed, the finding from this investigation also revealed that individuals in the group-focused self-talk condition reported higher enjoyment in working with their partner than the other two conditions. Positive emotional state (i.e., enjoyment), of course, is typically viewed as one of sources enhancing efficacy beliefs (Bandura, 1997). Thus, by contributing to enhanced enjoyment in working as a group between team members, group-referenced self-talk may have provided an indirect buffer to foster self-efficacy with the testing protocol.

Hypotheses 2

In accordance with our expectation, individuals in the additive condition reported greater performance improvement than those in the coactive condition. Interestingly, one of the most recent studies using the similar experimental setting (Feltz et al., 2011), but having a virtual partner instead of a real partner, found no mean performance differences between additive and coactive conditions. In Feltz et al.'s (2011) study, participants were asked to perform the two blocks of a series of abdominal plank exercises. Like the one used in this study, the first block was completed individually and the second block was performed with the virtual partner. The authors suggested that performance improvements did not seem to depend on task interdependence, but simply that participants were aware that they are being outperformed by a peer exercising in the same task at the same time. However, in the case of having a real partner, task characteristics may potentially moderate exercisers' motivation.

Although no self-talk or synchrony effects were found for collective efficacy, findings of this study provided support for the effect of task type on shaping collective efficacy. According to Johnston (1967), in team pursuits, a team member is more likely to assess the performance accomplishments of the group as a whole, rather than one's own contributions to the team's performance. Indeed, it has been supported that in group contexts, a team member's beliefs in his/her team's capability to achieve a certain level of performance would be strongly linked to the interdependence of task. Accordingly, collective efficacy expectations are more likely to be salient in a task requiring teamwork or team environment (Gibson, 2001; Burke et al., 2006; Katz-Navon & Erez, 2005).

Goncalo, Polman, and Maslach (2010) examined the relationship between collective efficacy and group performance across a 15-week semester. They found that initial collective

efficacy beliefs on the first or third week did not significantly predict group performance. However, as the semester passed, the relationship between collective efficacy and performance was getting stronger. The author suggested that for newly formed teams, collective efficacy would not be fully built at the beginning of team generation and the task types may moderate the period of building collective efficacy among group members. Knowing that (a) artificially formed groups were used in this study and (b) there was a short period of self-talk and synchrony intervention, it is plausible to say that the sense of collective efficacy may not be clearly built. Additionally, there was no basis on which to form a baseline judgment of collective efficacy in this task without knowing one's partner's capability. Thus, effects of different types of self-talk and synchrony on collective efficacy may be examined in longitudinal design in the future.

With regard to task types, researchers have found consistent support for task interdependence as a moderator for the relationship between efficacy beliefs and performance and furthermore, the nature of both tasks used in this study (i.e., additive and coactive tasks) were still considered as comparatively low interdependent tasks (Burke et al., 2006; Katz-Navon & Erez, 2005). Furthermore, it is possible to say that additive tasks would not foster developing sense of 'groupness". Although in coactive task conditions, no emphasis on being on the same team was made, participants in coactive conditions may unconsciously feel somewhat like group because measures and instructions refer to their partner/teammate. As a result, it would be particularly interesting in future studies to explore the ways in which high interdependent tasks such as a conjunctive task or sporting teams (e.g., football, soccer, or volleyball) moderate the influence of self-talk modalities upon efficacy perceptions.

Hypothesis 3.

Consistent with H3a, results showed that a brief synchronous activity produced greater performance improvement compared to asynchronous activity. An increasing body of recent studies have explored the synchrony effects on relative team outcomes, for example, compassion (Valdesolo & DeSteno, 2011), cooperation and a sense of unity (Wiltermuth & Heath, 2009), affiliation (Hove & Risen, 2009), affective states (Haidt, Seder, & Kesebir, 2008), satisfaction (Jones & Wirtz, 2007), relationship quality (Vacharkulksemsuk & Fredrickson, 2011), and even elevated pain thresholds (Cohen, Ejsmond-Frey, Knight, & Dunbar, 2010). However, relatively little attention has been directed toward examining the effectiveness of synchrony in enhancing performance in group exercise contexts. Bearing this in mind, the present findings not only provide preliminary empirical evidence for the relationship between synchrony and performance but also raise a number of important questions for future research on this topic, for example, (a) the relationship between team characteristics (e.g., team size or difference contexts such as sporting settings) and (b) types of synchrony (i.e., muscular bonding, music, or dancing).

Additionally, considering the fact that synchrony induction was very brief (less than 30 seconds) and produced performance improvement on a strenuous persistence task up to approximately 10 minutes later, highlights the strength of a simple synchrony treatment to improve effort-based performance. A longer and stronger synchrony intervention on team performance and positive team related outcomes such as collective efficacy, sense of unity, and team cooperation/team work may have even larger effects. Thus, further investigation on when and how long the synchrony intervention is implemented should be guaranteed.

Consistent with the findings from the previous research (e.g., Lakens, 2010), the current study found that a synchronous activity produced a stronger feeling of being on the same team

with their partner than did an asynchronous activity. Hamilton et al. (2005) suggested that enhanced sense of unity within a group can help foster cooperation to attain the shared goals and consequently improve group performance. Thus, it is possible that strong sense of unity built by the synchronous activity can contribute to performance improvement.

Previous research found that participants in the synchronous condition (a) felt more connected with their partner, (b) trusted their partner more, (c) reported greater feelings of being on the same team, and (d) reported greater satisfaction than did those in the asynchronous condition (Jones & Wirtz, 2007; Wiltermuth & Heath, 2009). Consistent with the findings from the previous research, the current study found that a synchronous activity produced a stronger feeling of being on the same team with their partner than did an asynchronous activity. In addition to the synchrony effect, individuals in group-focused self-talk also reported higher level of enjoyment working with their partner compared to the control condition. In light of these interesting findings, this study provided preliminary support for the effectiveness of synchrony and group-focused self-talk intervention as team-building strategies in interdepend exercise contexts.

Interaction Effects

Contrary to the findings from previous research (Brown, 2003; Early, 1999; Wiltermuth & Heath, 2009), no significant interaction effects were found between self-talk and synchrony, between self-talk and task types, or between synchrony and task types. It is suggested that in a dyadic exercise setting, there are no functional advantages of combining self-talk intervention and synchronous effects in either additive or coactive conditions in increasing one's exercise performance, efficacy beliefs, and a sense of unity.

Individualistic and Collectivistic Orientations as Covariates

With respect to individualistic and collectivistic orientations, the results of this study did not support the hypothesis that individual differences on this construct would influence the impact of self-talk upon performance, self-efficacy and collective efficacy beliefs. Prior studies in business and organizational domains have found evidence that the extent to which individuals view themselves as either 'individualistic' or 'collectivistic' may influence self-efficacy or collective efficacy perceptions (e.g., Eden & Aviram, 1993; Goddard & Goddard, 2001; Latham & Budworth, 2006; Oettingen, 1995). However, the present data revealed neither a main effect for individualism-collectivism nor an interaction effect with self-talk, the possible reasons for which are discussed in the section on 'limitations' within this chapter. Bandura contended that, "individualism-collectivism orientations must be treated as multifaceted dynamic influences in explorations of how efficacy beliefs regulate human functioning within independent and interdependent social systems" (1997, p. 32). Bearing this in mind, future study is warranted that uses multidimensional approaches (i.e., individual versus cultural levels) to assess individualist or collectivistic orientations in order to expand our knowledge about the possible relationship between the individualism-collectivism construct and efficacy beliefs.

Implications and Suggestions for Future Research

In light of the possible effectiveness and convenience with which these techniques may be implemented, the findings of the present study hold a number of implications for a small group exercise and sporting activities. First, given that in this study self-talk interventions were shown to be beneficial with newly-formed dyads, the present findings suggest that when a coach or instructor is working with inexperienced individuals, assigning them into a pair and adopting self-talk statements at either the group- or individual-level may promote positive efficacy

perceptions, enhanced enjoyment in working together, and enhanced performance. Indeed, by bringing about performance attainments through the self-talk intervention in the early stages of team development, it may be possible to indirectly enhance future efficacy perceptions and consequently enhance exercise adherence.

Second, according to Gammage et al. (2001), roughly 98% of exercisers used self-talk strategies. Nevertheless, there has been relatively little empirical evidence for the relationship between self-talk and performance within exercise settings, particularly group contexts. Given the team-based experimental design of this investigation, the present results would provide preliminary evidence for group exercise class instructors or trainers that actively employing motivational self-talk strategies (either "we"-talk or "I"-talk) may yield better performance, stronger self-efficacy, and greater enjoyment in exercising together. However, given that the use and type of self-talk strategies may vary depending on type of exercise (i.e., burnout boot camp versus yoga), group size, or skill level, further investigation is clearly warranted regarding the characteristics of those individuals who will benefit from specific types of self-talk.

Third, this study provides support for the utility of *self-recorded* methods of self-talk (Hamilton, Scott, & MacDougall, 2007; Son et al., 2011), and as such, this type of assisted intervention may represent a relatively simple aid to team members when developing and implementing their own self-talk routines. For individuals with little or no experience of self-talk training, this type of facilitated method may be particularly helpful.

In addition to self-talk strategies, this study provides preliminary support for the effectiveness of synchrony on performance in interdepend sport and exercise contexts. More recently, research from various contexts, such as business and education settings, has shown the effectiveness of synchrony on enhanced sense of unity, cooperation, positive emotional states

and suggested that synchrony may enable groups to mitigate the free-ride problem and more successfully produce a shared group outcome (Haidt et al., 2008; Hove & Risen, 2009; Jones & Wirtz, 2007; Wiltermuth & Heath, 2009). Given that synchronous activities are very simple and easy to be administered; further investigation is clearly warranted regarding the effectiveness of synchrony strategies as a team-building strategy across different characteristics of sport teams and exercising groups.

Fifth, given that in this study an additive task type was more responsible for performance improvement than a coactive task type, a coach, a trainer, or an instructor, working with a group of individuals, should assign them into a pair, which is susceptible to loafing through an additive task setting, to help them exercise longer. Indeed, Gibson (2001) found that when group-level goals were set, individuals outperformed and perceived higher level of efficacy beliefs in a small group setting compared to when individual-focused goals were set. It is interesting to further investigate whether task characteristics (i.e., level of interdependences) and different levels of goal-setting training (individual- or group-level) may be beneficial to enhance performance and exercise adherence.

Limitations

Although the present study makes a number of important theoretical and practical contributions, there are shortcomings that need to be considered when evaluating the current findings. First, and perhaps foremost, the teams used in this study were artificially formed by the researcher as part of the experiment, and as a result team members were largely unfamiliar with one another in this study. Additionally, since there was no basis on which to form a baseline judgment of collective efficacy in this task without knowing one's partner's capability. Drawing from this, the extent to which the current findings generalize to more experienced teams is likely

limited. Therefore, a logical follow-up to this study would be to examine the impact of group-oriented and individual-oriented self-talk using teams varying in experience and drawn from real group-exercising classes or exercising buddies. Furthermore, in this study, dyads were used, and thus, the extent to which the results generalize to the larger size of groups (i.e., 3 or more person teams) is limited.

Second, in relation to performance, there are a few minor limitations which would be important to consider in the future studies of this nature. Unlike the first block, participants performed simultaneously in the second block with their team member and as a result, this finding may be limited to generalize to a task sequentially performed. Due to the presence of their partner who was relatively unfamiliar, competitiveness may partly influence their performance attainment.

Third, with respect to assessing a sense of unity, the third item regarding enjoyment in working with their partner was measured prior to performing together in the second block. The baseline collective efficacy was measured with no information on partner's ability. This could have created confusion among participants and possibly result in the threat to the validity and reliability of measure and increased error variance.

Lastly, a final potential limitation of the present investigation involves the rationalization of individualism/collectivism (i.e. the I/C scale). The data supported the reliability and validity of the I/C Scale and the validity of the I/C scale as the measurement of individualism-collectivism has been supported in several cultures such as America, Ireland, and, India (Ramamoorthy & Carroll, 1998; Romamoorthy et al., 2005; Wagner, 1995). However, Triandis (1995) suggested that the level of individualism-collectivism was highly specific to the reference-group used in the instrument. Indeed, as noted by Bandura (2002), "people vary in individualistic and collectivistic

social orientations depending on whether the reference group is familial, peer, academic, or national" (p. 275). Thus, given that the I/C was not specifically developed with interdependent sport and exercise settings as the frame of reference, it is likely that a sport-specific measure of this orientation (which has yet to be developed) would have greater capacity for identifying individualists and collectivists in sport performance domains.

Additionally, research (e.g., Alavi & McCormic, 2004; Earley, 1994; Gibson, 1999) using individualism-collectivism has found its effects when tasks were conjunctive or highly interdependent (e.g., team projects which required cooperation and distinguished individual's roles within a group, and team outcomes). Knowing only coactive and additive tasks were used in this study, further investigation is warranted in conjunctive tasks or real sporting tasks.

Conclusion

The results obtained in the present investigation suggest that individual-focused self-talk is better than group-focused self-talk for persistence tasks that are performed simultaneously with partner. However, group-focused self-talk and synchrony activities are effective strategies in enhancing self-efficacy and sense of unity in a dyadic exercising context. Notwithstanding the limitations outlined above, the findings of this study provide empirical evidence that may be of particular relevance to practitioners and coaches as they seek to reinforce efficacy perceptions and enhance performance within interdependent sport and exercise settings. With respect to the paucity of research implementing self-talk interventions and synchrony as an efficacy-enhancing technique in a group setting, these findings offer an innovative direction for future investigations aimed at developing individuals' efficacy perceptions and sense of unity, and consequently, improving their performance.

APPENDICES

Appendix A
The I/C Scale

In this questionnaire, we want to know how strongly you agree or disagree with some statements. There are no right or wrong answers. If you agree, circle one of the higher numbers; if you disagree, circle one of the smaller numbers. You can use any number on the scale depending on how strongly you feel.

		Strongly Disagree						**Strongly Agree**
1	It annoys me when others perform better than I do……..……..……..……..……...	1	2	3	4	5	6	7
2	I prefer to work with others than to work alone……..……	1	2	3	4	5	6	7
3	Only those who depend on themselves get ahead in life…….	1	2	3	4	5	6	7
4	Group is more productive when members follow their own interests and concerns…..……..……..……..……	1	2	3	4	5	6	7
5	In the long run the only person you can count on is yourself……..	1	2	3	4	5	6	7
6	Working with a group is better than working alone..……	1	2	3	4	5	6	7
7	To be superior a person must stand alone…...…..…….	1	2	3	4	5	6	7
8	It is important to win ……..……..……	1	2	3	4	5	6	7
9	A group is more efficient when members do what they think is best rather than what the group wants them to do ..	1	2	3	4	5	6	7
10	People should be made aware that if they are going to be part of a group then they are sometimes going to have to do things they don't want to do……..	1	2	3	4	5	6	7
11	Winning is important in work and games ……..……	1	2	3	4	5	6	7
12	If you want to get something done right, you've got to do it yourself…...……..……..……..……	1	2	3	4	5	6	7
13	A group is more productive when members do what they want rather than what the group wants……..……..…	1	2	3	4	5	6	7
14	Success more important thing in life……..……..	1	2	3	4	5	6	7
15	The choice, I would rather do alone where I can work alone rather than doing a job where I have to work with others in a group……...	1	2	3	4	5	6	7
16	People in a group should realize that they sometimes are going to h have to make sacrifices for the sake of the group as a whole……..	1	2	3	4	5	6	7

17	What happens to me is my own doing…... ……..……	1	2	3	4	5	6	7
18	People is a group should be willing to make sacrifices for the sake of group well-being…….…….……	1	2	3	4	5	6	7
19	Doing your best isn't enough; it is important to win…….	1	2	3	4	5	6	7
20	A group is most efficient when its members do what they want to do rather than what the group them to do……..…..	1	2	3	4	5	6	7

Appendix B
Efficacy Measures

For this plank abdominal exercise (shown in above), please rate your confidence for how many seconds that you can hold this exercise:

For example, if you have complete confidence that you can hold this exercise for 40 seconds, you could circle 10. However, if you are only somewhat confident, you would circle a number in the mid-range of the scale. And, if you were not at all confident that you could hold this exercise for 70 seconds, you would circle zero on the scale.

	Not Confident				***Somewhat Confident***						***Completely Confident***
For 1 minute	0	1	2	3	4	5	6	7	8	9	10
For 1 minute and 10 seconds	0	1	2	3	4	5	6	7	8	9	10
For 1 minute and 20 seconds	0	1	2	3	4	5	6	7	8	9	10
For 1 minute and 30 seconds	0	1	2	3	4	5	6	7	8	9	10
For 1 minute and 40 seconds	0	1	2	3	4	5	6	7	8	9	10
For 1 minute and 50 seconds	0	1	2	3	4	5	6	7	8	9	10
For 2 minutes	0	1	2	3	4	5	6	7	8	9	10
For 2 minutes 10 seconds	0	1	2	3	4	5	6	7	8	9	10
For 2 minutes 20 seconds	0	1	2	3	4	5	6	7	8	9	10

For this plank exercise, please rate your confidence that how many seconds (sum of seconds) that YOU and YOUR PARTNER can hold this exercise together:

	Not Confident				***Somewhat Confident***						***Completely Confident***
For 2 minutes	0	1	2	3	4	5	6	7	8	9	10
For 2 minutes and 20 seconds	0	1	2	3	4	5	6	7	8	9	10
For 2 minutes and 40 seconds	0	1	2	3	4	5	6	7	8	9	10
For 3 minutes	0	1	2	3	4	5	6	7	8	9	10
For 3 minutes and 20 seconds	0	1	2	3	4	5	6	7	8	9	10
For 3 minutes and 40 seconds	0	1	2	3	4	5	6	7	8	9	10
For 4 minutes	0	1	2	3	4	5	6	7	8	9	10
For 4 minutes and 20 seconds	0	1	2	3	4	5	6	7	8	9	10
For 4 minutes and 40 seconds	0	1	2	3	4	5	6	7	8	9	10

Appendix C
Sense of Unity Scale

How much did you feel you were on the same team with your partner? (Circle)

Not at all			**Somewhat**			**Very much**
1	2	3	4	5	6	7

How much did you think of your partner as a teammate? (Circle)

Not at all			**Somewhat**			**Very much**
1	2	3	4	5	6	7

How much did you enjoy working together with your partner? (Circle)

Not at all			**Somewhat**			**Very much**
1	2	3	4	5	6	7

Appendix D
Self-talk Manipulation Check

Did you use as self-talk the statements that you recorded and listened? Yes No

If yes, were the statements helpful to increase your confidence in your **individual** performance?

Not at all				**Somewhat helpful**					**Very helpful**
1	2	3	4	5	6	7	8	9	10

And, were the statements helpful to increase your confidence in your **team** performance?

Not at all				**Somewhat helpful**					**Very helpful**
1	2	3	4	5	6	7	8	9	10

Appendix E
Demographic Questionnaire

Age: _____ Gender (please circle): Male Female

Do you participate in sport activities, either competitively or socially? Yes No

Overall, how would you classify your involvement in these sport activities? (please circle a category):

Mostly individual	More individual than team-based	Equal mix of both	More team-based than individual	Mostly team-based

During the past two weeks, how many <u>total hours</u> have you spent training for sport or playing sport?

_____

What is your race? (please circle a category)

White/ Caucasian	Black/ African American	Hispanic	Asian/ Pacific Islander	Arabic/ Middle Eastern

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