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A CONTROLLED EVALUATION OF A COMPREHENSIVE MENTAL SKILLS PROGRAM FOR NCAA AND YOUTH CLUB SWIMMERS

by

Kevin Matthew Lancer

Master of Arts
Pepperdine University
1999

A thesis submitted in partial fulfillment
of the requirements for the

Master of Arts Degree in Clinical Psychology
Department of Psychology
College of Liberal Arts

Graduate College
University of Nevada, Las Vegas
December 2003

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Thesis Approval

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A Controlled Evaluation of a Comprehensive Mental Skills Program for NCAA and Youth Club Swimmers

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1017-53

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ABSTRACT

A Controlled Evaluation of a Comprehensive Mental Skills Program for NCAA and Youth Club Swimmers

By

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Previous studies have established that mental skills training is an effective intervention for improving performance in athletes. Relaxation, imagery, and mental preparation interventions have demonstrated efficacy in the improvement of athletic performance. However, relaxation combined with imagery is more effective than either one alone. Similarly, past studies have indicated mental preparation interventions may be more effective in the improvement of athletic performance when combined with other interventions. In team sports such as swimming, optimum performance has been found to improve cohesion. However, whether cohesion leads to improvements in sports performance is undetermined. In this study, a multiple baseline across team sports methodology was utilized to evaluate the effectiveness of cohesion and multi-component interventions in swim performance. The study included thirty-nine NCAA swimmers, and twelve Youth Club swimmers. Results indicated that the cohesion intervention appeared to enhance swim trial times for males, and female youth swimmers. However, this

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intervention did not appear to influence trial times for NCAA women. Interestingly, the relationship between cohesion and swim performance did not appear to be a direct one. Although improvements in swim trial performance were noted for males and youth swimmers consequent to the implementation of the multi-component intervention, the evaluation of this component was not controlled. Thus, the latter result must be interpreted with caution. Study implications are discussed in light of these results.

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CHAPTER 1

INTRODUCTION

This study is an attempt to enhance performance in male and female swimmers by conducting a controlled comparison between multi-component and cohesion interventions. This study will also attempt to make a contribution to the existing body of knowledge in the field of sports psychology by addressing previous concerns noted by researchers in the areas of multi-component interventions and idiographic approaches to intervention construction. The intent in using a multi-component intervention was to construct a package containing the skills necessary for a "total treatment success" (Azrin, 1977, as quoted in Patrick and Hrycaiko,1998). Weinberg and Comar (1994) noted that "most recent applied sport psychology interventions no longer use a single (intervention) procedure," and in Vealey's (1994) review of sport psychology intervention research published between 1989 and 1994, 67% of the studies were found to employ multi-component interventions. In this case, the multi-component intervention was defined as being composed of (1) mental skills training; (2) imagery; (3) and cue-controlled relaxation. Other researchers have successfully utilized this approach previously. Patrick and Hrycaiko (1998) labeled their multi-component intervention as a "mental training package" and utilized imagery rehearsal, self-talk, and relaxation with a group of four athletes. Their results indicated the mental training package was effective at improving running performance, with athletes reporting themselves "pleased" with the

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results, and coaches feeling the results were "important." Hamilton and Fremouw (1985), as well as Kirschenbaum and Bale (1984) both report that participants using the mental skills in combination with each other provides a more powerful intervention due to the interrelatedness of the skills. The same principle applies to the other two components of the multi-component intervention (i.e., imagery and relaxation), with several researchers (Suinn, 1977; Weinberg, Seabourne, & Jackson, 1981) reporting that imagery combined with relaxation is more effective than imagery alone for enhancement of athletic performance.

Cohesion has been defined as the resultant of all forces causing members to remain in the group (Festinger, Schachter, and Back, 1950). Optimum performance in sports has been found to improve team cohesion (Mullen & Cooper, 1994), but research results on whether cohesion leads to improvements in sports performance have been mixed (Carron, 1988; Cox, 1990; Gill 1986; Mullen & Cooper, 1994) with the cohesion-performance relationship described as "positive in interacting teams, but negative in coacting teams.

In terms of the direction of the relationship between cohesion and performance, prior investigations suggest stronger support for the quality of performance impacting cohesion relationship than the quality of cohesion impacting performance relationship (Widmeyer, Carron, & Brawley, 1993). Additionally, it was shown (Carron & Spink, 1993) that the cohesiveness of exercise groups could be enhanced by utilizing team building concepts within a psychological intervention. Thus, the choice of cohesion as a comparison intervention was based on the research consensus that improving cohesion in a coacting sport would not enhance performance, and that research support was stronger

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for the performance-cohesion relationship than the cohesion- performance relationship.

In this study, swimming is the sport under examination, and is described as a "coacting" sport, in which team success is determined by the sum of the independent performances of each individual athlete, performing the same skills. In coacting sports, cohesion has been thought of as detrimental to optimum performance, with rivalry producing the best performance in independent tasks. The detrimental effect of cohesion was explained by Carron (1988) as possibly occurring when athletes became too concerned with the welfare and feelings of coactors, thus detracting from their own performances.

This study adopted the definition of cohesion proposed by Carron, Brawley, and Widmeyer (1998), to wit " a dynamic process that is reflected in the tendency of a group to stick together and remain united in the pursuit of its instrumental objectives and/or for the satisfaction of member affective needs." This study will also utilize the conceptual model of cohesion developed by Carron, Brawley, and Widmeyer (1985) in their development of the Group Environment Questionnaire, with specific exercises in the cohesion intervention to address both the task-oriented and socially oriented concerns of the group.

This study also attempts to address an oft-voiced criticism in sport psychology interventions: namely, that packaged psychological interventions in sport are heir to the same difficulties that nomothetic programs do in other areas of clinical application (Kirschenbaum, 1992; Meyers, Whelan, Murphy, 1996;). Weinberg, Jackson, and Seaboune (1985) made a specific recommendation regarding mental preparation when they opined that future mental preparation techniques would need to be individualized in

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response to the athlete's needs in order for maximum effectiveness to take place. Robazza & Bartoli (1998) further refined Weinberg et al.'s recommendation in commenting that " the idiosyncratic nature of the athlete's competition strategies highlights the need of gaining information about the particular demands of the sport and the mental procedures spontaneously developed by the performer (in order) to provide suitable counseling or psychological interventions."

Taken as a whole, there is an increasing body of research that empirically demonstrates the effectiveness of psychological interventions, and mental training programs, in enhancing athletic performance (Weinberg & Comar, 1994). In clinical applications, the majority of published studies cite the use of multi-component interventions, utilizing techniques such as mental preparation, relaxation, imagery, arousal management, and psychological skills training packages. Numerous researchers also suggest the adaptation of these general interventions to the specific needs of the individual athlete (Balague, 1999; Giges & Pettipas, 2000; Kerr, 1993; Lines, Schwartzman, Tkachuk, & Martin, 2000; Orlick, 1989; Weinberg & Comar, 1994). Interestingly, studies that do attempt to follow that recommendation have either been case studies or had a very small N. This study will attempt to idiographically adapt interventions for each participant that have demonstrated empirical efficacy on a nomothetic level.

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CHAPTER 2

LITERATURE REVIEW

The following sections will provide a literature review of controlled studies supporting the efficacy of each component in this thesis: mental preparation, imagery, relaxation and cue- controlled relaxation, and cohesion, along with a brief history of the research in the area. Additionally, a literature review on nomothetic vs. idiographic approaches in sport psychology and studies detailing the efficacy and application of the idiographic approach will be provided. The articles referenced were obtained by conducting literature searches on the electronic databases for ***Psychinfo*** and ***SportDiscus*** .

Mental Preparation

There is no succinct definition of mental preparation in the sports psychology literature. In fact, in reviewing the literature, the concept of mental preparation itself has been broken down into several components, those individual components researched, and all then lumped together under the general rubric "mental preparation."

In the first study in this area (Shelton & Mahoney,1978), mental preparation was used synonymously with "psyching up," and that use has subsequently persisted to this day. More commonly, mental preparation has come to loosely describe various mental techniques athletes use to prepare themselves for competition.

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Researchers agree that athletes utilize mental preparation techniques (Mahoney & Avener, 1977; Orlick & Partington, 1988), and that elite and successful athletes tend to utilize mental preparation more than lower level, or less successful athletes (Defrancesco & Burke, 1997; Barr & Hall, 1992; Salmon, Hall, & Haslam, 1994; Scott, Scott, Bedic, & Dowd, 1999). Research has also revealed that there are actually multiple techniques being subsumed under the main heading of mental preparation, such as: arousal control, self-talk, motivational self-talk, focusing, imagery, adaptive coping, anxiety concentration, and cognitive technical preparation (Thiese & Huddleston,1999).

The following sections will attempt to give an overview of the various components of mental preparation and provide a rationale for the selection of the mental preparation techniques employed in this study.

Psyching Up: Increasing Arousal

The first study to evaluate mental preparation in athletes was conducted in 1978 by Shelton and Mahoney and utilized Olympic weightlifters. Subjects that were instructed to "psych themselves up" in the 30 seconds immediately prior to a hand strength task demonstrated greater strength than subjects who were instructed to count backwards in the 30 seconds prior to the strength task. Overall performance improved reliably in the psych-up period when compared to two control conditions. Athletes descriptions of their strategies for arousal varied greatly, but commonly reported utilizing imaginal rehearsal, attentional focus, self-efficacy statements, and focusing on the arousal itself.

Weinberg, Gould, and Jackson (1980) contend that these "psyching-up" efforts are supported by the assumption that "mental preparation heightens arousal, thereby

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preparing the athlete to meet performance demands." Landers (1980), as well as Mahoney and Meyers (1989) concluded that arousal seems to be essential for optimal response to the demands of competition.

The "psych-up" effect has been replicated in studies with both athletes and non-athletes. Gould et al. (1980), and Tynes and McFatter (1987) found strength performance, including leg strength to be "reliably superior " after mental preparation to strength performance after cognitive distraction on a variety of tasks. Caudill and Weinberg (1983) found similar results with muscular endurance as well as sprinting (Caudill et al., 1983). The same study also found that the length of time spent "psyching-up" was inconsequential.

While results from these and other studies have been impressive, several problems have been noted by various researchers. Donohue et al. (2001) pointed out that techniques and strategies used to induce the "psych-up " have not been standardized, thus making it difficult to improve those strategies in research, as well as complicating the process of comparison of athlete's own idiographic "psych-up" procedures; i.e. that "it should probably not be assumed that mental preparation strategies will demonstrate similar effects across sports." Additionally, several researchers found that performance improvements did not occur using mental preparation techniques when the tasks involved novel, complex coordination, balance, and speed skills rather than strength (Weinberg et al., 1980; Weinberg, Gould, & Jackson, 1981; Whelan, Epkins, & Meyers, 1990). Whelan (1990) subsequently theorized that the novel tasks requiring complex speed and balance skills may require either a low or high arousal level coupled with a high level of task mastery for maximum performance.

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Self Talk

In keeping with Weinberg et al's recommendation, a descriptive study conducted by Hardy, Gammage, and Hall (2001), athlete use of "self-talk" was examined in order to develop a foundation for theoretically based self-talk research in sport. Utilizing an approach employed by Munroe, Giacobbi, Hall, and Weinberg (2000) to examine athlete's use of imagery, they asked athletes (N=150; 72 female) from a variety of individual and co-acting sports four questions: Where, What, When, and Why (the four W's of self-talk). They found that athletes use self-talk most frequently prior to actual competition in their sports, then next frequently during practice, then during competition. Before practice, after competition, and after practice were the most infrequent times for self-talk to occur. Athletes used self-talk while at the practice or competition location most frequently, then at home as the next most likely place.

The most frequently occurring categories in terms of what athletes actually say to themselves were task instruction and structure. Task instructions had two primary aspects: skill specific ("keep my head up") and general ("Stay tough throughout the whole race"). Structure is sub-divided into three categories, and represents the manner in which athletes talk to themselves. Cue words (e.g., "Focus", "breathe", "explode"); phrases (e.g. "high elbow", "move it"); and full sentences (e.g., "You've done the work, now get going"). Phrases were the most frequently used type of self-talk, with cue words being used slightly more often than sentences. Previous research (Landin, 1994) has encouraged the use of short, simple self-talk when learning skills. Athletes in this study used the first person (I, Me) almost equally as often as the second person (you).

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Lastly, the function, or why, of self-talk was examined. Two main functions were uncovered: cognitive and motivational. Overall, athletes reported more frequent use of motivational self-talk rather than cognitive self-talk. In a separate study that did not make a distinction between the types of self-talk, Thiese & Huddleston (1999) found, in a sample of female collegiate swimmers (N=147) that positive self-talk, goal setting, and music for psych-up were utilized "almost always " by the subjects.

Rushall (1984) also suggested that self-talk may serve several motivational functions for the athlete as well, and suggested classification of self talk into three categories. Task specific statements, which are technique related; Mood words, which describe task characteristics, such as "explode", "sharp", or "smooth"; and Positive self-talk that would serve to reduce fatigue, increase effort, focus attention, and increase confidence. Rushall (1988) found that although the most effective form of self-talk was task-specific, all three types did in fact improve performance in a group of elite cross-country skiers.

Other research examining task-specific self-talk (Ming & Martin 1996; Rushall et al., 1988) utilizing cue words to focus the athlete's attention relevant to the task at hand indicated that performance levels of both novice and skilled athletes have been improved by the use of self-talk.

Mental Skills Training

Previous studies have established that mental skills training is an effective intervention for improving performance in athletes (Donohue, Barnhart, Covassin, Carpin, & Korb, 2001; Hardy, Gammage, & Hall, 2001; Patrick & Hrycaiko, 1998;

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Smith, Gill, Crews, Hopewell,& Morgan, 1995; Terry, Mayer, & Howe, 1998; Thiese & Huddeston, 1999). Mental preparation tasks have typically involved: focus on states of optimum arousal; confidence building; constructing clear tactical strategies; concentration on technique and sport-specific technical as well as motivational statements; and extreme confidence (Donohue, Barnhart, Covassin, Carpin, and Korb, 2001; Gould, Ekland, Jackson, 1992).

In examining the differences between successful and non-successful athletes, numerous studies have also confirmed that successful elite athletes are highly proficient in applying psychological skills, including arousal control, self-talk, focusing, imagery, and coping with mistakes and anxiety (Mahoney & Avener, 1977; Orlick & Partington, 1988). Robazza and Bartoli (1998) conducted detailed interviews with 8 Italian Olympic archers investigating mental preparation strategies adopted for competition and psychological factors associated with excellence. Their analysis indicated that the archers felt that concentration, technical preparation, positive expectations, facilitating emotions, and body awareness were the mental aspects of effective performance.

The implementation of various mental skills, or mental preparation techniques immediately prior to engaging in a competitive or training sport activity has long been advocated by coaches as a means of getting athletes emotionally and psychologically ready for their upcoming events. Jackson and Roberts (1992) propose the time of competition as optimal for implementing confidence building strategies with athletes, and that focus should be directed towards technical tasks related to performance as the time of competition approaches.

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Arousal –Performance Relationship

The arousal-anxiety-performance relationship has elicted interest since at least 1908 with the work of Yerkes and Dodson. While considerable research has been conducted since then, various theoretical explanations have "failed to account for available research findings" (Mahoney & Meyers, 1989; Meyers, 1996).

The relationship of increased arousal to enhanced athletic performance is uncertain. A partial explanation lies in the fact that no study has yet documented that the mental preparation strategies being utilized produce physiological arousal (Meyers et al., 1996). Arousal effects have been measured most frequently utilizing change in measures of state anxiety (Meyers, 1996). In 1990, Whelan reported that performance on a motor-skills task was not related to heart rate changes that occurred during the psych-up period.

Terry and Mayer (1998) assessed the effects of a mental training program on state anxiety, respiration rate, and performance of novice scuba divers (N=44). Fatalities in scuba diving related to anxiety (panic) while diving have been put at 19% of all diving fatalities (McAniff, 1990), and in a survey of 254 certified scuba divers (Morgan, 1987) 54% reported they had panic or near panic experiences while diving. Terry et al. examined multidimensional anxiety theory (Martens, Vealey, & Burton, 1990), which proposes that state anxiety has both somatic and cognitive components. These components have differential impacts on performance, with cognitive anxiety characterized by worries about performance, negative self-talk, and difficulties in focusing or images of failure. Somatic anxiety is characterized by manifestations of autonomic arousal (i.e., increased heart rate, sweaty palms, muscle tension). Foundational to multidimensional anxiety theory is that performance will be better predicted by

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cognitive anxiety and self-confidence than somatic anxiety. The researchers used the State-Trait Anxiety Inventory (STAI: Spielberger, Gorsuch, & Lushene,1970) as the measure of trait anxiety, and the Competitive State Anxiety Inventory-2 (CSAI-2: Martens, Burton, Vealy, Bump, & Smith, 1990), to measure state anxiety prior to diving. Over 4 weeks, each participant received the standard12 hr PADI Open Water Diver Course. The control group (N=14) received only the PADI course, a placebo (N=15) group received an audiotape containing only general statements about diving, while the intervention group (N=15) received a diving-specific mental training program (Mount & Gilliam, 1992). The mental training program was recorded on an audiocassette tape, 60 minutes in length, and divided into three 20 minute segments, with the intervention itself requiring another seven hours of training. Results indicated that the intervention group "reported lower pre-dive scores for cognitive anxiety, higher pre-dive scores for self-confidence, performed better on diving specific tasks, and had lower respiration rates than either the control or placebo group." The authors felt their results made a "sound case " for the use of mental training as part of novice diver preparation. In a single case study, Prapavessis, Grove, McNair, and Cable (1992) utilized a multimethod cognitive behavioral program to help an elite rifle shooter reduce state anxiety and improve performance.

Overall, the insufficiency of current theoretical explanations on the arousal-anxiety-performance relationship has led to a search for other mediating variables of consequence in the relationship. Task experience, presence of spectators or other competitors, the importance of performing at that particular event or moment, athlete's perceptions of ability to control or manage changes in arousal, and their situational

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perception of anxiety have all emerged as potential mediators in the arousal-anxiety-performance relationship (Meyers et al, 1996). Meyers goes on to conclude that "the athlete's perception of the anxiety and his or her ability to manage it may be the variables most highly related to performance." He is in agreement with Lazarus's (1966) model of stress and coping, which predicts a correlation between perceived ability to cope and physiological, as well as psychological stress.

Mental Preparation Statements

The utilization and efficacy of mental preparation statements by athletes prior to, and during competition has been well documented. Planned self-statements were shown to be effective in improving athletic performance in practice (Rushall, Hall, Roux, Sasseville, & Rushall, 1988; Russhall & Shewchuk, 1989). Hamilton and Fremouw (1985) also found that the planned self-statements improved transfer of skills from practice to athletic competition.

In light of the research of Meyers and the others cited herein, it would seem advantageous to proceed as Donohue et al. (2001) have recommended. They proposed that athletes be involved in the development of their own specific mental preparation strategies, hopefully increasing athlete treatment compliance, while utilizing the oft-recommended idiographic approach. Additionally, Donohue also recommended standardizing procedural guidelines enabling comparisons and ease of replication of outcome results. In doing so, he is supported by the research of Weinberg, Jackson, and Seaboune (1985). In an undergraduate weight training class, they conducted a controlled comparison (N=24) on multiple strength tasks. They improved upon the standardization

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of instructions given to subjects in their previous study (1980), and broadened the tasks involved. They found that for all tasks, the interventions were equal, and more effective than the control condition of counting backwards. Weinberg et al. concluded that since both specific (imagery, arousal preparation) and non-specific ("psych-up") mental preparation techniques were equally effective, the most efficacious approach would be to let athletes use their own method of preparation prior to performance, rather than spending the time to teach them ways to prepare. The authors further concluded that " maximum effectiveness would most likely occur if future mental preparation techniques were individualized to accommodate the athlete's specific needs".

The following five sections will discuss several different aspects of mental preparation statements: (1) Attentional focus: Associative vs. Dissociative strategies; (2) Associative Strategies and Segmenting; (3) Covert vs. Overt Self-statements; (4) Initiating Self-statements; and (5) Positive vs. Negative phrasing in self-statements.

Attentional Focus : Associative vs. Dissociative strategies

A primary research question in the use of planned self-statements has been that of attentional focus. Mallett and Hanrahan (1997) contend that "the athlete who focuses on the task at hand rather than the outcome is more likely to perform optimally." After conducting interviews with 75 Canadian Olympic athletes, Orlick and Partington (1988) concluded attentional focus was one of the most important athlete skills directly affecting high performing levels at the Olympics.

This issue of focus also touches on how "associative" vs. "dissociative" cognitive strategies affect performance. Dissociation was defined by Morgan (1978) as an athletic

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strategy utilizing performance distraction to blockout sensory feedback from the muscles. Common dissociative strategies reported by athletes were listening to music, imagining a favorite location or experience, and playing mental games. Dissociative strategies have produced enhanced performance in several studies (Gill & Strom, 1985; Morgan, 1981; Okwumabua, Meyers, Schlesser, & Cooke, 1983; Pennebaker & Lightner, 1980; Rejeski & Kenney, 1987). In a controlled study by Morgan, Horstman, Cyerman, & Stokes (1983), using fifteen army male subjects, they demonstrated that runners using a dissociative strategy showed more endurance during a treadmill task than controls.

In associative strategies, the athlete is focusing on physical sensations and cues, such as pace, rate of turnover, perceived effort, race position, and power (Donohue, et al., 2001; Scott , Scott, Bedic, & Dowd, 1999). Performance enhancement results as the athletes control their own effort and make adjustments accordingly, as they maintain awareness of the factors most critical to performance (Weinberg, Smith, Jackson, & Gould, 1984). In a 1977 interview study conducted with marathon runners by Morgan and Pollock, they found that elite marathoners predominantly used an associative cognitive strategy, while the less accomplished used a cognitive strategy that was primarily dissociative.

Additional research showing performance enhancement utilizing associative strategies comes from Smith, Gill, Crews, Hopewell, and Morgan (1995), who examined psychological states on running efficiency. They found that subjects (N=36) who were found to be the most economical runners, as measured by running efficiency (RE; the amount of oxygen consumed at a given submaximal running velocity) used less dissociation and more relaxation during racing than the least economical runners. Both

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groups used associative strategies at about the same level of frequency, and results did not differ significantly by gender.

In a multiple baseline study utilizing rowers (N=9) conducted by Scott, et al., (1999) evaluating associative strategies vs. dissociative-video vs. dissociative-music strategies on rowing ergometer performance, they found that while performance improved under all conditions, the greatest gains were found in the associative condition.

Additional research has produced inconclusive results (Clingman & Hilliard, 1990; Masters & Lambert, 1989; Rejeski & Kenney, 1987; Silva & Applebaum, 1989), which may be the result of several factors, such as reliance on post-event interviews to determine which strategies the participants employed, thus depending on the accuracy of subject recall and ability to precisely describe their dominant strategy; secondly, the variety of endurance tasks employed in the research; and lastly, the differing levels of athletic experience and ability among and between subjects.

The greatest part of the variance in research results may be accounted for by the difference between novice and elite athletes. Novice athletes tend to dissociate (Okwumba et al., 1987); Scott et al., (1999) suggests an athlete who does not have the motivation or possess the physical skills to tolerate the pain, boredom, and fatigue which can occur when employing associative strategies will tend to use dissociative strategies. From a novice athlete point of view, dissociation makes sense when their goal is participation, learning a new skill, or simply recreation. As noted previously, numerous studies show that elites tend to employ associative strategies.

Finally, in the realm of applied sport psychology, favorable anecdotal reports on the use of associative strategies written by practicing sport psychologists have appeared

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in the non-research literature (Nideffer, 1981,1993; Orlick, 1986; Orlick & Partington, 1988; Winter & Martin, 1988, 1991).

Associative Strategies and Segmenting

Winter and Martin (1988) suggested breaking the competition into segments, thus facilitating the athlete's ability to focus on the present moment, rather than dwelling on the past or anticipating the future, thus optimizing performance.

Mallett and Hanrahan (1997) investigated the effects of a specific cognitive race plan on 100 meter sprint performance in 12 elite sprinters (11 male) utilizing a multiple baseline design. All participants were randomly assigned to three equal number groups, and the intervention was staggered across all three groups. Group A performed the first two trials under control (normal) conditions, then the subsequent six trials under experimental conditions. Group B performed the first four trails under control conditions, and the next four under experimental conditions. Group C competed the first six trials under control conditions, and the last two under experimental conditions.

Specifically, all participants completed two trials of 100 meters on each of four separate testing days spread out over a seven day period. Sufficient recovery time was provided between trials (20 minutes) and between testing days (48 hours) to eliminate the effects of fatigue on performance. All eight trials were conducted beginning one week after the national championships to insure that all athletes were in the same phase of their training. The intervention consisted of use of "race cues", with the 100 meter race being divided into three sections and specific cue words associated with each section. They were "push", in the acceleration phase (0-30 meters); "heel", in the maximum velocity phase (30-60 meters); and "claw", in the speed endurance phase (60-100 meters). Timing

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lights were placed at the 30 and 60 meter marks to prompt the change of attention and cue word. All participants indicated that they understood the significance of the cue words.

Results indicated that 11 of the 12 participants improved their times compared with the control condition using the "specific cognitive race plan" (cue words), with $p < .005$. More consistent sprint performances were also produced, and subjective evaluations by the participants were unanimous in endorsing the use of the race plan for improving sprint performance.

Covert vs. Overt Self-statements

In addressing another issue on the application of the planned self-statements, Ming and Martin (1996) proposed that self-talk performed overtly (out-loud) may be more effective at influencing overt behavior than covert (private) self-talk. However, with certain notable exceptions (Muhammad Ali), employing overt self-statements has been met with reluctance by athletes for several reasons, notably the difficulty or appropriateness of using self-statements in certain sport situations, as well as possible negative perceptions of what others may think. Covert, or private self-talk has disadvantages as well, such as their effective use may require training and be difficult to monitor.

Initiating Self-statements

In a controlled study by Donohue et al. (2001) trained research assistants were used to initiate the self-statements, with statements made overtly. In this study, participants were six Caucasian female NCAA Division I cross-country runners between

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the ages of 18-21. Three mental preparation procedures were evaluated. In the first, a list of motivational statement (i.e., "Today is your day", You've worked hard for this") was generated by each of the six participants as well as four other athletes not involved in the study. This resulted in a list of 15 motivational statements unique to each individual. The intervention consisted of a trained research assistant overtly stating the individuals' unique motivational statements in the 5 minutes immediately preceding a 1000 meter trial run. One statement was made every 10 seconds, with the list being repeated after all the statements were completed.

In the second intervention, the coach developed a list of technical statements related to optimum performance (i.e.," get an explosive start", "point toes straight ahead"). The 6 participant athletes also developed a list of actions consistent with performance of the "perfect run" (i.e., "get on my toes and lift my knees high").

This resulted in a 15 –item list arranged in a race chronological order that was unique to each individual. The intervention was administered by a trained research assistant in the same manner as the first intervention.

The third condition was utilized as the control. Subjects were asked two questions ("what are you thinking about, right now?", and "tell me how your body feels, right now?") every 30 seconds in the 5 minutes immediately preceding a practice 1000 meter trial run by the research assistants. Questions were alternated, and the research assistants were trained to respond with neutral head nods. Participants in three conditions were instructed to engage in their usual warm-up routine. Results indicated that while all three interventions resulted in improved performance, the instructional and motivational

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statements were the most promising, as well as being rated more effective by the athletes themselves.

Positive vs. Negative phrasing

In applied sport psychology it has been assumed that negatively phrased performance statements were less efficacious than positively phrased statements. The origins of that assumption are unclear, and certainly have an anecdotal basis in coaching lore. From a motor learning perspective, effective training is based on a constant emphasis on ideal or flawless performance. Norman and Shallice (1980), as cited in Lippman (1990), argue that simply mentioning an erroneous pattern would in fact integrate that inappropriate schema. Another possible rationale for the emphasis on positive self-statements may be found in the behavioral modification literature, drawing from Skinner (1968, as cited in Lippman, 1990), and the demonstrated advantage of positive reinforcement over punishment for effective performance alteration. Additionally, research in psycholinguistics has shown that people may have difficulty processing negative statements, and this difficulty may be even more pronounced in children, due to their relative lack of language proficiency (Eifermann, 1961; Wason, 1965, as cited in Lippman, 1990).

Research in this area has been minimal, and most studies have addressed the question indirectly, dealing primarily with pre-performance preparation (Feltz & Landers, 1983;Woolfolk, Murphy, Gottesfield, & Aiken, 1985). To address the aforementioned issue, Lippman (1990) conducted two experiments focused on the processes underlying performance. The first study used volunteers from an introductory psychology class (N=45). Subjects were assigned in rotation to either a control group, a negative phrasing

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group ("the task is not difficult"), or a positive phrase group ("the task is easy"), and were tested pre and post on a tracking activity. Results from the first experiment indicated that the various phrasing groups performance improved more than the control group, and from pre to post test, but remained unaffected by the type of phrasing. In the second study, the focus was changed to home in on any differences in performance associated with phrasing. To that end, the control group was eliminated and practice time was increased. Subjects (N=40) were student volunteers from an introductory psychology class. Results indicated a significant improvement in performance ($p < .01$) for all groups. However, significantly more relaxation ($p < .05$), lower tension ($p < .01$), and perceived accuracy ($p < .05$) on the required task were reported by positive phrasing subjects. Overall, subjects reported that mental practice helped their performance. Further, it was noted that positive phrasing had effects upon perceived task difficulty, motivation during mental practice, and perceived accuracy, tension, and relaxation during performance. However, results suggest that the impact of negative phrasing upon performance may have been overestimated and may be of less weight than previously given in mental training and physical instruction.

In summary, negatively phrased statements about performance have been assumed to be less effective than positively phrased statements. The above cited study casts doubts upon that assumption in applied sport psychology, showing no difference between the effects of positively or negatively phrased statements upon performance of a perceptual-motor skill. However, an effect was shown in the area of subject's attitudes towards being willing to engage in mental practice that was associated with positive phrasing, and willingness to practice is the *sine qua non* to intervention efficacy.

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Mental Preparation Summary

In this section, we have examined the varied facets of mental preparation, from psyching up, Self-Talk, Mental Skills Training, Arousal-Performance Relationship, Attentional focus (Associative vs. Dissociative strategies); Associative Strategies and Segmenting; Covert vs. Overt Self-statements; Initiating Self-statements; and Positive vs. Negative phrasing in self-statements.

Each aspect of mental preparation examined has demonstrated efficacy in controlled studies, although not unequivocally or without criticisms. However, the data gleaned supports the conclusion of efficacy for mental preparation as a valuable, practical performance enhancement strategy/tool when utilized with forethought. Especially noteworthy is the point made by several researchers, indeed a theme echoed elsewhere in applied sports psychology research: Techniques are most efficacious when adapted to the individual athlete.

One aspect of mental preparation that has been inconsistently addressed is duration. That is, what is the ideal length of a mental preparation program? For utilizing self-statements, what is the ideal temporal proximity to practice or competition for maximum efficacy? No controlled studies where timing of statements, or length of program as the independent variables were found.

Imagery

Anecdotal and descriptive reports by athletes and practicing clinicians indicate that imagery is the most prevalent form of mental rehearsal strategy (Meyers, Whelan, & Murphy, 1996), and has been heavily emphasized as an effective strategy for

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performance enhancement in self-help books for athletes (Weinberg & Comarl, 1994). Relatedly, after conducting interviews with 75 Canadian Olympic athletes, Orlick and Partington (1988) concluded that "attentional focus and quality and control of performance imagery were the most important athlete skills directly related to high levels of performance at the Olympic Games."

Given the emphasis on imagery expressed in the literature, there appears to be a lack of consistency regarding its delineation. For instance, Richardson (1969, as quoted in Martin, Moritz, & Hall,1999) denoted mental imagery as " those quasi-sensory and quasi-perceptual experiences of which we are self-consciously aware and which exist for us in the absence of those stimulus conditions that are known to produce their genuine sensory or perceptual counterparts." A simpler definition of imagery: " the covert practice of a physical task in the absence of gross muscular movement" offered by Corbin (1972) is more easily understood, but only addresses the cognitive aspects of imagery, and does not address the equally important motivational aspects of imagery .

Imagery Theories

Researchers have advanced several theories to account for imagery's effects on aspects of behavior, affect, and cognition. In their1999 review of imagery use in sport, Moritz et al. describe two theories of imagery that are consistent with psycho-physical functioning. Edmund Jacobson (1930) advanced psychoneuromuscular theory, which posits that vividly imagined events innervate the muscles similar to that produced by the actual execution of the movement. The finding that movement imagery produces the impulses used to perform the actual movement is known as the "Carpenter effect" after

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the individual who had proposed the "ideo-motor principle" (Carpenter, 1894, as quoted in Rushall & Lippman, 1997). Imagery may actually enhance the memory of the muscle for a task by having the muscles fire in the correct task specific manner, while not physically executing the movement, thus engaging the appropriate neuromuscular pattern. In a 1996 study with competitive swimmers, Gallego, Denot-Ledunois, Vardon, and Perruchet found that when imaging the competition scene, physiological measures (breathing, heart rate), significantly increased in a manner corresponding to the physiological reactivity associated with real-life events. These changes were noted in both the events immediately preceding competition, and the competition itself.

However, intensity is a factor that appears to be the main difference between a physical and mental initiation of a neuromuscular pattern (Rushall & Lippman, 1997). Fujita (1973, as quoted in Rushall & Lippman, 1997) studied muscular responses in well-trained athletes who either executed a physical skill or imagined performing that skill using EMG recordings. He found similar patterns of muscle utilization, with differences between the amplitudes of the physical and imagined performances, with the imagined amplitudes being smaller. A 1999 study by Lotze and Montoya (N=10, 5 female) using fMRI (functional magnetic resonance imaging) to examine cortical activity during actual and imagined movement obtained similar results. Their findings support the hypothesis that "motor imagery and motor performance possess the same neural substrates."

The second major theory comes from symbolic learning theory, and was proposed by Sackett (1934). He sees imagery functioning as a "cognitive coding system", helping athletes acquire, understand, and strengthen the "mental blueprints" for

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movement patterns, thus enabling those movements to become more familiar, if not automatic.

Sackett (1934) showed that imagery improved performance on a cognitive task (finger maze) that was easily symbolized. Symbolic learning theory predicts that learning an easy task (i.e., a task more cognitively oriented), should benefit more from imagery use than a difficult, or less cognitively oriented task. As predicted, Ryan and Simmons (1983, as quoted in Hall, 2001) found imagery practice superior to no practice only for the easier task. However, while symbolic learning theory explains how a novice might benefit from using imagery, in that it strengthens the mental blueprints of the skills being learned, it does not explain how imagery enhances performance in an experienced performer, who has already mastered the skills specific to their task. Additionally, it does not provide any rationale for determining the size of the cognitive component in any particular motor task.

Two other theories worthy of note are Bioinformational theory and Dual Coding theory. Bioinformational theory (Lang, 1977) originally attempted to explain the psychophysiology of imagery with respect to anxiety disorders and phobia. Lang posits that in bioinformational theory, any image holds information about stimulus and response propositions. Stimulus propositions communicate information about the imagined environmental stimuli; response propositions transmit information about behavioral activity. A response proposition is modifiable; an imaged response proposition may have a substantial impact on an individual's reaction in a real-life situation. For instance, if a basketball player were to include physical symptoms of arousal while imaging being at the free throw line, bioinformational theory predicts that this would be more beneficial to

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his performance in an actual game situation than imagery that did not include the arousal symptoms.

Dual Coding theory offers a reasonable explanation for how imagery can link action and language. It was Paivio's work with dual coding theory that led to the development of the Sports Imagery Questionnaire (SIQ), discussed in detail in a later section of this imagery review. Annett (1988) has described a link between the two independent "channels" of dual coding theory known as the action –language bridge. The first channel encodes human action, and is specialized for motor activity. The second is the verbal channel, and encodes written and spoken language, as well as linguistic gestures. The bridge enables an action to be described, generated, and verbal instructions to be acted upon. Foundational to dual coding theory is that better learning is produced when information is encoded in both channels than only one of them, the idea being that a verbal cue may prompt, via imagery performance, an otherwise not remembered action.

However, these theories fall short by focusing on the improving motor skill performance aspect of imagery, and do not address the much wider range of imagery applications noted in both athlete self-report and by practicing sport psychologists. Conceptually, imagery has been viewed as playing both cognitive and motivational functions in athletic performance. Paivio (1985) made a functional distinction in his analysis of imagery functions, suggesting that both the cognitive and motivational functions could be targeted towards either specific or general behavioral goals. He viewed the four functions of imagery as motivational general, utilizing images involved in emotional or general physiological arousal (i.e. to induce relaxation, or to "psych up"); motivational specific, utilizing goal oriented imagery (i.e. imaging standing on the

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podium, winning an event, etc.); cognitive general, focusing on imagery strategies related to a specific competitive event (imaging scenarios to counter an opponent' s anticipated behavior); and cognitive specific, using imagery to rehearse, enhance, or gain specific perceptual- motor skills. While not without it's own limitations, such as the inability to predict the optimal imagery strategy to use to obtain the desired effect in various sport situations, Paivio's model provides the theoretical basis for a detailed examination of the efficacy of imagery, and has led to the psychometric development of an instrument to discern athlete use of the various types of imagery.

Development of the Sports Imagery Questionnaire (SIQ)

Using Paivio's (1985) original conceptualization, Hall, Mack, Paivio, and Hausenblas (1998) developed the Sports Imagery Questionnaire. The psychometric process of questionnaire development and subsequent factor analysis confirmed Paivio's conceptualization, with the addition of a fifth factor to Paivio's original four (motivational general, motivational specific, cognitive general, and cognitive specific). In addition to the original four factors listed above, the fifth factor came from dividing the Motivational General category into Motivational General-Arousal (MG-A), imagery associated with emotions and arousal, and Motivational General-Mastery (MG-M), imagery associated with being in control, confident, and mentally tough. The MG-M type of imagery is an extension of Paivio's original conceptualization, and indeed, athletes have reported more consistent use of imagery for its motivational functions than cognitive, or skill-acquisition functions (Hall, et al., 1998; Salomon, Hall, C., & Haslam, 1994). The higher reported use of motivational imagery over other forms of imagery

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makes sense when considering that athletes are also reporting more frequent use of imagery in competition than practice (Barr & Hall, 1992; Munroe, Giacobbi Jr., Hall, 2000; Munroe, Hall, & Simms, 1998). Simply, competition is for performance and goal achievement, and practice is for skill acquisition and getting better (Cognitive Specific Imagery).

In the third of a series of three experiments in their SIQ developmental study, Hall, et al. (1998) wondered whether imagery use as measured by the five subscales of the SIQ could predict performance in track and field athletes. Athletes (N= 180, 87 female) of varying levels (high school, varsity, and national) were asked to list their personal best time/distance, and the Mercier tables (Mercier & Beauregard, 1993, as quoted in Hall, et al., 1998), which are an objective measure of performance, were used to assign point values to their performance, with points being awarded differentially for females. Results indicated support for a significant relationship between imagery use and performance, except in high school female athletes and varsity male athletes. It is worthy of note that goal oriented imagery and imagery related to arousal control (i.e. motivational aspects of imagery) were better predictors of performance for elite athletes than for varsity or high school athletes. Hall et al. (1998) conclude "...it appears as though elite athletes (who have already conquered many of the skills necessary to be successful) employ imagery primarily to keep themselves motivated."

Efficacy of Imagery

The first studies regarding the efficacy of imagery appeared in the motor learning literature (Corbin, 1972; Richardson, 1967). Their work provided supporting evidence

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that "mental practice", or covert rehearsal, could aid in the acquisition and retention of complex motor skills. Indeed, in comparing covert rehearsal to no practice, Feltz & Landers (1983) found that covert rehearsal significantly improved skilled motor performance by about ½ standard deviation. Denis (1985) and Hal (1985) obtained similar results confirming efficacy of imagery rehearsal compared to a no-imagery control condition in improving specific perceptual-motor skills.

Richard Suinn (1972) reported that a combination of training in relaxation and imagery skills, and a behavioral rehearsal technique, improved race performances in ski racers. Suinn's work led to the increasing intricacy of mental practice interventions designed to enhance performance, much like the cognitive oriented clinical interventions popularized by Beck, Bandura, and Meichenbaum, among others (Meyers et al., 1996). Magill (1993) showed that imagery facilitates modeling and reduces coordination difficulties in the cognitive stages of learning.

Imagery combined with physical practice has been shown to facilitate the skill acquisition process and enhance performance, even in athletes as young as 10 years of age. In 1992, Li-Wei, Qi-Wei, Orlick, and Zitzelsberger conducted a controlled study using 40 children (Mean age 8.3 years) attending a sports school in Beijing, China, focusing on ping-pong. Participants were divided into three groups with equal age and gender distribution: experimental (video-observation, mental imagery training, and relaxation), observational (video-observation only), and control. Results indicated that children in the experimental group achieved significantly greater improvement in the technical quality and the accuracy of their shots compared to participants in the other two groups.

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Imaginal rehearsal has been successfully employed to improve athletic performance in basketball players (Meyers, et al, 1982); gymnasts (Start & Richardson, 1964); trampolonists (Isaac, 1992); dart throwers (Mendoza & Wichman, 1978; Wichman & Lizote, 1983); golfers (Woolfolk, Murphy, Gottesfeld, & Aitken, 1985); volleyball players (Shick, 1970), female divers (Grovios,1992), deep water runners (Brewer & Helledy, 1998) and swimmers (White, Ashton, & Lewis, 1979). Additionally, researchers (Page, Sime, & Nordell, 1999; Vadocz, Hall, & Moritz,1997) have found imagery to be effective in regulation of competitive anxiety levels as well as enhancing self-confidence. Imagery has been found to be efficacious in additional applications such as coping with pain and injury, modifying cognitions, regulating arousal, and managing anxiety and stress (Martin et al., 1999).

In conclusion, over 200 published studies examining the relationship between imagery and performance in sports have lent collective support to the idea that mental imagery of a particular skill can improve performance of that skill (Martin, et al., 1999).

Moderators of Imagery efficacy

Type of imagery used

Early research on imagery type used by athletes focused on the effects of positive vs. negative performance imagery. Several researchers have found that imaging successful performances to be beneficial (Caudill, Weinberg, & Jackson, 1983; White et al, 1979), and imaging athletic failure having negative effects (Powell,1973). In one well-controlled study, Woolfolk et al. (1985) used college students and measured their ability to putt a golf ball after randomly assigning them to one of three test conditions: success imagery, failure imagery, and no imagery. Results indicated that performance following

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positive imagery was better than performance without imagery and failure imagery, and performance without imagery was reliably superior to performance following failure imagery.

The perspective of visual imagery utilized by athletes has also been examined from two primary points of view: external imagery perspective (as if looking at themselves on a video), and internal imagery perspective (imagining what they would see if they were actually physically executing the skill). Study results have been mixed as to differences in preference for external vs. internal perspective based on athlete skill level (Hall et al. 1990; Mahoney & Avener, 1977). Hardy (1997) has suggested that use of each perspective is influenced by differing task demands. For instance, the external perspective is viewed as superior when utilized for the acquisition and performance of skills that are critically dependent on form such as gymnastics, karate forms, dancing (Hardy & Callow, 1999). The internal perspective is superior for acquisition and performance of skills that require anticipation and perception for optimal results.

Now, with the development of the SIQ (Hall et al., 1998), and the favorable psychometric properties of the SIQ, it appears that imagery use can be operationalized using SIQ subscale scores. For instance, in examining a study conducted by Burhans, Richman, and Bergey (1988) using imagery in a training program for beginning runners, participants who imaged perfect performance of the movements associated with running (Cognitive Specific imagery) showed greater performance improvements than those who imaged successful performance, such as crossing the finish line ahead of other competitors, being cheered, receiving awards, etc. (Motivational Specific imagery).

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Imagery ability

Research has consistently shown that the ability to kinesthetically and visually image motor skills is associated with improved sports performance (Martin, et al., 1999; Orlick & Partington, 1998). However, while almost everyone has the ability to create and use imagery, the degree of that ability may vary considerably (Paivio, 1986). When using Cognitive specific (CS) imagery strategies, athletes with high imagery ability have shown greater improvements in performance than those with low imagery abilities (Isacc, 1992; Ryan & Simons, 1981). Attempts have been made to measure individual imagery ability, most notably with the development of the Movement Imagery Questionnaire (MIQ, Hall & Prognac, 1983), the MIQ-Revised (MIQ-R.Hall & Martin, 1997) and the Vividness of Movement Questionnaire (VMIQ, Isacc, Marks, & Russell, 1986). These inventories have proven reliable (Martin et al., 1999), but imagery ability was not measured in this study.

Positive moderators

Research results have supported enhanced imagery effectiveness when clarity, or vividness, of the image is increased (Smith, 1989); relaxation skills are utilized (Lanning & Hhisanga, 1983); and images that are personally meaningful to the athlete, as well as specific to the task, are used (Hecker & Kaczor, 1988; Lee, 1990). Hardy et al. (2001) agrees with Martin, Moritz, & Hall's (1999) proposal that consultants should match the functions of imagery with the desired outcome.

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Gender

In 1992 study utilizing male and female rowers, Barr and Hall only found minor differences between the genders in imagery use. Similarly, a 1994 study by Salmon with male and female soccer players as participants, found very few significant differences in responses for imagery use. Munroe, Hall, Simms, and Weinberg (1998) found only a "few minor differences" between males and females on the Sports Imagery Questionnaire (SIQ) subscales, and did not consider gender as a moderator variable on their data analysis. Their study used 350 Canadian university varsity athletes (111 females) from a variety of interactive and coacting sports.

Skill level

However, in contrast to gender, a number of studies have shown that non-elites can be successfully distinguished from elite athletes by their imagery use alone (Hall et al., 1990; Morita, et al., 1996; Salmon, et al., 1994). Additional support for the difference between elite and non-elite use of imagery comes from interviews with athletes of varying levels of success. Those interviews have indicated that highly successful athletes tend to utilize imagery from an internal perspective, in which the athlete images themselves performing the task in question, replicating the actual visual, and possibly kinesthetic, perceptual information that they would experience during task execution. Less successful athletes used external imagery more often, which involves watching task performance from a third person perspective, possibly eliminating the kinesthetic aspect of the imagery (Harris & Robinson, 1986; Mahoney and Avener, 1977).

Interestingly, elite athlete performance is more closely related to the motivational functions of imagery (goal imagery, arousal management) when compared to high

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school or varsity level athletes. In contrast, cognitive imagery (skill acquisition) was more closely related to the performance of lower level athletes compared to elite athletes (Hall et al., 1998). Hall speculates that may be due to the fact that elites have already acquired, if not mastered, the skills necessary to perform at a high level and are more concerned with motivating themselves to perform well, as opposed to lower level athletes who may have skills yet to acquire and polish .

Variations in imagery use

Imagery use has been found to vary by the type of sport, whether coacting or interacting, and time of season for that sport, whether early, mid, or late season (Munroe et al., 1998) . Result of a study utilizing the SIQ, 10 sports, and 350 varsity athletes indicated that Cognitive Specific (CS) imagery use increased throughout the competitive season, which is typically used to facilitate skill acquistion in the early season, but then seems to be employed in arousal management and focus control. Motivational Specific (MS) imagery use also increased significantly for most sports during the course of the season, with the researchers speculating that the reason for the increase could be due to the fact that MS imagery is used primarily for goal setting, and as the season progresses, those goals probably increase in importance. Cognitive General (CG) imagery use increased during the course of the season as well, which involves rehearsing strategies of play. By sport, team sport athletes reported a greater use of the MS and MG-M forms of imagery than athletes in coacting sports.

Of note are two other variables in imagery use that Munroe et al. (1998) found: the amount of perceived success the team was experiencing, and the type of imagery coaches encouraged athletes to use. Athletes in the middle of a poor season may find it

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difficult to image themselves having successful performances, winning a medal, trophy, etc. Studies (Barr & Hall, 1992; Orlick & Partington, 1988) have found that coaches recognize imagery as an important tool and advocate its use; it is probable that athletes may change their use of imagery over the course of a season based on their coaches instructions.

Imagery summary

The efficacy of imagery in enhancing athletic performance is well established. However, there are at least five identifiable and empirically supported types of imagery, and the type employed for the purpose of performance enhancement may vary by the skill level of the performer, the time of the season, the task the imagery is being applied to, and the type of sport. In this study, all participants were athletes in a coacting sport, and mean years of swimming experience for all participants in the study were eleven. Therefore, the function of the imagery employed in this study was primarily Motivational Specific (MS), with minor cognitive elements to it, as opposed to primarily cognitive and focused on skill acquisition. All the swimmers, while continually refining and adding to their skill base, had sufficient training and experience to have acquired the swimming skills needed to function at a high level of proficiency.

Relaxation

Researchers have demonstrated that relaxation can improve performance when used as a solo intervention (Benson, Dyer, & Hartley, 1978; Cogan & Petrie, 1995; Smith, Gil, Crews, Hopewell, & Morgan, 1995; Ziegler, Klinzing, & Williamson, 1982) .

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However, relaxation combined with imagery is more effective than either one used alone (Cogan & Petrie, 1995; Martin et al., 1999; Cupal & Brewer, 2001). This has been a well-documented and widely accepted result in the sports psychology performance enhancement literature; as a result, relaxation has been an integral part of numerous multi-component interventions in the realm of athletic performance enhancement. Research in this area has examined a diverse group of sports, such as swimming (Page, et al., 1999); running (Smith et al., 1995); triathlon (Patrick & Hrycaiko, 1998); basketball (Lerner et al., 1996); gymnastics (Cogan & Petrie, 1995); kayaking (Millard, et al.2001); deep water running (Brewer et al., 1998); rugby (Jackson & Baker, 2001); soccer (Salmon et al., 1994); and golfing (Beauchamp et al., 1996).

Progressive Muscular Relaxation (PMR)

As early as 1921 Edmund Jacobson described a method to relax the striated muscles in a progressive manner (Jacobson, 1925). Jacobson, who developed psychoneuromuscular theory (see previous section) concluded that the contraction of specific muscles involved in an action that would typically take place following an instruction to imagine that specific action does not occur if at the same time the muscles are completely relaxed (1930) . He operationalized relaxation rather simply (1934) when he said "Relaxation is the direct negative of nervous excitement. It is the absence of nerve-muscle impulse". Elaborating, the absence of nerve-muscle impulse is the absence of tension on a muscular level, and the classical, standard definition of tension is the contraction of striated muscle fibers just as relaxation is their elongation.

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Two ideas were basic to PMR. One is that, simply, subjects can be trained to relax, or, as Jacobson (1934) put it, "relaxation can be cultivated in man". The second basic tenet was that Jacobson found that that the time it took each subject to relax was considerably shortened from the initial sessions (Jacobson, 1934). He viewed PMR as "nervous re-education", and believed that body's muscles respond to thoughts of perceived threats with tension or contraction as a physical manifestation of stress response. Jacobson believed (1934) muscular tension to be the most common symptom of stress, and could typically lead to stiffness, pain, discomfort, misaligned posture and joint instability. These symptoms of muscular stress were due to the fact that muscle tension produced through the stress response is primarily isometric (no visible change in length); muscles contracted isometrically can begin to show signs of shortening over time.

Jacobson felt that in order for PMR and "nervous re-education" to be effective, a learned awareness of tenseness sensations must precede the conscious control of relaxation (1934). This is accomplished by alternately tensing and relaxing groups of muscles in a systematic fashion, progressing from the feet to the head, although practical application of the PMR technique can progress head to toe as well.

Uses of PMR

Jacobson (1934) reported success in using his PMR technique to treat high blood pressure, indigestion, colitis, insomnia, and what he called "nervousness." Benson (1976), building on the work of Jacobson, has investigated relaxation as a means to controlling and reducing stress. He coined the term "Relaxation Response" which he uses to describe the physiological and mental responses that occur when one consciously relaxes: a decrease in the heart rate, metabolism, rate of breathing, blood pressure, and brain wave

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patterns that show significant levels of alpha brain waves. Benson believes the key to stress reduction is inducing the relaxation response, which can lead to conscious control of some autonomic nervous system functions.

Aside from autonomic nervous system regulation, other researchers have reported relaxation to be efficacious in significantly reducing re-injury anxiety, pain, and increasing knee strength post anterior cruciate ligament reconstructive surgery, when used in conjunction with guided imagery (Cupal & Brewer, 2001); treat tension headaches (Blanchard, Nicholson, Taylor, & Steffik, 1991); reduction of generalized anxiety (Russell, Lent, & Sipich, 1977), test anxiety (Kooken & Hayslip, 1984; McGlynn, Kinjo, & Doherty, 1978), and flying phobias (Rebman, 1983).

More specific to this thesis, in the realm of sport psychology researchers have utilized relaxation by itself as a means of improving various physiological measures associated with running, such as running economy (RE), as measured by amount of oxygen consumed at a given submaximal velocity (Smith et al., 1995, N=36); VO2 max (Benson et al., 1978; Ziegler et al., 1982); and arousal management (Cogan & Petrie, 1995; Dewitt, 1980; Murphy & Woolfolk, 1987) . Relaxation has also been used in conjunction with other interventions as an integral part of a multicomponent performance enhancement intervention package in activities as diverse as deep water running (Brewer & Helledy, 1998); kayaking exit skills (Millard, Mahoney, & Wardop, 2001); downhill ski racing (Suinn, 1972); karate competition sparring performance (Weinberg, Seabourne, & Jackson, 1981) and goal kicking in rugby (Jackson & Baker, 2001), among others. Additionally, Hall (1990) effectively sums for the majority of researchers when he states

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that relaxation use, especially in conjunction with imagery, is utilized more frequently in competitive or pressure situations, as opposed to practice or non-competitive situations.

Cue-controlled relaxation (CCR)

In a review of cue-controlled relaxation studies, Grimm (1980) reports that case reports, single group uncontrolled studies, and research including untreated control groups have offered encouraging results as to the effectiveness of CCR in ameliorating anxiety-based problems. The most direct application of CCR in performance enhancement in a sports application would be in pre-performance arousal management; combined with imagery to enhance the quality of that imagery; or as a means of associating a reduced anxiety response with enhanced performance.

The basic assumption underlying CCR is that as a result of the contiguous association between a cue-word and relaxation, the cue-word will come to evoke a relaxation response. In this study, participants were initially trained in PMR to adhere to Jacobson's protocol (1934) that a "learned awareness of tenseness sensations must precede the conscious control of relaxation." The conscious control of relaxation was then paired with two cue words; "relaxed", and "energized", that were used in the ideal swim imagery script recorded on audiotape, and distributed to all participants.

Relaxation Summary

Relaxation has been utilized for many years, and demonstrated efficacy in: reduction of sympathetic nervous system arousal, diminishing muscular tension, and regulation, reduction, or elimination of anxiety, whether generalized or associated with specific situations. Relaxation, as a stand alone intervention, has been used as a means of

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improving various physiological measures associated with running. All these applications transfer readily to performance enhancement applications in sport, and relaxation has been proven to be efficacious in a wide variety of sports, groups, practice and competitive situations, whether used singly or in combination with imagery. Relaxation has also been used in conjunction with other interventions as an integral part of a multicomponent performance enhancement intervention package

Cohesion

Cohesion definitions

The classic definition for group cohesion was advanced by Festinger, Schachter, and Back (1950), who considered cohesiveness to be the resultant of all forces causing members to remain in the group. Gross and Martin (1952) argued that emphasis should be placed on the strength of the relational bonds among group members during periods of crises, thus reconceptualizing cohesion as the resistance of the group to disruptive forces. Lott & Lott (1965) felt that cohesion may be the most important small group variable. Carron (1982) felt that cohesion is best defined as " a dynamic process which is reflected in the tendency for a group to stick together and remain united in the pursuit of its' goals and objectives."

Effects of cohesion

Cohesion has been associated with a number of positive individual and group consequences. In general, with higher levels of cohesiveness, group performance is superior, task and social interactions and communications are enhanced, the group is more stable, and role acceptance and conformity to group norms increase. Individual

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group members experience less anxiety and greater self-esteem; show greater trust, feelings of security, and willingness to change; more readily share responsibility for group outcomes (Carron & Spink, 1993; Prapvessis & Carron, 1996); increased confidence in the group's ability to withstand the negative impact of disruptive events (Brawley, Carron, and Widmeyer 1988); and perceptions of increased acceptance and support from other group members (Yalom, 1975).

In sports specifically, a critical role in the success or failure of teams may be played by team cohesiveness (Widmeyer, 1994; Ziobro & Diziaasko, 1975). Carron (1982) and other researchers (Brawley, Carron, and Widmeyer, 1994; Martens & Peterson, 1971) have speculated that teams whose members are held together by the power of a common goal may, in fact, be more successful than less cohesive teams.

Cohesion and Performance relationship

The pattern of the relationship between cohesion and performance has been the subject of a number of studies (Carron & Ball, 1977; Landers, Wilkinson, Hatfield, & Barber, 1982; Williams and Hacker, 1982). Simply put, the question is "Does performance success contribute to cohesion, or does cohesion contribute to performance success?"

Historical summaries of sport psychology research describe the relationship between cohesiveness and team performance as an inconclusive one. In 1971, Martens and Peterson stated " findings relevant to the relationship between interpersonal attraction and task performance are contradictory." Carron concluded in 1980 that study results

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examining the effects of cohesion on performance have been inconsistent, and in 1986, Gill suggested that inconsistent results were still the norm for research in this area.

Some of the variation in research results may be accounted for by what Mudrack (1989) described as "confusion, inconsistency, and almost inexcusable sloppiness" regarding defining the construct of cohesion, and the concomitant difficulty in measuring, as well as analyzing the construct. Additionally, Brawley, Carron, and Widmeyer (1987) make the point that the use of non-comparable instruments with unknown psychometric properties has made it extremely difficult to determine the relative contribution of cohesion to performance.

Most of the studies conducted have been correlational in design, and defined performance in terms of a team's win/loss record either during or at the end of a season. However, Ruder and Gill (1982) utilized a quasi-experimental design in examining the effects of the outcome of a single game on the cohesion of volleyball teams. Ultimately, their results suggested one performance outcome can result in significant changes in cohesion, and supported the positive causal relationship between team performance and cohesion. It should be noted that volleyball teams are interactive, rather than coactive, in nature.

In their 1994 meta-analysis on the cohesion-performance relationship, Mullen and Cooper (1994) examined 49 studies in various fields in psychology. They noted that the relationship was plausible in either direction. " On the one hand, group cohesiveness could energize and direct group members toward successful task completion. This has

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been the implicit assumption guiding most studies of the cohesiveness-performance effect. On the other hand, excellence in performance should make group members feel much better about the group."

Ultimately, Mullen and Cooper did conclude that while small, the overall cohesion-performance relationship is positive. However, the relationship of performance to cohesion was stronger than that of cohesion to performance. It should be noted that the insights that Mullen and Cooper derived from their meta-analysis may have limited applicability to cohesion-performance issues in sport for several reasons. First, they included 49 studies that drew on a wide variety of groups, such as sports teams, military units, lab groups, and business teams. Secondly, they found no evidence that task type moderates the cohesion-performance relationship for groups in general. This issue was not examined specifically for sport groups, although they did find the highest cohesion-performance relationship in sport teams.

Overall, the typical conclusion by reviewers of sports psychology research has been that the relationship between cohesion and performance is positive in interacting sports and negative in coacting sports (Bird, 1977; Bray & Whaley, 2001; Carron, 1988; Cox, 1990; Gill, 1986); in fact, studies with rifle and bowling teams (McGrath, 1962; Meyers, 1962) found that task focused decreased as the amount of positive social interactions between team members increased. In their study with bowling teams, Landers and Luschen (1974) showed that successful teams had more communication with spectators than with their teammates.

In contrast, a 1991 study by Williams and Widemeyer using the Group Environment Questionnaire (GEQ; Carron, Brawley, & Widmeyer, 1985) to assess

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cohesion in NCAA Division I female athletes in a coacting sport (golf; N=83), a positive relationship between performance and cohesion was found. However, the cross-sectional one time data collection study design only permitted identifying correlations among variables, and not conclusions on cause-effect relationships.

Cogan and Petrie (1995) conducted a controlled comparison of a season-long multi-dimensional sport psychology intervention with collegiate female gymnasts (N= 28) that was designed to reduce competitive state anxiety and increase team cohesion. Their results contrasted those of Williams and Widemeyer. They found that the intervention gymnasts had their best performance while reporting their lowest level of task cohesion, a dimension of the GEQ on which Williams and Widemeyer had found a positive relationship between task cohesion and performance.

Williams and Widemeyer (1991) acknowledge that we still do not know if cohesiveness fosters successful performance, or vice versa. They speculated that their finding of a positive cohesion –performance relationship may have been due to the direct assessment of group task cohesion via the GEQ as opposed to the "essentially indirect, interpersonal attraction measures employed by earlier researchers." Taken as a whole, the prior investigations suggest stronger support for successful performance-improving cohesion relationship than improved cohesion generating successful performance relationship (Widmeyer, Carron, & Brawley, 1993).

Conceptual model of cohesion: The Group Environment Questionnaire (GEQ)

Carron (1982) felt that the previous conceptual treatment of cohesion in the research literature was unidimensional and static. Carron, Brawley, and Widmeyer (1985)

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endeavored to construct a clear conceptual model of cohesion based on their review of the extant literature, and attempted to address what they perceived as the problems in group research (lack of conceptual clarity, inadequate measurement procedures) leading to equivocal results. Two important distinctions that were made- the individual versus the group and task versus social concerns- had a major impact on the development of their model.

Specifically, their conceptual model was divided into two major categories: an individual members perception of the group as a totality and a member's personal attractions to the group. These categories are then further broken down into task and social aspects, yielding four identifiable constructs: group integration-task, group integration- social, individual attractions to group-task, and individual attractions to group-social. Carron et al. assumed that the four constructs were correlated and are related through the perceived interaction of various task and social orientations as viewed through the eyes of the individuals for themselves and their group.

Note that the antecedents and consequences of cohesiveness are not incorporated into the measurement of cohesion, and that cohesion is treated as a multifaceted concept. Additionally, the individual's perceptions of the group task and social cohesiveness are considered through two major perspectives: personal (" what an I doing?") and group ("what is the group doing?").

This conceptual model led to the development of the Group Environment Questionnaire (GEQ) by Carron et al. 1985. This conceptual model for the GEQ and cohesiveness has received a general acceptance in sport psychology, and has been the

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primary instrument used to assess cohesion in sports teams since the mid to late 1980's (Dion & Evans, 1992; Slater & Sewell, 1994).

Thus, the GEQ conceptual model assumes that group members hold two primary types of social cognitions relating to the cohesiveness of the group: (1) the individual's perceptions about the similarity, closeness, and bonding within the group (group integration); and (2) individual perceptions about personal motivations that act to retain them in the group (individual attractions to the group). It also assumes two fundamental orientations for the group member: task and social aspects of group involvement.

Moderators of cohesion effects

Team Sport Type: Interactive vs. Coactive

The cohesion-performance question has been examined in sport using intramural, club, high school, intercollegiate, professional teams and athletes, covering both interactive and coactive sports (Grieve, Whelan, & Meyers, 2000; Iordanaglou, 1993; Martens & Peterson, 1971; Matheson & Mathes, 1997).

Interactive sports (i.e. football, basketball, baseball, soccer) require the combined efforts of all members, applying specialized skills, to achieve group goals (Bird, 1977). Thus, in interactive sports, the idea is simply that interdependence contributes to performance success, and individual goals are suppressed for the sake of team goals (Bird, 1977, Caron, 1982). In contrast, coactive sports (i.e. swimming, gymnastics, golf), players independently perform the same skills, and those performances are then summed to produce a team achievement and overall score. Not only are task interactions not required (Carron & Chelladurai, 1981); researchers have suggested

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(Landers & Luschen, 1974) that athletes use intrateam rivalry and competition as motivating factors, thus emphasizing individual goals, rather than suppressing individual goals for the sake of team goals in coacting sports. Carron (1988) explains that in the setting of a coacting team environment, becoming overly concerned with the feeling and welfare of teammates may detract from one's own performances. However, Matheson et al. (1995) have suggested that this idea may have to be reexamined in its applicability to women's teams.

In a study utilizing the GEQ that compared levels of cohesion across time (pre-season, mid-season, and post-season) and type of sport (coacting: i.e.,gymnastics, swimming; vs. interacting: i.e., lacrosse, basketball), Matheson, Mathes, and Murray (1995) found that coacting teams displayed significantly greater changes in cohesion than interacting teams, specifically on the Attraction to Group-Task subscale at the mid-season mark. Subjects were 48 NCAA Division III female athletes. Overall, however, no significant main effect differences were found between coacting and interacting teams on the cohesion subscales.

Another study that used a quasi-experimental design was conducted by Kozub and Burton (2000). They gave the GEQ to sixty male rugby players, and sixty male swimmers, thus comparing interactive and coactive teams. The GEQ was administered pre and post competition to study the relationship of team performance to cohesion. Their findings generally supported their hypothesis that the outcome of the competition would have "more of an influence on the cohesion perceptions of rugby players than swimmers" (i.e., more of an influence on interactive sport participants than coactive sport participants).

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Gender

Gender has been found to be a moderator variable for group dynamics in previous studies in the area of productivity (Wood, 1987); orientation toward competition vs. cooperation (Duda, 1987); and leadership (Eagly & Johnson, 1990).

In terms of the extent to which cohesion is associated with performance success, there is no empirical, or theoretical support for predicting that male or female teams differ (Widmeyer & Martens, 1978). However, male interacting teams have been the primary focus of research on cohesion (Williams & Widmeyer, 1991).

An anecdotal example from the U.S. women's Olympic volleyball team in 1996 seems reflective of a common perception among coaches and athletes, here illustrated by a team member's comment after the team failed to perform as expected: "with women's sports especially, so much is based on emotion and how the team is feeling" (Wahl, Wertheim, & Dorman, 2001). In 1982 Gilligan (as cited in Matheson, Mathes, & Murray, 1995) had theorized that the nature of competition presented more problems for women than men in that women value friendships more than the game or outcome of the task. She observed that when rule disputes arose, females were more likely to abandon the game rather than risk friendships, whereas males were more likely to resolve disputes and continue the game, learning to cooperate with enemies and compete with friends. Nelson (1991) has suggested that women are more attracted to partnership models of competition, supporting teammates efforts at task mastery, rather than trying to beat a rival, even in independent sport tasks. This may be a moderator variable between male and female athletes, in that females may place greater importance on the social versus task dimension of the team (Matheson & Mathes, 1997).

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Winning and Losing

The effect of cohesion on performance has been measured most frequently by two means: by using win/loss record as a measure of absolute performance, during the season (Boone, Beitel, & Kuhlman, 1997; Matheson & Mathes, 1997) and at the end of the season (Evans, 1980; Matheson & Mathes, 1997; Ruder & Gill, 1982). The rationale is simply that individual perceptions of group cohesion will vary as changes occur in areas of importance to the group throughout the season. As winning and losing are areas of importance, the outcome of competitive events has the potential to greatly influence perceptions of team cohesion (Kozub & Button, 2000).

Cohesion Summary

Cohesiveness has been simply defined to be the resultant of all forces causing members to remain in the group. Generally, higher levels of cohesiveness lead to superior group performance. Additionally, communications as well as task and social interactions are enhanced, the group is more stable, and role acceptance and conformity to group norms increase.

Research has suggested that there is stronger support for the performance-cohesion relationship than the cohesion performance relationship; however, the overall cohesion-performance relationship is positive, albeit small. In terms of the type of sport, research indicates that the outcome of competition would have more of an influence on interactive sport participants than coactive sport participants. Considering possible gender differences, there is currently no empirical, or theoretical support for predicting that male or female teams differ in terms of the extent to which cohesion is associated with

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performance success. However, females may place greater importance on the social versus task dimension of the team; this may be a moderator variable between male and female athletes, leading some researchers to speculate that women are more attracted to partnership models of competition, supporting teammates efforts at task mastery, rather than trying to beat a rival, even in independent sport tasks.

Nomothetic Vs. Idiographic

Research literature strongly suggests that no particular treatment works for everyone. Treatment effects can be moderated by a number of factors, such as interpersonal resistance, commitment to the intervention being attempted, and dimensions of patient response (Kerr, 1993). Thus, few would argue with the commonsense idea that treatment should be individualized to the needs and characteristics of clients (Miller, 1989). Yet sport psychology interventions are typically offered to clients in package form, based on the researcher's (or practitioner's) theoretical orientation, or personal preference, in spite of numerous authors calling for more idiographic research and practice (Balague, 1999; Kerr, 1993; Giges & Pettipas, 2000; Lines, Schwartzman, Tkachuk, & Martin, 2000; Weinberg & Comar, 1994; Orlick, 1989). The call for idiographic approaches stems from the recognition of individual differences by researchers (Beutler & Hartwood, 2000).

One of the most critical factors affecting the efficacy of any therapeutic intervention is the commitment of the client to the intervention (Miller, 1987). This is especially important considering that a survey of Belgian sport psychology professionals revealed that only 21% of the consultations were actually initiated by the athletes

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themselves (Wylleman, et al. 1999). While athletes are generally willing to participate in performance enhancing intervention, by involving the athlete in the decision making process, their motivation to implement and adhere to the mental training regimen is likely to be high (Miller, 1987; Jones, 1993).

In a typical process of delivering psychological skills training, the athlete plays a relatively passive role in the process of deciding which techniques to learn (Jones, 1993). Ideally, the stages of the consultation process would consist of the athlete and sport psychologist negotiating aims and objectives; the sport psychologist undertaking an analysis of the requirements of the sport; the sport psychologist carrying out an assessment of the athlete using interviews and various questionnaires and instruments; the sport psychologist implementing some form of psychoeducation; the sport psychologist training the athlete in the relevant techniques and skills; and success of the program being evaluated (Butler & Hardy, 1992). The intervention rationale should be coherent, logical, theoretically and empirically well-grounded (Adelman, 1986, as cited in Cogan & Petrie, 1995).

One approach that has been used in a successful idiographic intervention is performance profiling. Jones (1993) cites a successful cognitive behavioral intervention with an elite female racket sport player, who sought help due to problems with her temperament on the court. The athlete described problems with concentration in competitive situations that took two forms: being distracted by what she perceived as "bad decisions" by the officials, and tending to "panic under pressure" when games were close, thus losing to opponents with less ability.

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The intervention followed the basic procedures involved in performance profiling: (1) the athletes' identification of constructs that they perceive to constitute the qualities of elite performance; (2) the individual athletes' own assessment of their current status along each of these constructs (Butler & Hardy, 1992). This approach, combined with the sport psychologist establishing a feeling of empathy and mutual trust with the athlete (Kerr, 1993), helps to maximize the motivation of the athlete to implement and adhere to the interventions.

The subject identified 25 physical constructs, and 21 constructs that related to psychological, attitudinal, and communication qualities. Based on this performance profile, a cognitive behavioral intervention combined with a relaxation component was chosen, and a detailed rationale was provided to the client. The intervention took place in 4 phases, with three and six month follow-ups. The subject was totally committed to the training program in all phases, and she attributed her motivation to the initial performance profiling process (Jones, 1993). Shortly after the six month assessment, the client won the major championship in her sport for the first time in her career. In both private and media remarks, she attributed this success to her training in relaxation.

A case study by Collins, Morriss, and Trower (1999) using an interdisciplinary team approach describes the design, execution, and evaluation of an intervention to aid the recovery of optimum techniques in an elite javelin thrower. The services of a biomechanist were utilized to assist in movement analysis, and helped to provide a foundation for the design and focus of the intervention. In consultation with the athlete and coach, the sport psychologist interacted closely to design the drills the regimen in which they were used, and the incorporation of said drills into the athlete's program.

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The actual intervention was multi-component in nature, using behaviorally based techniques, visual imagery, and audiotape prompting. The biomechanical evaluation provided a control for the study, as the objective was to have the client return to medal winning form exhibited in the 1996 Olympics. The biomechanical analysis revealed that, in fact, the athlete's form became superior to that of 1996. A check of the athlete's training diaries and consultation with the coach revealed that the amount of technical work done in practice by the athlete had not changed. The only change was that of the specific sport psychology input to the training drills.

A third example of an idiographic intervention involved a female collegiate basketball player on a top-ten ranked NCAA Division I team (Savoy, 1993). The intervention developed for the athlete was multi-component in nature, incorporating imagery, centering, focusing, energizing, and arousal evaluation and control. Subsequent evaluations of the athlete indicated a decrease in precompetition anxiety, improvement in game performance statistics, practice performance, and the coach's evaluation of the athlete.

The characteristics of the idiographic interventions described above are similar: a thorough assessment, consultation with the athlete and coach, collaboration in the choice of goals between consultant, athlete, and support staff, regular contact and communication between the sports psychology consultant and the athlete. In all three cases cited, the athletes and associated support staff reported themselves pleased with the results. While no statistical measures of significance to determine efficacy were available, improved athletic performance was an acceptable measure of effectiveness to the athletes involved.

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In contrast to the single subject studies reported above, this study will attempt to incorporate idiographic techniques to a team setting by soliciting individual athlete input in the designing of the mental preparation statements to be used by each athlete. The hopeful result will be a set of mental preparation statements unique to each athlete, and one more congruent to their individual athletic needs.

Hypotheses

Based on the literature review, the following hypotheses are made for the current study:

I There will be a meaningful increase in Group Cohesion, as evidenced by an increase in mean scores on the GEQ after the cohesion intervention in both the NCAA swimmers and the Youth Club swimmers.

II There will not be a meaningful change in mean performance times after the cohesion intervention in either group.

III There will be no relationship between improved group cohesion, as measured by an increase in mean scores on the GEQ, and improved mean performance times in either group.

IV There will be a meaningful improvement in performance times as evidenced by a meaningful reduction in mean swim time after the multi-component intervention in both groups.

V There will be a meaningful improvement in group cohesion, as measured by higher mean GEQ scores, after the multi-component intervention, compared to mean GEQ scores after the cohesion intervention in both groups.

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VI There will be similar patterns of performance between groups across time on changes in scores for the GEQ and swim performance times.

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CHAPTER 3

METHODS

Participants

The participants included 38 NCAA Division I swimmers who were enrolled in a university in the Southwestern United States. Fifty-eight percent (22) were female, and NCAA participants mean age was 19.8 (sd = 1.37). Ninety-two percent of the participants were Caucasian, 2.6 were Asian, and 5.3 Hispanic. Freshman constituted 26.3 % of NCAA participants, sophomores 23.7 %, juniors 26.3 %, and seniors 23.7 %. Mean years in swimming at the time of the study was 11.75 (sd = 3.27) for males and 11.14 (sd = 3.410) for females.

Additionally, 12 members of a Youth Club swim team affiliated with the same southwestern university participated. Fifty-eight percent (7) were female, and Club participants mean age was 16.58 (sd= .99). Seventy-five percent of the participants were Caucasian, 8.3 African American, and 16.7 Hispanic. College freshman constituted 8.3 % of age group participants, high school sophomores 8.3 %, juniors 41.7 %, and seniors 41.7 %. Mean years in swimming at the time of the study was 10.25 (sd = 4.34) for the males and 10.85 (sd = 3.34) for the females.

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Setting

All swimming trials took place at an NCAA sanctioned swimming pool. The trial swims took place in a 25 meter long x 60 feet wide pool, with the swimmers completing two 25 meter laps for each of the 10 x 50 meter repetitions.

For the Cohesion intervention, all participants met at the Natatorium building, which houses the swimming pool as well as spectator bleachers and observation areas. All three cohesion sessions took place in the spectator bleachers located immediately above the swimming pool.

For the Multi-component Mental Skills Intervention (MCMST), all participants met as a group in a large room that was part of the pool complex. The floor of the room was covered with foam tumbling mats, so each participant could recline comfortably on the floor. All three MCMST sessions were held in the same room.

Experimental design

In this study, a multiple baseline design across teams design was used to assess outcome (Kazdin, 1998). A primary concern was controlling for the extraneous variable of swimming conditioning acquired during the course of the study, as measures of swimming performance were to be collected multiple times during the course of the study. Thus, it was reasonable to consider that an improvement in swimming performance might occur simply due to a swimming conditioning effect, rather than experimental intervention. Therefore, as indicated by Kazdin (1998), in the multiple baseline design, introduction of the intervention is staggered across the participants to control for the influence of extraneous variables (in this case, a training effect). The

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demonstration of repeated performance changes in response to the intervention introduction should discredit potential extraneous variable influence.

Specifically, measures of swimming performance would be taken three times over the course of approximately nine weeks for the NCAA swimmers. The first to establish a baseline, the second following three weeks of the cohesion intervention, and the third following three weeks of the MCMST intervention. For Youth Club swimmers, measures of swimming performance would be taken four times over the course of approximately twelve weeks. The first to establish a baseline, the second following three weeks of swim training without any intervention to establish a second baseline, thus deriving an estimation of the training effect for comparison across and within groups; the third following three weeks of the cohesion intervention, and the fourth following three weeks of the MCMST intervention. This permitted the NCAA swimmers to receive the cohesion intervention while the Youth Club swimmers were still conducting pre-intervention baseline trials. If the intervention is effective, then changes would be expected in the NCAA team consequent to intervention, while performance of youth swimmers during baseline should remain the same, or increase less, with any increase attributable to the training effect. If this is indeed the case, than effectiveness of the intervention is supported. To test these results further, the intervention is then applied to the second group, and if the performance of the 2nd group changes in the positive direction at this time, than further support for the intervention is provided (Scott, et al, 1999).

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Dependent Variables

The dependent variables were (1) mean elapsed time in a swimming test set of 10 repetitions of a 50 meter swim, performed individually, producing individual, gender, and team mean performance times; (2) Mean GEQ scores, by individual, gender, and team.

Measures

Swimming Performance

The current study used a swimming "test set" to measure performance. A test set was defined as 10 repetitions of a 50 meter swim, performed on a time interval of 90 seconds (i.e., the swimmer had 90 seconds to complete the interval. If the swimmer completes the 50 meter swim in less time, then the swimmer is able to rest for the remainder of the interval).

Three test sets were conducted for the NCAA swimmers, four for the Youth Club swimmers, and test sets were scheduled three weeks apart for both groups. The order of the test sets was as follows: Baseline 1 (for both groups), Baseline 2 (Youth Club swimmers only), Post-cohesion intervention test set (for both groups), and Post-MCMST intervention test set (for both groups). Swimmers were instructed to choose one particular stroke to swim throughout all test sets.

Swimming performance was measured by obtaining the mean elapsed time for ten repetitions of a fifty-meter test set swim. Swimmers performed test sets one to a lane. The times were measured by the head or assistant swim coaches using a hand-held stopwatch, and recorded by an assistant coach. Times were measured to 1/100 of a second. Due to a seasonal shift in training patterns for both the NCAA swimmers and the Youth Club

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swimmers, the final swimming test set was swum by completing two 25 yard laps, instead of the original two 25 meter laps, for a swimming test set of 10 x 50 yard repetitions. To accommodate discrepancies between these test sets, yard times were converted to meter equivalents using the standardized "Short-course conversion" formula supplied by the NCAA (2001): yards time in seconds / .896 = meters time.

The Group Environment Questionnaire (GEQ)

The GEQ contains 18 items measured on a Likert- type scale ranging from 1 (strongly disagree) to 9 (strongly agree). There are four separate scales contained within the GEQ: Individual Attraction to Group-Social (ATG-S); Individual Attraction to Group- Task (ATG-T); Group Integration-Social (GI-S); Group Integration-Task (GI-T). ATG measures the individual team members' perceptions and feelings about personal involvement with the group's task and goals. ATG-S measures their social involvement within the group. GI-T and GI-S are measures of the individual team members' perceptions about the team's similarity and bonding regarding the group's task and the group's closeness as a social unit.

The GEQ has demonstrated good validity and internal consistency (Carron et al., 1985; Brawley et al., 1987; Widmeyer, Brawley & Carron, 1985).

Consumer Satisfaction

A two-part Consumer Satisfaction Questionnaire (CSQ) was utilized. Part I (CSQI) consisted of seven questions that asked participants to rate the various components of the intervention as to their helpfulness on a five point Likert scale, with (1) = didn't help at all; to (5) = Extremely helpful. The seven questions were: (1) How much did this program help you to improve your swim performance? ; (2) How much did

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the cohesion exercises help to improve your swim performance? ; (3) How much did the relaxation and Imagery exercises with the motivational and technical statements help you to improve your swim performance?; (4) How much did the cohesion exercises help to bring you closer to your teammates? ; (5) How much did the cohesion exercises help to bring the team closer together?; (6) How much did the relaxation and imagery help you to improve your swim performance?; (7) How much did the motivation and technical statements help you to improve your swim performance?

Part II (CSQII) asked participants to rank order four statements in terms of how much they helped to improve their swim performance with 1 = first place, and 4= last place. The statements were: "The cohesion groups helped to improve my performance"; "The Imagery and Cohesion groups improved my performance"; "The cohesion groups improved my relationship with my teammates"; "The motivational and technical statements helped me to improve my performance".

Demographics Questionnaire

A brief demographics questionnaire was devised and administered to each participant (e.g., age, class standing, ethnicity, gender, and years swimming).

Treatment Integrity

Several strategies were employed to ensure the integrity of treatment (Yeaton & Sechrest,1981): (1) Research assistants (R.A.'s) used a detailed script specifically designed for each session, indicating the materials needed, tasks to be completed, the order in which those tasks needed to be completed, and homework assignments for the participants; (2) Monitoring by one or more team members of protocol adherence by group leaders, using a prompting checklist; (3) protocol adherence checklists for

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homework assigned to the subjects during the multi-component sessions of the intervention were utilized; (4) ongoing supervision of the research assistants involving task adherence, problem solving, and corrective feedback to the R.A.'s.

Prompting lists were used throughout the study to obtain reliability and validity estimates. Specifically, during the cohesion intervention, each therapist indicated whether of not they had implemented each therapy task by marking the appropriate box on the prompting list. The independent rater, who had been trained in the intervention procedures, unobtrusively observed the group process and then utilized the same prompting list to evaluate whether the group leader had implemented the assigned intervention tasks. During the multi-component intervention, the scripted portion of the intervention involved utilizing an adapted Progressive Muscular Relaxation script, or a "perfect swim " script. This portion of the intervention was administered by the lead research assistant, and was monitored by the other five research assistants, following line-by-line on their own copy of the script, marking with a check each line as it was delivered. The lead research assistant then followed a similar procedure, indicating on the script whether he had implemented each line of the therapy script. Throughout the study, the reliability estimate was based on both the therapist and rater lists, and was calculated by dividing the number of tasks both the therapist and rater indicated as completed by the number of tasks possible. The validity estimate was based only upon the therapist list and was calculated by dividing the number of tasks completed by the total number of possible tasks.

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Treatment adherence

Two protocol adherence checklists for homework assigned to the subjects during the multi-component sessions of the intervention were utilized. The first participant protocol adherence checklist was utilized after the Progressive Muscular Relaxation section of the multi-component intervention, and was designed to track participant compliance with assigned homework, i.e. daily listening to the PMR audiotape, time of day the tape was listened to, and the quality of the relaxation achieved. The latter was rated on a 5 –point Likert scale, 1= poor quality of relaxation, not at all relaxed or energized, 5= high quality, very relaxed and/or energized.

The second Protocol Compliance checklist was employed during the Imagery sessions of the multi-component intervention. This included the three categories from the previous checklist (daily listening to the relaxation/imagery audiotape, time of day the tape was listened to, and the quality of the relaxation achieved) as well as two other categories that related to the incorporation of the imagery and mental preparation section of the multi-component intervention. Those two additional categories were: (1) Review card each day/how many times per day; and (2) quality of imagery, which was on a 5 point Likert scale, 1= poor quality or no images at all, 5= clear imagery, very detailed.

Procedures

Initial contact was made with the head coach of the NCAA Division I swim team four months prior to the actual start of the study. A proposal was submitted to the coach outlining the experimental questions being posed, as well as the potential risks and benefits to the athletes and team. Over the course of the next four months, seven meetings

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took place with the head and an assistant coach, during which the proposal was modified at the request of the head coach to accommodate scheduling needs, comfort level with procedures involved, team time available for interventions, and experimental integrity. Additionally, coaches gave input essential to the inclusion of the appropriate technical and motivational statements in the development of the technical and motivational statement questionnaires (see Measures section below).

The head coach of the Youth Club swim team was initially invited to determine if she would be interested in having her team participate in the study. There were two subsequent meetings after protocol development was complete to confirm protocol approval and arrange scheduling. After permission was acquired and protocol development was complete, the completed protocols, informed consents, and instruments to be used in the study were submitted to the University's Internal Review Board (IRB) for approval. Prior to beginning any work involving human subjects. Approval from the Institutional Review Board at the University of Nevada Las Vegas was obtained on October 8, 2001.

After the necessary IRB approvals were obtained, the NCAA Division I athletes met as a group with the author of the study in the second week of the season. At this meeting, the study was explained to them, questions were answered, and consent forms were signed. Additionally, the demographic forms were completed, and baseline scores on the Group Environment Questionnaire and the Sports Imagery Questionnaire were obtained.

The Youth Club swim team athletes also met as a group with the author of the study. The same format was followed as with the NCAA swim team, except that as the

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majority of the club swimmers were under the legal age of consent, parental informed consent forms were obtained from parents/guardians. Additionally, minor informed assent forms were given to the underage swimmers for their review and signature.

For the NCAA participants, the next step after initial form completion was establishment of baseline swim performance times by completing the first swimming test set. There was a one week interval between completion of the first swimming test set and initiation of the cohesion intervention (see intervention section below). During the cohesion intervention NCAA participants met once each week for approximately 45 minutes, for three consecutive weeks. Prior to initiation of the cohesion intervention, the NCAA participants were randomly assigned to one of five groups. Assignment was made by putting all the names of participants on slips of paper, then putting them into one of two hats, separated by gender. Names were then randomly removed from the hat, alternating by gender, until all participants had been assigned to groups. Four of the groups had eight participants; one had nine. Participants remained in the same groups throughout all three cohesion intervention sessions. One week after completion of the cohesion intervention, the second swimming test set took place for the NCAA participants following the same procedures established for the first test set. Swimmers also completed the GEQ for the second time. Two days after the completion of the second test set, the MCMST intervention began. All three meetings of the MCMST occurred in a group meeting room, with the NCAA team meeting as one group. The group meeting room floor was covered with foam padding, so participants could sit comfortably while participating in the MCMST intervention. The three sessions of the MCMST were each approximately 45 minutes long. One week after the completion of the

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MCMST intervention, the third iteration of the swimming test set took place, following the same procedures utilized for the prior test sets. Due to scheduling conflicts, the 3rd iteration of the GEQ and the consumer satisfaction questionnaires were completed one week after the swimming test set, rather than the same day as the test set. The total duration of the intervention period, including the swimming test sets, was 9 weeks.

The experimental procedures the Youth Club swimmers followed were similar to those the NCAA swimmers, with several important differences. After the initial assessment, the first swimming test set took place on the same day that the NCAA swimmers completed the first baseline test trial, and was subsequently followed three weeks later by a second baseline trial, the second test set for the Youth Club participants. During the three week separation between the first two test sets, the NCAA swimmers received the cohesion intervention, while the Youth Club swimmers received no intervention. Thus, Youth Club swimmers completed four test sets, compared to the NCAA swimmers three test sets.

Youth Club swimmers were then administered the same cohesion intervention the NCAA participant received, with one exception. Since there were only twelve Youth Club swimmers, there was only one group for all the sessions of the cohesion intervention, in contrast to the five groups needed for the NCAA participants.

One week after completion of the cohesion intervention, the third swimming test set took place for the Youth Club participants following the same procedures established for the NCAA swimmers test sets. Swimmers also completed the GEQ for the second time. Two days after the completion of the third test set, the MCMST intervention began. All three meetings of the MCMST took place in the same group meeting room utilized for

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the NCAA participants, with the Youth Club team meeting as one group. The MCMST intervention followed the same protocol as was utilized with the NCAA swimmers. One week after the completion of the MCMST intervention, the fourth iteration of the swimming test set took place, following the same procedures utilized for the prior test sets. The 3rd administration of the GEQ and the consumer satisfaction questionnaires were completed one week after the swimming test set, rather than the same day as the test set, as had the NCAA swimmers. Total duration of the intervention period, including the swimming test sets, was 12 weeks.

Research assistants

There were six research assistants (R.A.'s) administering the interventions for this study. Three were graduate students in a department of clinical psychology, and three were honors level undergraduate students. The training in the interventions included modeling and role-playing, with individual as well as group corrective feedback. R.A. supervision consisted of on site monitoring by the sixth team member who reviewed R.A. protocol adherence by using a prompting checklist; post-session team discussions, and weekly meetings in which intervention issues were discussed.

Interventions

All participants were administered two interventions. In the cohesion intervention, participants were involved in discussion and exercises relating to team cohesion (i.e., trust exercises, statements of what they like about each other; self and other perceptions of roles on the team, individual characteristics viewed as desirable by the team). The

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second was a Multi-Component Mental Skills Training (MCMST) intervention, consisting of listening to audiotapes with Progressive Muscular Relaxation, mental preparation, and an Imagery component on them. Participants also received personalized laminated 4x6 cards with a combination of motivational and technical statements on them. Each intervention lasted three weeks.

Cohesion Intervention

During Session I, the idea of Positive Expectations was introduced. In the first of four sections, participants were asked to list their heroes, people they admire in sports, or other examples from their lives. In the next section, participants were asked what are the qualities that they see in these people, the qualities that make them heroes. In the third section, they were asked to try and describe an ideal teammate in regards to the above mentioned qualities. Lastly, participants were asked what qualities their heroes and ideal teammates have in common.

For Session II, the focus was on Reciprocity Awareness, with four distinct sections. The first secion began with a brief review of 1st session, emphasizing heroic qualities of teammates. In the second section, each participant was given a sheet of paper, and was instructed to list the names of their fellow group members, and briefly list qualities that they love, admire, or respect in them now, and their expectations of them in practice and competition. Next, in the third section, going one at a time, each participant had to tell each person in the group what they had written about them. As part of this section, the participant had to ask the receiver how it felt, and/or what they liked about it. Lastly, participants were assigned homework designed to extend the small in group experience to the larger team environment. The assignment was for all participants to

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give at least two teammates they knew well, and two teammates they didn't know well, a sincere, realistic compliment based on their appreciation of the above listed qualities in them over the next few days of practice.

Session III emphasized compliments, roles, and expectations. Each group was initiated by going around a circle and discussing compliments they had given or received over the last few days. Then, each person was administered a sheet of paper, and instructed to record their own individual roles and expectations for themselves on ½ of the paper, and their expectations for the team and the role they play in achieving those expectations on the other half. Thirdly, alternating participants read their roles, goals and expectations, and group members discussed the goals that people seem to have in common for themselves and the team. Finally, all three sessions of the cohesion intervention were tied together by the introduction, and discussion of the idea of synergy (i.e, the whole exceeding the sum of the parts).

Multi-component Mental Skills Training Intervention Detail (MCMST)

The focus of Session I was relaxation training, using the technique of Progressive Muscular Relaxation (PMR). The technique of PMR consists of alternately contracting and relaxing muscles in a progression from the head to the toes, following the protocol established by Jacobson (1934). The contrast between tension (contraction) and non-tension (relaxation of the muscular contraction) produces the learned awareness of tenseness sensations that must precede the conscious control of relaxation. Cue words (i.e., "relaxed"; "energized") were introduced that are associated with a relaxed state. This will assist the swimmer in inducing a rapid state of relaxation in the future sessions or in a competition by utilizing recall of the cue words.

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During Session II, the focus shifted from PMR, alternating tension with relaxation, to relaxation training without tension. Specifically, relaxation was induced without utilizing the head to toe progression of contracting and relaxing the muscles, and instead focused on relaxation of the muscles without the contrasting muscular tension. The cue words introduced in session 1 were utilized to assist with the induction of the relaxed state, and were paired with a feeling of being "energized."

In Session III, Relaxation without tension was continued; motivational and technical cue words were utilized, and cues for the "perfect swim" were introduced. Relaxation was induced utilizing the cue words from sessions 1 & 2. Cue words were paired once again with the feeling of being "relaxed and energized," In this session, the cue words associated with the experience of the "perfect swim" were introduced, and they were instructed to imagine cue words (e.g., relaxation, energy, water) in the context of performing the "perfect swim."

All participants in the MCMST intervention received two audio-cassette tapes to utilize at home to increase the likelihood of intervention generalizability. The first one, corresponding with Session I, was a Progressive Muscular Relaxation tape approximately eighteen minutes in length, and followed the PMR protocol cited by Edmunson (1934).

The second tape corresponded with Sessions II & III, and was between 14-15 minutes in length, with approximately 7 minutes of relaxation followed by 7 minutes of imagery. Imagery was developed in consultation with the NCAA and youth club swim coaches in order to develop a swimming script that pertains to an idealized version of a race swim of indeterminate length. The tape contained statements that are consistent with technical aspects of swimming (e.g. "stretch and rotate"), that would be a focus in a

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competitive swim as well as statements (e.g., "you're going to dominate") that are consistent with motivation. The list of motivational and technical statements used in the audiotape were obtained by brainstorming with the coaching staff in three separate session during meetings held in the three months prior to intervention initiation.

The tape was constructed using percent descriptions (i.e., " ...you're 25% done with your swim, and you are feeling completely in control...") so that the imagery would apply equally well to short as well as long distance swimmers. The imagery was organized into a brief pre-swim scene (about 3 minutes), about 6-7 minutes of swim specific imagery, then a brief post-swim scene (2-3 mins.).

Each participant also received a personalized card with technical and motivational statements written in alternating order (Technical/Motivational). The statements printed on each participants card were obtained by instructing each participant to evaluate a list of approximately 30 technical and 30 motivational statements that were also compiled by brainstorming with the coaching staff as described above. The swimmers then rated each statement on 5-point Likert scale (1= not at all useful to me; 5= very useful to me). A mean was derived for each statement, and the highest rated motivational and technical statements for each participant were then listed on a second rating form, with the rating procedure then being repeated. Swimmers were given the chance to their own favorite motivational and/or technical statements on each rating form. After the second rating form was evaluated, the top rated motivational /technical statements for each swimmer were then printed on cards, with front and backside of the card containing the same information, and cards were laminated with plastic so they could be handled while the

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swimmer was wet and remain intact. The cards were read prior to swimming, and during the workout.

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CHAPTER 4

RESULTS

Reliability Evaluations

Interobserver reliability scores ≥ 80 % are generally considered acceptable (Kazdin, 1998). This present study utilized prompting lists to obtain reliability and validity estimates. In the case of the cohesion intervention each therapist checked the appropriate box when the specified protocol task was completed, and a trained independent rater, who unobtrusively observed the group process, utilized the same prompting list and evaluated whether the group leader had implemented the assigned intervention tasks. The MCMST intervention was administered by the lead research assistant, and protocol administration was monitored by two trained independent raters utilizing prompting lists similar to those used for monitoring the cohesion intervention.

Interobserver rates were above 98% for both the cohesion and MCMST interventions, thus exceeding acceptable confidence levels for protocol adherence during the administration of the experimental interventions.

Intervention Effects

Means for elapsed time in the swimming performance test sets, as well as the time differentials between baseline, cohesion intervention, and MCMST intervention

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are shown in Table 1 (see page 75). Data is categorized by swim team and gender. The category labeled "Time diff. Base/Coh." represents the difference in time between swim test measurements taken at the baseline and following the cohesion intervention. In all cases measuring swimming performance, the differential is a negative number, which is indicative of enhanced performance in swimming.

Means for GEQ scores, as well as the differentials between means taken at baseline, post-cohesion intervention, and post-MCMST intervention are shown in Table 2 (see page 75). Again, data is categorized by swim team and gender. Similar to Table 1, the category labeled "Score diff. Base/Coh." represents the difference in mean GEQ scores between mean GEQ measurements taken at the baseline and following the cohesion intervention. In all cases measuring mean GEQ scores, the differential is a positive number, which is indicative of increased cohesion.

Figure 1 (see page 77) compares NCAA male swim performance times with female NCAA swim performance times. Unexpectedly, males displayed enhanced swimming performance post-cohesion intervention (mean = -.46 sec.) as well as post-MCMST intervention (mean = -.36sec.), while females displayed almost no change in their performance across Cohesion (mean = -.03 sec.) and MCMCT (mean = -.03 sec.) measurements; essentially, NCAA females displayed almost no change in swimming performance consequent to either intervention. Additionally, when comparing the results of swim performance times derived post-cohesion intervention for the NCAA males with those times obtained at the Baseline 2, for the Youth club males, the figure illustrates enhanced performance for the NCAA male swimmers. This indicates a strong possibility of an unexpected immediate cohesion intervention effect with regard to performance

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Table 1. Mean times and standard deviations for swimming test sets by group and gender, with differentials calculated post-intervention to illustrate the changes in swimming performance between baseline and subsequent interventions.

NCAA Swimmers	N 25	Baseline	Post-Coh. Inter.	Improvement Base/Coh	Post-MCMST Intervention	Improvement Coh/MCMST		
Male	11	32.78 (3.51)	32.32 (3.48)	-.46	31.96 (3.48)	-.36		
Female	14	34.33 (4.73)	34.30 (4.61)	-.03	34.27 (4.47)	-.03		
Youth Club Swimmers	N 8	Baseline 1 (SD)	Baseline 2 (SD)	Improvement B1/B2	Post-Cohesion Intervention (SD)	Improvement Base2/Coh	Post-MCMST Intervention (SD)	Improvement Coh/MCMST
Male	3	37.40 (8.63)	37.27 (8.18)	-.13	36.38 (7.70)	-.89	35.82 (7.54)	-.56
Female	5	34.56 (2.13)	34.43 (2.66)	-.13	34.15 (2.49)	-.28	33.74 (1.91)	-.41

Table 2. Mean GEQ scores and standard deviations by group and gender, with post-intervention differentials calculated to illustrate the change in mean GEQ scores between baseline and subsequent interventions.

NCAA Swimmers	N 37	Baseline	Post-Cohesion intervention	Score diff. Base/Coh	Post-MCMST Intervention	Score diff. Coh/MCMST
Male	16	4.28(.79)	4.38(.58)	+.10	4.28	-.10
Female	21	4.10(.69)	4.24(.70)	+.14	4.22	-.02
Youth Club Swimmers	N 12	Baseline	Post-Cohesion intervention	Score diff. B1/B2	Post-MCMST Intervention	Score diff. Coh/ MCMST
Male	5	3.45(.79)	3.74(.42)	+.29	2.70(.42)	-.14
Female	7	4.02(.84)	3.85(.57)	-.17	3.97(.72)	+.12

improvement for male NCAA swimmers. This improved performance is possibly beyond that to be expected as a result of a training effect, and is continued in the post-MCMST assessment as expected. However, the improved performance may not be directly attributable to the MCMST intervention (i.e., the experimental methodology does not control for the effects of MCMST); and the amount of improved performance cannot be precisely known due to the inability to control the effect of training experimentally.

Figure 2 (see page 77) compares Youth Club male swim performance times with female Youth Club swim performance times. Both male and female Youth Club swimmers recorded the same time differential (mean = -.13 secs.) between the two baseline trials, and demonstrated a modest improvement in swimming performance, possibly due to the effects of training. Both males (mean = -.89) and females (mean = -.28) display enhanced swimming performance post-cohesion intervention that may exceed the effects of training, thus indicating a strong possibility of an unexpected immediate intervention effect with regard to performance improvement, similar to the NCAA men. Post-MCMST intervention, swim trial performance appeared to improve (-.56 for males, -.41 for females differential between cohesion and MCMST interventions) beyond that expected, based on performance improvements demonstrated during the baseline possibly attributable to the effects of training. However, definitive conclusions regarding the effectiveness of the MCMST intervention, as with NCAA male swimmers, are not possible given the study design limitations.

Figure 3 (see page 78) displays NCAA males and females as well as Youth Club males and females mean GEQ scores consequent to baseline and interventions. While the magnitude of effect varies, similar patterns of scores with an increase at the post-cohesion

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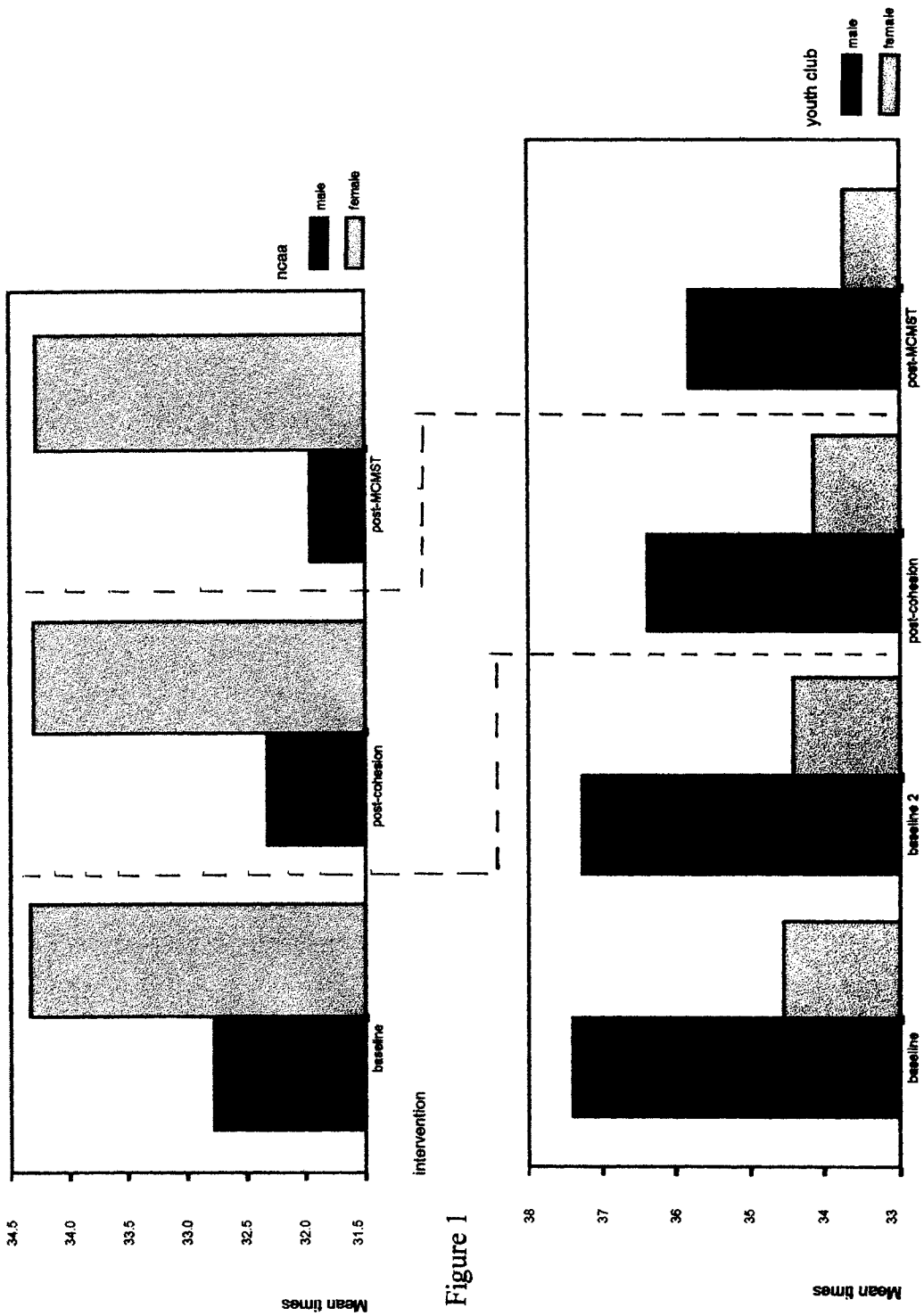

Figure 1

Figure 2

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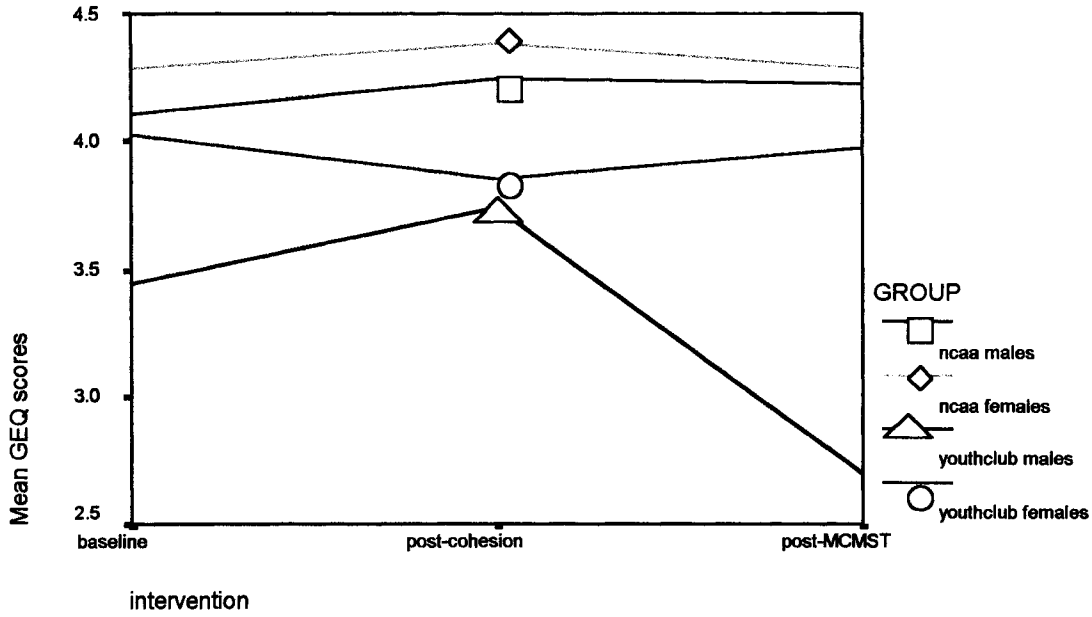

Figure 3

point are displayed by the NCAA males (+.10) and females (+.14), as well as the Youth Club males (+.29) on the post-cohesion intervention mean GEQ scores as compared to the mean baseline scores. This improvement in GEQ scores was expected, and seems to indicate an increase in cohesion after the Cohesion intervention was completed. Unexpectedly, the Youth Club females show a decline (-.17) in mean post-cohesion intervention GEQ scores.

A decline in mean GEQ scores relative to post-cohesion intervention GEQ scores was seen on the iteration of the GEQ conducted post-MCMST intervention. This was true for the NCAA males (-.10), females (-.02), and Youth Club males (-.14), again showing similar unity of pattern, but this time in the unexpected decline of scores post-MCMST intervention. However, the Youth Club females showed an expected increase in mean GEQ scores (+.12) after the MCMST intervention, making them the only group to do so.

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Subjective Evaluation

In order to determine the satisfaction of swimmers with the intervention program, two consumer satisfaction measures (see Appendices E and F) were administered. Results are contained in Table 3. Consumer Satisfaction I (CSI) consisted of seven questions on a 5-point Likert scale (1="Didn't help at all", 5= "extremely helpful"), asking participants to rate how they felt the various components of the intervention helped them improve their swim performance. Overall results for all groups on CSI indicated a mean rating of 2.20(.51) for NCAA men, 2.29(.71) for NCAA women, and 2.33(.68) for the Youth Club swimmers (only three Youth Club swimmers completed the CS forms). Of the seven components of the intervention participants were asked to evaluate, the NCAA men rated Relaxation and Imagery highest in terms of helping to improve their swim performance, Motivational and Technical statements as the second highest, and the Cohesion exercises lowest for helping to improve their swim performance. The men also rated the overall program as "somewhat helpful" in helping them to improve their performance. The NCAA women rated Motivational and Technical statements highest and Relaxation and Imagery as the second highest for helping to improve their swim performance, reversing the order of the NCAA men. Similar to the men, the women rated Cohesion exercises lowest for helping to improve their swim performance.

Consumer Satisfaction Questionnaire II (CSII) asked participants to rank order four statements in terms of how much they helped to improve their swimming performance (1= first place, 4=last place). The NCAA men gave "The Imagery and Cohesion groups improved my performance" as the highest mean rank ordered statement, while the NCAA women ranked "The Imagery and Cohesion groups improved my

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performance" and "The motivational and technical statements helped me to improve my performance" equally. Both men and women ranked "The cohesion groups helped to improve my performance" as last on the mean ordinal rankings.

Table 3 Means and standard deviations of Consumer Satisfaction scores by swim group and gender.

NCAA Swimmers	N	Mean Consat I:	Mean ConsatII:1	Mean ConsatII:2	Mean ConsatII:3	Mean ConsatII:4
Male	14	2.20(.51)	2.92(.99)	2.07(.99)	2.21(1.12)	2.78(1.25)
Female	18	2.29(.71)	3.31(.87)	2.19(1.17)	2.88(1.15)	2.19(.98)
Group	30	2.24(.64)	3.13(.92)	2.19(1.10)	2.51(1.18)	2.45(1.12)
Youth Club Swimmers						
Male	1					
Female	2					
Group	3	2.33(.68)	2.00(.00)	2.67(.58)	3.33(.58)	1.67(.58)

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CHAPTER 5

DISCUSSION

The results of this study support the efficacy of Mental Skills Training for performance enhancement, as expected. Overall results support the usefulness of a multi-component intervention (MCMST), consisting of imagery, cue-controlled relaxation, and mental preparation in enhancing swimming performance. However, this study was not designed to determine what percentage of the intervention effect was due to any particular skill included in the package. Instead, the focus was on providing an empirically based effective skills package to enhance the probability of an effect, and encourage the swimmers to utilize mental training as a regular part of their training regimen. Bull (1989) was able to show the positive effects of an intervention package consisting of self-talk, relaxation, and visualization on an ultradistance runner's performance. Overall, the package approach tends to produce more practical benefits for participant athletes due to the increased likelihood of a treatment effect (Azrin, 1977; Patrick & Hrycaiko, 1998).

Hypotheses

Hypothesis I "There will be a meaningful increase in mean scores on the GEQ after the cohesion intervention in both the NCAA swimmers and the Youth Club swimmers" was lent support by expected increases that occurred in the mean GEQ score

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at the post-cohesion intervention measurement point for both male groups, as well as the NCAA females. However, support for Hypothesis I was equivocal, due to the unexpected decrease in mean GEQ scores at the post-cohesion intervention measurement shown by the Youth Club females. Unfortunately, only two female Youth Club swimmers completed CSI &II, so no conclusions may be drawn regarding their subjective evaluation of the relative importance of the Cohesion intervention in helping to improve swim performance.

Hypothesis II "There will not be a meaningful change in mean performance times after the cohesion intervention in either group." Unexpectedly, experimental results failed to support Hypothesis II when enhanced swimming performance was recorded at the post-cohesion measurement, thus indicating an immediate intervention effect with regard to performance improvement for the cohesion intervention.

Interestingly, on both Consumer Satisfaction Questionnaires (CSI & II), both male and female NCAA swimmers rated the cohesion intervention as "least effective" in helping to improve their swimming. Additionally, due to the fact that unexpected improvement correlated with the cohesion intervention did occur, the post-cohesion intervention swim performance measurements could no longer function as a control as was conceived at the start of the study, thus opening up the possibility that an unidentified extraneous variable influenced performance. Therefore, it can be said that the MCMST intervention was the probable cause of enhanced swimming performance, rather than unequivocally causing an immediate intervention effect as with the cohesion intervention. However, Kazdin (1998) notes that one of the functions of a multiple baseline study is to eliminate the possibility that an extraneous variable was responsible

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for the change in performance, thus the intervention is staggered across participants. The influence of extraneous variables is usually discredited by the repeated demonstration of performance changes in response to the intervention. Again, with the exception of the NCAA females, the experimental groups did repeatedly demonstrate performance enhancement in response to the MCMST intervention. The NCAA females showed almost no change in performance across interventions; in fact, the change in swim performance that did occur (-.03) across interventions was less than probably attributable to the effect of training (-.13).

Hypothesis III "There will be no relationship between improved cohesion, as measured by an increase in mean scores on the GEQ, and improved mean performance times in either group " was definitively unsupported by the results of both the NCAA men and the Youth Club males, but was partially supported by the NCAA females mean GEQ scores and swim performance times, as their GEQ scores improved from baseline to post-cohesion, while their swim times did not improve beyond the probable effects of training. There were no significant correlations found between the mean change in GEQ scores and mean change in swim performance times for any group.

Clearly, the results in this study found gender to be an important variable in both performance and cohesion. Interestingly, the meaningful effect of gender on performance in the NCAA females, and on mean GEQ scores in the Youth Club females, has support in the literature by researchers (Gilligan,1982 ; Matheson & Mathes, 1997) who speculate that increased cohesion on female co-acting sport teams may actually result in poorer performances due to a female tendency toward cooperation, and not competition. Women are attracted to partnership models of competition, supporting each other in task mastery,

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rather than attempting to beat a rival (Matheson & Mathes, 1997). A possible explanation for the lack of performance improvement seen with the NCAA females, and the corresponding increase in GEQ scores, as contrasted with the Youth Club females results, whose swim performance improved as GEQ scores decreased, may lie in the relative differences in swimming accomplishment between the two female groups. The NCAA females, who have already achieved a place on a major college swim team, and no longer need to compete directly with teammates, would show the effects of increased cohesion in lack of performance improvement, being oriented towards cooperation, and away from competition within the team. In contrast, the Youth Club females, who are attempting to obtain a coveted place on a major university swim team and the scholarship that would likely accompany it, would actively avoid increasing cohesion, seeing their teammates as rivals, and having the need to actively compete against their teammates (Carron, 1988).

Hypothesis IV "There will be a meaningful improvement in performance times as evidenced by a meaningful reduction in mean swim time after the multi-component intervention in both groups " is supported, although not unequivocally. Unexpectedly, the NCAA females did not manifest the reduction in swim times recorded for the other experimental groups; in fact, the NCAA females recorded a differential of .03 secs. across interventions, less than that attributable to the training effect.

Hypothesis V "There will be a meaningful improvement in cohesion, as measured by higher mean GEQ scores, after the multi-component intervention, compared to mean GEQ scores after the cohesion intervention in both groups" was eqivocally supported by the results. Specifically, the decrease in mean GEQ scores that was recorded at the post-MCMST intervention testing for NCAA females and both male

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groups was unexpected. Interestingly, these three groups displayed the same pattern of variation in GEQ scores throughout baseline and intervention measurements. However, the Youth Club females showed an expected increase at the post-MCMST measurement point, offering partial support for Hypothesis V. Overall, when compared to the scores of the Youth Club males, NCAA females, and NCAA males, the Youth Club females displayed an inverse pattern of mean GEQ scores; that is, a decrease at the post-cohesion measurement, and an increase at the post-MCMST measurement.

Hypothesis VI " There will be similar patterns of performance between groups across time on changes in scores for the GEQ and swim performance times" was supported by the same pattern of variation in GEQ scores throughout baseline and intervention measurements displayed by three of the four groups (NCAA males, females, and Youth Club males). The Youth Club females showed an expected increase at the post-MCMST measurement point, offering partial support for Hypothesis V. Overall, when compared to the scores of the Youth Club males, NCAA females, and NCAA males the Youth Club females displayed an inverse pattern of mean GEQ scores; that is, a decrease at the post-cohesion measurement, and an increase at the post-MCMST measurement.

Overall, the results of this study did not find support for a negative relationship between cohesion and performance in a coacting sport. This finding supports the work of researchers (Williams & Widmeyer, 1991) who found a positive relationship between cohesion and performance, and this study contributes to the existing literature in the cohesion-performance area, as well as gender as a moderating variable in that relationship. The typical conclusion by reviewers of sports psychology research has been

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that the relationship between cohesion and performance is positive in interacting sports and negative in coacting sports (Bird, 1977; Bray & Whaley, 2001; Carron, 1988; Cox, 1990; Gill, 1986). Finally, the question of significance in the changes in swim performance times must be addressed. This study did not use inferential statistics in an attempt to determine if the performance improvements that occurred were significant. In reviewing multiple baseline studies evaluating performance enhancement in the sports psychology literature, various measures of significance were used, including social validity assessments for participants and coaches in figure skating (Ming & Martin, 1996); social validation and elapsed time improvements in a 1600 meter run (Patrick & Hrycaiko, 1998); translating elapsed time improvements into distance run improvements in 100 meter runners (Mallet& Hanrahan, 1997); and videotape observation and quantitative recording of desired behaviors by a coach and experimenter, as well as social validation by the participants in basketball (Kendall, et al. 1990). None of the cited studies used inferential statistics as a determinant of significance of changes in performance, and no multiple baseline studies were found that did. The question of significance remains, however, and can best be addressed in terms of athletic, as opposed to statistical, significance. The first eight male finishers in the 50 meter freestyle at the 2000 Sydney Olympics finished within .53 seconds of each other. The medallists finished within .05 seconds of each other (cbssportsline.com/u/olympics/2000/results). This study produced improvements in swim times of - .82 seconds for the NCAA Division I men, all competitive on a national level, two of whom had competed in the 2000 Olympics. Even allowing for a probable training effect of .26 seconds (.13 seconds for each intervention period, as compared to the original control group), an improvement of - .56 seconds still

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remains. That number must reasonably be considered athletically significant, and is more remarkable when ceiling effects probably operating in elite level athletes are taken into account.

Using the same standards for the Youth Club men, a net improvement of -1.19 seconds was recorded. Again, an athletically significant improvement, even in athletes that are still considered to be in a developmental stage, even though several of the Youth Club men are national caliber swimmers.

For the women, the top eight finishers in the 50 meter freestyle at the 2000 Sydney Olympics were within 1.32 seconds of each other, with the medallists within .31 seconds. In this study, NCAA women showed almost no change in swimming times, so their results are not athletically significant. The Youth Club females showed an overall improvement of .69 seconds with a net result after subtracting for a possible training effect of -.33 seconds. It would be reasonable to consider this result athletically significant.

In terms of suggestions for future research, the results of this study indicate clear differences between genders, and age, on the relationship between performance and cohesion. More research needs to focus in this area, as well as investigating differences that may exist between the nature of cohesion, performance, and type of sport, whether interactive and coactive. Specifically, in what ways would future performance enhancement strategies need to take the results of this study into account when constructing protocols to help athletes improve their overall performance? At least one suggestion might be to instruct female NCAA swimmers to image themselves competing

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against a clock, rather than an individual, hopefully thus maintaining or increasing team cohesion, and redirecting competitive focus outside of the team to an objective standard.

Ultimately, the challenge as a practicing sport psychologist is to devise efficacious performance strategies based on empirical research. Anecdotal reports of athlete experience, or retrospective athlete subjective reports, while interesting, may not be the most accurate sources of information. For example, in this study, both groups of NCAA athletes rated the Cohesion intervention as the least effective at improving their swimming performance, when in fact, greater, and more consistent time improvements were seen at the post-cohesion intervention mark than at the post-MCMST mark. That may be partially explainable by questioning the progression of possible improvement; that is, is it a linear progression of improvement throughout the season, or does possible improvement follow a progression related to ceiling effects, with a swimmer showing a lesser degree of improvement as they approach the limits of their physiological potential over the season. If this is indeed the case, then the results of the MCMST intervention would be more impressive than the Cohesion intervention. This would be another area for further research, and might require a collaborative exploration with Exercise Physiologists.

Lastly, and quite importantly, researcher/athlete/coach interaction needs to be examined. In this study, that interaction became problematic at times, and it may have become an extraneous variable affecting intervention results. The following are several specific examples. For instance, the original swim tests sets were designed to consist of twenty repetitions of a fifty meter swim at the request of the head swim coach, as " this is something we would do in our normal course of training." After the first test set had been

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performed, the swim coach informed the head research assistant that it was "too difficult for my swimmers to do twenty repetitions, and I want to change it to ten." This eliminated the establishment of two baseline measurements for the NCAA swimmers as recommended by Kazdin (1997) when using multiple baseline designs, and may have had an effect on experimental integrity. Another incident occurred immediately prior to the third and final meeting for the MCMST intervention. At the scheduled start of the session, only a few swimmers had arrived at the meeting room utilized for the intervention. They informed the head researcher that the coach was meeting with the team, and apparently had forgotten about the previously scheduled intervention meeting. When the head researcher went to speak with the coach, he angrily told his swimmers to go to the meeting room, and then walked down the hallway, yelling at the head researcher, stating that he "wasn't getting what he thought he would out of the program", and he was going to cancel the final test set. This occurred within the hearing of several of the swimmers. The head coach did subsequently relent, and permit the final test set for the NCAA swimmers to be conducted as scheduled. Lastly, the Head Coach consistently failed to inform the assistant coaches about previously scheduled research meetings on several occasions, and refused to permit the head researcher to give the assistant coaches a printed schedule of the agreed upon schedule of events. The head coach stated that he reserved the right to change the schedule at his discretion, based on his sense of what the team needed or was feeling, without informing any of the staff or researchers beforehand. This clearly had the potential to generate difficulties, and in fact, did. This was especially ironic in that the head coach and head researcher met on six separate occasions prior to initiating the study for the express purpose of constructing an intervention, and schedule,

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that would meet the needs of the swim team, and fit into the time the head coach was willing to allot to the research.

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APPENDIX A:

ATHLETE INFORMED CONSENT FORM

UNLV

University of Nevada Las Vegas

Athlete Informed Consent

Kevin Lancer, M.A., a Ph.D. student in the Clinical Psychology department at the University of Nevada Las Vegas, is the primary investigator in this study. Dr. Brad Donohue, a faculty member of the UNLV department of psychology, is supervising him. He and his colleagues are interested in enhancing the performance of swimmers, and giving the swimmers a useful psychological tool for further improvements in performance and growth in the sport of swimming.

DESCRIPTION

In this study, participants will be asked to complete two sports psychology instruments, the Group Environment Questionnaire (GEQ), and the Sports Imagery Questionnaire (SIQ), a demographics questionnaire, a protocol treatment adherence questionnaire, and a consumer satisfaction questionnaire. Participants will participate in two interventions. The first is team building, or cohesion, exercises. Participants will participate in discussions and exercises relating to team cohesion (i.e., trust exercises, statements of what they like about each other; self and other perceptions of roles on the team, characteristics desired by team). The second is a multi-component intervention, consisting of listening to audiotapes with relaxation, mental preparation, and an imagery component on them. Performance effects will be measured by participants being tested in a set of 20 x 50 yard swims (on a total of five separate occasions), and the average times being taken and compared.

Risks and Benefits

Direct benefits are possible, but not guaranteed. Benefits include the opportunity to participate in psychological exercises that can improve swimming performance, and contributing to the body of knowledge about sport psychology and performance enhancement. This study also has scientific merit, as it will be addressing an issue of concern in sport psychology, that of personalizing the intervention for the individual athlete. Interventions may improve performance, but improvements may also not occur. As with any sport, there is a risk of injury, although it is expected that this risk would be no greater than that present during a typical swim workout. Any concerns about participation in this study must be answered by the person who does the interventions, or Kevin Lancer directly at (702) 895-2468, or Dr. Donohue, at (702) 895-0181. Questions

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about the rights of research participants may be answered by UNLV staff at the Office for the Protection of Research Subjects (702) 895-2794.

COSTS AND PAYMENTS

Your time is the only cost that you will personally incur. There is a cost of approximately 30 minutes to review this form, and have your questions answered if the need arises. There will be a total of 6 occasions where participants will be interacting with researchers for 40 minutes each time. (Total: 4 hours) The test sets of 10x50 yd swims are included as part of the regularly scheduled practice times, so no additional time will be required. During the multi-component intervention, you will be asked to listen to the audiotapes provided at home or on your free time. The tapes are approximately 15 minutes in length; there is no time estimate available for this, as each participant will determine the amount of time they spend in listening to the tapes. If you are a student in psychology 101, participation in this study will satisfy the 3 research hour requirement for that course.

CONFIDENTIALITY

All information obtained during the course of this study is strictly confidential and will be available only to authorized research team members. Coaches and other swim team personnel will only have access to the test set times, as these are a part of regular team practice procedures. Reports in scientific journals will not include any information that identifies subjects in this study. Study records will be coded with an identification number to further protect subject confidentiality, kept in a locked, secure facility, and destroyed in four years.

RIGHT TO WITHDRAW AT ANY TIME

Participants are free to refuse to participate in this study, and free to withdraw at any time without penalty or prejudice. Withdrawal will in no way negatively affect the participant. However, research credit hours will be given for hours of study participation only. If the participant completes the study in less than 3 hours, 3 hours of research credit for Psychology 101 will still be awarded to the subject.

VOLUNTARY CONSENT

I have read the information above and agree to its contents. All of my questions concerning this research have been answered. If I have any questions in the future about this study, Kevin Lancer or Dr. Donohue will answer them. A copy of this form will be given to me.

Signature of
Participant:_____Date:_____

Printed Name: _____

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APPENDIX B:

PARENTAL INFORMED CONSENT FORM

UNLV

University of Nevada Las Vegas

Parental Informed Consent

Kevin Lancer, M.A., a Ph.D. student in the Clinical Psychology department at the University of Nevada Las Vegas, is the primary investigator in this study. Dr. Brad Donohue, a faculty member of the UNLV department of psychology, is supervising him. He and his colleagues are interested in enhancing the performance of swimmers, and giving the swimmers a useful psychological tool for further improvements in performance and growth in the sport of swimming.

Description

In this study, your child will be asked to complete two sports psychology instruments, the Group Environment Questionnaire (GEQ), and the Sports Imagery Questionnaire (SIQ), a demographics questionnaire, a protocol treatment adherence questionnaire, and a consumer satisfaction questionnaire. Your child will participate in two interventions. The first is team building, or cohesion, exercises. Your child will participate in discussions and exercises relating to team cohesion (i.e., trust exercises, statements of what they like about each other; self and other perceptions of roles on the team, characteristics desired by team). The second is a multi-component intervention, consisting of listening to audiotapes with relaxation, mental preparation, and an imagery component on them. Performance effects will be measured by your child being tested in a set of 20 x 50 yard swims (on a total of five separate occasions), and the average times being taken and compared.

RISKS AND BENEFITS

Direct benefits are possible, but not guaranteed. Benefits include the opportunity to participate in psychological exercises that can improve swimming performance, and contributing to the body of knowledge about sport psychology and performance enhancement. This study also has scientific merit, as it will be addressing an issue of concern in sport psychology, that of personalizing the intervention for the individual athlete. Interventions may improve performance, but improvements may also not occur. As with any sport, there is a risk of injury, although it is expected that this risk would be no greater than that present during a typical swim workout. Any concerns about participation in this study must be answered by the person who does the interventions, or Kevin Lancer directly at (702) 895-2468, or Dr. Donohue, at (702) 895-0181. Questions

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about the rights of research participants may be answered by UNLV staff at the Office for the Protection of Research Subjects (702) 895-2794.

COSTS AND PAYMENTS

Your child's time is the only cost that will be incurred. As a parent, there will be a time cost to you of approximately 30 minutes to review this form, and ask questions if need be. There will be no additional travel time required for parents. All activities will take place in the regular practice location (Buchanan Natatorium) and within the regularly scheduled practice times. There will be a total of 6 occasions where your child will be interacting with researchers for 40 minutes each time. (Total: 4 hours) The test sets of 10x50 yd swims are included as part of the regularly scheduled practice times, so no additional time will be required. During the multi-component intervention, your child will be asked to listen to the audiotapes provided at home or on their free time. The tapes are approximately 15 minutes in length; there is no time estimate available for this, as each participant will determine the amount of time they spend in listening to the tapes.

CONFIDENTIALITY

All information obtained during the course of this study is **strictly** confidential and will be available only to authorized research staff members. Coaches will have access only to the average times in the test sets, as this is a regularly scheduled part of practice and would take place regardless of whether or not a study was being conducted. Reports in scientific journals will not include any information that identifies subjects in this study. Study records will be coded with an identification number to further protect subject confidentiality, kept in a locked secure facility, and destroyed in four years.

RIGHT TO WITHDRAW AT ANY TIME

Your child is free to refuse to participate in this study, and free to withdraw at any time without penalty or prejudice. Withdrawal will in no way negatively affect your child.

VOLUNTARY CONSENT

I have read the information above and agree to its contents. All of my questions concerning this research have been answered. If I have any questions in the future about this study, Kevin Lancer or Dr. Donohue will answer them. As the consenting parent, this is the only form I have to complete, and a copy of questionnaire and the Parental Informed Consent has been given to me.

Signature of Parent:_____

Printed name: _____

Date:_____

Name of Minor Participant:_____

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APPENDIX C:

MINOR INFORMED ASSENT FORM

UNLV

University of Nevada Las Vegas

Minor Informed Assent

You are being invited to participate in a research project conducted by Kevin Lancer, M.A., a Ph.D. student in the Clinical Psychology department at the University of Nevada Las Vegas. He is what is called the primary investigator. Dr. Brad Donohue, a faculty member of the UNLV department of psychology, is supervising him. He is interested in helping improve the performance of swimmers.

Invitation to participate

The main reason you are being invited to participate in this is because you are a swimmer between 13-17 years old, and train with Rebel Aquatics.

DESCRIPTION OF THE PROJECT

In this project, you will be asked to complete two separate sets of sports psychology questions. One is called the Group Environment Questionnaire (GEQ), and the other one is called the Sports Imagery Questionnaire (SIQ). Your must complete these without your parents help. We also want you to fill out a brief questionnaire that asks your name, age, and other questions about your swimming history. Your parents can help you fill those out if you want. There will also be a simple questionnaire that asks questions about how many times you did your at-home exercises, and whether or not you were satisfied with the results. Everyone will participate in two different types of exercises. The first is team building, or cohesion, exercises. The second is called a multi-component exercise, and has three separate parts: You will listen to audio tapes that (1) help you relax, (2) get psyched up, and (3) picture the ideal swim. Your performance will be measured doing a test set of 10 x 50 yard swims (on a total of five separate occasions), and the average times taken and compared.

RISKS AND BENEFITS

Benefits include the chance to be part of exercises that may improve swimming performance, and help add to knowledge about sport psychology and ways to improve performance. These exercises may improve performance, but we can't guarantee that it will. As with any sport, you could get hurt during a workout, but the chance of that happening is no greater than during a regular swim workout. Any questions about being in this project will be answered by the person who gave you this form, or Kevin Lancer directly at (702) 895-2468, or Dr. Donohue, at (702) 895-0181.Questions about the

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rights of research participants may be answered by UNLV staff at the Office for the Protection of Research Subjects (702) 895-2794. If you ever feel uncomfortable during the project because of what we are talking about or doing, tell me right away, and I will explain it to you.

Costs and Payments

Your time is the only cost that involved. It may take up to 30 minutes to review this form, and ask any questions you may have. Your parents will not have to do any extra driving as a result of this study. There will be a total of 6 occasions where you will be interacting with researchers for 40 minutes each time. (Total: 4 hours) The test sets of 10x50 yd swims are included as part of regularly scheduled practice, so no additional time will be needed. During the multi-component intervention, you will be asked to listen to the audiotapes provided at home or on your free time. The tapes are about 15 minutes long; there is no time estimate available for this, as you will determine the amount of time you spend listening to the tapes.

CONFIDENTIALITY

All information obtained during the course of this study is **strictly** confidential and will be available only to authorized research staff members. Coaches will have access only to the average times in the test sets, as this is a regularly scheduled part of practice and would takes place anyhow. Reports in scientific journals will not include any information that identifies anybody in this study. Study records use a code number instead of a name, and are kept locked up. They are destroyed in four years.

VOLUNTARY CONSENT

You do not have to be in the project if you don't want to. If you decide to be in the project, and then change your mind, you can stop whenever you want. You will not get in trouble. You should talk about this with your parents or guardians before you agree to be in the project and sign below. Your parents or guardians will be asked if it is okay for you to be in the project I will be happy to answer any of your questions regarding the project. If you think of any questions later, you or your parents can call the numbers listed in the Risks and Benefits section for answers. By signing below, you agree to be in this project.

I have read the information above and agree to be in the project. All of my questions about this project have been answered. If I have any questions in the future about this study, Kevin Lancer or Dr. Donohue will answer them. I will get to keep a copy of this form.

Signature of Minor Participant

_____Date:_____

Printed Name: _____

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APPENDIX D:

THE SPORT IMAGERY QUESTIONNAIRE

Sport Imagery Questionnaire

Please fill in the blank or circle the appropriate answer:

Sport: Sex: M/F

Level of competition:

Athletes use mental imagery extensively in their training and in conjunction with competition.

Imagery serves two functions. The motivational function of imagery can represent emotion-arousing situations as well as specific goals and goal-oriented behaviors. The cognitive function entails the mental rehearsal of skills and strategies of play. A strategy is a plan or method of achieving some goal. In sport, this often is referred to as a game plan. For example, playing a *pressure game* to create turnovers is a possible strategy to use in basketball, and this could be done executing various skills and tactics (i.e., skills put together in a sequence) such as presses and man-on-man defenses. Another example of a strategy would be playing a *baseline* game in tennis; how this is actually accomplished (i.e., the skills performed) would vary considerably over the course of a game. This questionnaire was designed to assess the extent to which you incorporate imagery into your sport. Any statement depicting a function of imagery that you rarely use should be given a low rating. In contrast, any statement describing a function of imagery which you use frequently should be given a high rating. Your ratings will be made on a seven-point scale, where *one* is the rarely or never engage in that kind of imagery end of the scale, and *seven* is the often engage in that kind of imagery end of the scale. Statements that fall within these two extremes should be rated accordingly along the rest of the scale. Read each statement below and fill in the blank the appropriate number from the scale provided to indicate the degree to which the statement applies to you when you are practicing or competing in your sport. Don't be concerned about using the same numbers repeatedly if you feel they represent your true feelings. Remember, there are no right or wrong answers so please answer as accurately as possible.

Rarely/ Often (1 2 3 4 5 6 7)

(1) I make up new plans/strategies in my head._____

(2) I image the atmosphere of winning a championship (e.g., the excitement that follows winning a championship). _____

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(3) I image giving 100% during an event/game._____

(4) I can re-create in my head the emotions I feel before I compete._____

(5) I image alternative strategies in case my event/game plan fails._____

(6) I imagine myself handling the stress and excitement of competitions and remaining calm. _____

(7) I imagine other athletes congratulating me on a good performance._____

(8) I can consistently control the image of a physical skill._____

(9) I image each section of an event/game (e.g., offense vs. defense, fast vs. slow)._____

(10) I image the atmosphere of receiving a medal (e.g., the pride, the excitement, etc.)_____

(11) I can easily change an image of a skill._____

(12) I image the audience applauding my performance._____

(13) When imaging a particular skill. I consistently perform it perfectly in my mind._____

(14) I image myself winning a medal._____

(15) I imagine the stress and anxiety associated with competing._____

(16) I image myself continuing with my game/event plan, even when performing poorly._____

(17) When I image a competition, I feel myself getting emotionally excited._____

(18) I can mentally make corrections to physical skills._____

(19) I imagine executing entire plays/programs/sections just the way I want them to happen in an event/game._____

(20) Before attempting a particular skill, I imagine myself performing it perfectly._____

(21) I imagine myself being mentally tough._____

(22) When I image an event/game that I am to participate in, I feel anxious._____

(23) I imagine myself appearing self-confident in front of my opponents._____

(24) I imagine the excitement associated with competing._____

(25) I image myself being interviewed as a champion._____

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(26) I image myself to be focused during a challenging situation._____

(27) When learning a new skill, I imagine myself performing it perfectly._____

(28) I imagine myself being in control in difficult situations._____

(29) I imagine myself successfully following my game/event plan._____

(30) I image myself working successfully through tough situations (e.g. , a power play, sore ankle, etc.)._____

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APPENDIX E:

THE GROUP ENVIRONMENT QUESTIONNAIRE (GEQ)

Instructions to Respondents

This questionnaire is designed to assess your perceptions of your athletic team. There are no right or wrong answers so please give your immediate reaction. Some of the questions may seem repetitive but please answer ALL questions. Your candid responses are very important to us. Your responses will be kept in strict confidence. Neither your coach or anyone other than the researcher will see your responses.

The following questions are designed to assess your feelings about **YOUR PERSONAL INVOLVEMENT** with this team. Please **CIRCLE** a number from 1 to 9 to indicate your level of agreement with each of the statements.

1. I do not enjoy being part of the social activities of this team.

1	2	3	4	5	6	7	8	9
Strongly Disagree								**Strongly Agree**

2. I am not happy with the amount of playing time I get.

1	2	3	4	5	6	7	8	9
Strongly Disagree								**Strongly Agree**

3. I am not going to miss the members of this team when the season ends.

1	2	3	4	5	6	7	8	9
Strongly Disagree								**Strongly Agree**

4. I am unhappy with my team's level of desire to win.

1	2	3	4	5	6	7	8	9
Strongly Disagree								**Strongly Agree**

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5. Some of my best friends are on this team.

1	2	3	4	5	6	7	8	9
Strongly Disagree								**Strongly Agree**

6. This team does not give me enough opportunities to improve my personal performance.

1	2	3	4	5	6	7	8	9
Strongly Disagree								**Strongly Agree**

7. I enjoy other parties more than team parties.

1	2	3	4	5	6	7	8	9
Strongly Disagree								**Strongly Agree**

8. I do not like the style of play on this team.

1	2	3	4	5	6	7	8	9
Strongly Disagree								**Strongly Agree**

9. For me, this team is one of the most important social groups to which I belong.

1	2	3	4	5	6	7	8	9
Strongly Disagree								**Strongly Agree**

The following questions are designed to assess your perceptions of **YOUR TEAM AS A WHOLE.** Please CIRCLE a number from 1 to 9 that best indicates your level of agreement with each of the statements.

10. Out team is united in trying to reach its goals for performance.

1	2	3	4	5	6	7	8	9
Strongly Disagree								**Strongly Agree**

11. Members of out team would rather go out on their own than get ogether as a team.

1	2	3	4	5	6	7	8	9
Strongly Disagree								**Strongly Agree**

12. We all take responsibility for any loss or poor performance by our team.

1	2	3	4	5	6	7	8	9
Strongly Disagree								**Strongly Agree**

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13.Our team members rarely party together.

1	2	3	4	5	6	7	8	9
Strongly Disagree								**Strongly Agree**

14. Out team members hav conflicting aspirations for the team's performance.

1	2	3	4	5	6	7	8	9
Strongly Disagree								**Strongly Agree**

15. Out team would like to spend time together in the off season.

1	2	3	4	5	6	7	8	9
Strongly Disagree								**Strongly Agree**

16. If members of our team have problems in practice, everyone wants to help them so we can get back together again.

17.Members of our team do not stick together outside of practices and games.

1	2	3	4	5	6	7	8	9
Strongly Disagree								**Strongly Agree**

18. Members of our team do not communicate freely about each athlete's responsibilities during competition or practice.

1	2	3	4	5	6	7	8	9
Strongly Disagree								**Strongly Agree**

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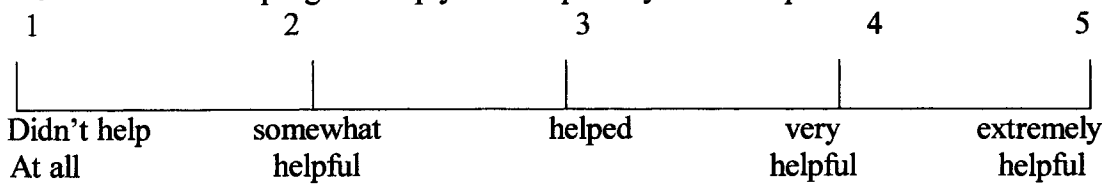
APPENDIX F:

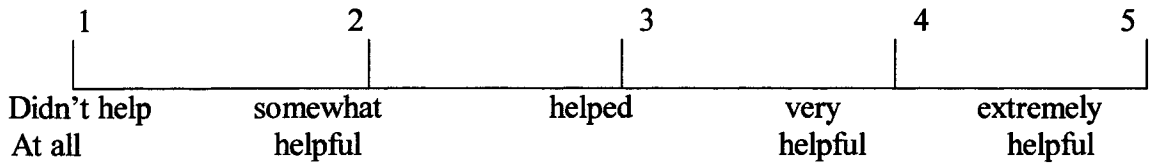
CONSUMER SATISFACTION QUESTIONNAIRE I

Consumer Satisfaction Questionnaire I Subject #_____
Please rate the following statements:

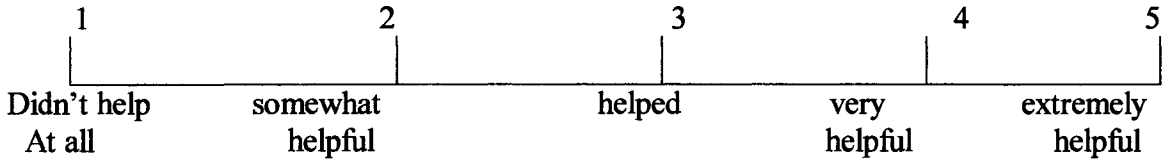
1) How much did this program help you to improve your swim performance?



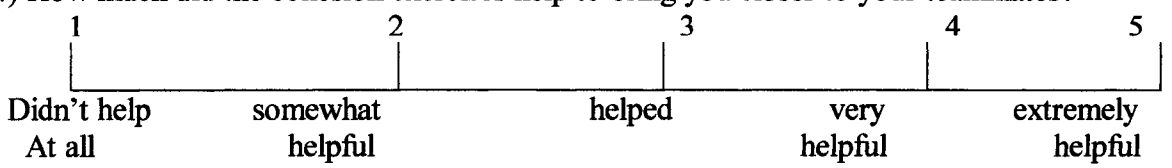
2) How much did the cohesion exercises help to improve your swim performance?



3) How much did the relaxation and imagery exercises with the motivational and technical statements help you to improve your swim performance?



4) How much did the cohesion exercises help to bring you closer to your teammates?



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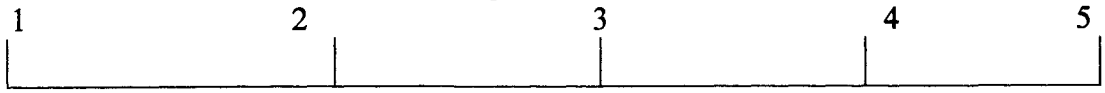
5) How much did the cohesion exercises help to bring the team closer together?

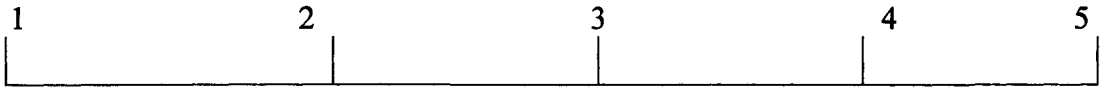


Didn't help At all | somewhat helpful | helped | very helpful | extremely helpful

6) How much did the relaxation and imagery help you to improve your swim performance?

Didn't help At all | somewhat helpful | helped | very helpful | extremely helpful

7) How much did the motivation and technical statements help you to improve your swim performance?



Didn't help At all | somewhat helpful | helped | very helpful | extremely helpful

8) What suggestions can you make for the future improvement of this performance enhancement program ?

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APPENDIX G:

CONSUMER SATISFACTION QUESTIONNAIRE II

Please rank order these statements in terms of how much they helped to improve your swim performance, with 1= first place, and 4 = last place.

____ The cohesion groups improved my performance.

____ The Imagery and Cohesion groups improved my performance

____ The cohesion groups improved my relationship with my teammates

____ The motivational and technical statements helped me to improve my performance.

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APPENDIX H:

PROGRESSIVE MUSCULAR RELAXATION SCRIPT

PMR SCRIPT OUTLINE

Begin with rationale:
There are subtle differences between tension and relaxation, just the right amount of arousal and too much or too little arousal. The purpose of this Progressive Muscle Relaxation exercise is to increase your awareness of those subtle differences between tension and relaxation, and become more in tune with those differences in you. The end result of this session, the homework, and the following sessions will be to create a state of **energized relaxation** that you can control, have personal ownership of, and step into at will.

INJURIES-

If anyone is hurt, has a back problem, injured wrist, knee, anything at all—when we come to the tension section for that part of your body, don't do it.

LET'S GO AHEAD AND BEGIN OUR PROGRESSIVE MUSCULAR RELAXATION EXERCISES...

General Instructions before we start:

(1) get into a comfortable sitting position, legs straight out ahead of you, back supported against a wall or other vertical surface.
(2) We will do about 6 seconds of tension, with about 12 seconds of relaxation for each body part.
(3) We start at the head, and go down to the toes.

Let's begin:
Sinking:
Close your eyes....Make yourself as comfortable as you can...become aware of the surface underneath you...let your body settle into it...notice how it supports you...notice the points of contact between you and the floor or wall:...your head...shoulders...spine... ribs... hips... backs of your legs...heels...elbows...forearms and hands...feel your body sinking into the surface you are sitting on....Take a good deep breath starting from your abdomen...feel your shoulders rise as your lungs fill with

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air... hold it for a brief moment, then as you let it out, feel it take your tensions away...let your breathing settle into a gentle rhythm...

HEAD

We start with the head...keep your chin in, press your head back against the support...press it back, making a double chin in the front... stop short of any kind of discomfort...Now...notice the feelings you get from the working muscles...tension in the back of the neck....and ...relax...let go...feel the area relax....be aware the sense of ease that flows into the area...allow the relaxation to deepen until all the tension has left your neck....

EYEBROW RAISING

Now moving to the face... Moving to the many muscles responsible for subtle changes of expression, start by scrunching up your forehead.... contract those brow muscles....Now hold the scrunch...notice the tension in your forehead...and.....relax...let the tension flow out...feel the furrows in your brow being smoothed out ...continue until there is no tension left in your brow...then just a little but further....

Now...focus on your frowning muscle....bring the eyebrows closer together, buckling the skin between them into a deep, deep, frown....hold it for a few moments, taking notice of the sensation you get from the action...then relax, release the tension...feel the eyebrows relax and spread sideways...imagine the space between them get wider and continue to get wider...notice the comfortable feeling that accompanies this idea...continue until all the tension has died away...

Now we come to the **eyes**...first, I'd like you to screw them up, and notice the sensation you get from this action....now just spend a moment registering that....and relax, let it go...let the muscles around the eye loosening up...notice the feeling you get from loosening them...feel the skin smoothing out...now, without moving the head, turn your eyes upwards behind your closed eyelids...now hold your gaze upwards for a few moments...notice the tension in the muscles...bring your eyes back to a central position ...now look down as if towards your feet...hold it.... hold it a few moments... now return to the center...now look to the right...keep it steady....then return to the front...now to the left....hold it...hold it...then bring your eyes back to the front, and relax...let your eyes feel relaxed...now their resting in the middle position...compare this with how they felt when they were working...continue just relaxing your eyes...now roll your eyes in a clockwise circle.... Notice the sensations of tension...pause...now roll them in a counterclockwise direction...notice the feelings of tension, of muscles working....and .....relax.....bring them back to center and let them fully relax....go on relaxing until all the tension has left them..

Now we go on to the **jaw**...bring your back teeth together...do it firmly. But without actually clenching them...now feel a sensation in your jaw as if you've been chewing tough meat....hold it...hold it...and relax...release the jaw muscles...fell the tension fading....continuing to fade...and further still...just fading out...

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Now you **lips**...press your lips tightly together as if you were rejecting some unpleasant medicine....now hold your lips pursed together...that's it...now relax...let it go...as they relax, notice feelings of the warmth and the blood flowing back into your lips...and tune into the feelings of relaxation...

Finally ,the **Tongue**...press your tongue into the roof of your mouth and hold it there...that's it ...now feel the tension in the tongue.....hold it ....and relax...notice how it feels when you relax it...now press it against the inside of your right cheek....now hold it...and relax...and against your left cheek...now hold...and relax...now pull it back towards your throat... not too strongly...hold it... and relax...let your tongue settle in the middle of your mouth, just touching the backs of your front teeth...feel it releasing tension...let it go on relaxing...enjoying the feeling of relaxation...let that feeling spread throughout your mouth and over your face....making it feel warm, glowing and relaxed...then let it spread to cover your neck and shoulders...

Now , moving back to your **neck**, I 'd like you to lift your **shoulders**...hunch them up, as if to touch your ears with your shoulders...high as you can....now feel the tension in the lower neck...register the sensation....now ....relax...let the shoulders drop...let them go on dropping...further ...and further...and further... as the tension just ebbs away...feel your shoulders completely relaxed....

Now moving to the region of the **back**, bring your attention to the shoulder blade bones just behind your shoulders...draw them back so they get nearer to each other, without putting too much effort into it...now feel the being gently squeezed together...notice also how your chest is lifted away from the supporting surface...and then...relax...release the tension...let your muscles soften up....feel your back pressing once again in contact with the supporting surface...nice and easy... notice the feeling of relaxation, and let that feeling continue on and on...good..

Now we focus on the **abdominal** muscles...make the area over your internal organs go flat and hard as you pull the muscles in, pulling them back all the way to your spine if you can...now you hold that...now feel the tension under your ribs...over your organs, and around the back of your pelvis...then hold it...relax... let go...allow your muscles just to spread themselves out...feel a sense of deep relaxation, and let that relaxation become deeper as the moments pass...

Turn your attention to your **breathing** again...notice it's rhythm... place one hand over your upper abdomen, and notice the gentle swell and recoil of the area underneath it....the rise and fall...the in and the out of the abdomen ...and the breath working naturally together without any effort...avoid any inclination to alter the rhythm, just let the breathing take care of itself...nice and easy , a natural rhythm...good..

Now I want you to focus your attention on your **arms**, whether they're lying alongside of you, or lying on the floor on your lap, whatever...put your **hand**, palm down, on the surface...of your thigh or on the floor...and slowly press the fingertips into the surface

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Drawing them towards your palm so that your hand gradually takes on the shape of a spider...don't force the movement, just put a medium amount of force into it....now as you hold the position...notice the tensions in the hand and the underside of the forearm... Hold the position...feel the tension build up...then relax...let the tension go...relax the muscles...let the tension disappear, and go on disappearing, as you give the hand time to get more and more relaxed...notice how it feels when it's fully relaxed...now still on arms, I want you to take both your arms and tense up all the muscles until the arm becomes completely rigid...begin with a little tension in the fingertips...until they start curling a little bit, and let it grow until the fingers are drawn into the palm, making a fist shape...then stretch out the arm, creating tension in the forearm and the upper arm until the arm gets rigid like a rod...like a stiff board...good....now feel the tension throughout the arm... don't overdo it ...hold it...and ...relax...let it flop down...feel the muscles going slack, and the arm going limp...notice the relief, the pleasant tingling and the sense of warmth...let the arm go on relaxing, and relaxing, a bit more...imagine the last remnant of tension just fading away...just flowing out of the arm...all the tension just flowing our of your fingertips...good...

Now turn your attention to your **legs** ...they're lying flat on the ground...what you do is focus your attention on your thighs and your buttocks... just tense them, so that your muscles contract and you are slightly lifted up off the ground...now hold that....now feel the tension...notice the sensations...then...relax...relax the muscles...feel yourself move closer to the floor...feel the tension just fading away in your thighs...

Now focus on your thighs...your quadriceps...just tense them...feel your knees just move up towards your thighs....feel the muscles contract...hold that.... Hold the position, notice the sensations....now relax...let go the leg muscles...again feel the tension draining out of them... and it continues to drain out as your legs become more and more relaxed...

Move down the legs now to the **feet** and the **calves**....go ahead and flex your feet...and see if you can get them pointing up towards your face...keep the backs of your knees on the ground... now hold that position ...again, feel the sensations of muscles that are working...hold it...and relax...relaxing the leg muscles, feeling the tension flowing right out of them...good...Now this time, I'd like you to point your feet down, as if you were using them to indicate something, or to point at something...don't overdo it, you don't want to have a cramp...hold the position...now study the tension that is in your calves... Feel that...muscles contracted...the tension...then relax...let it go ...let all the tension just dissolve...feel the comfort returning to your lower legs...notice all the sensations you get from relaxing the muscles...now continue letting go until you feel they won't relax any further...good...good...

Now your feeling totally **relaxed, yet energized** at the same time ...calm... relaxed.... energized...in control...completely relaxed...energized...Picture yourself all alone on the beach...it's a perfect day...big, fluffy white clouds overhead...perfect temperature, not too hot, not too cold...the sun just warms you...a gentle breeze lightly caresses your skin....warm ocean water...beautiful, pure turquoise blue just laps at your feet...just

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warm enough so that it feels perfectly comfortable...completely relaxed, energized... calm...in control...the perfect day....

Now. I'm going to bring the relaxation session to an end...I'd like you gradually, once again, to become aware of... the room...of ...the pressure of your body on the floor... and the back support ...feel the floor underneath you...feel your back touching the wall...take a deep breath and let it out...gradually start to open your eyes...give your arms a gentle shake... do the same with your legs... a nice, easy, shake. You have the feeling that you are completely alert, relaxed, energized, and in control... Ready to get up and get on with whatever it is that you need to do.

The End

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APPENDIX I:

IMAGERY SCRIPT

I Imagery Session 2: Rationale
(1) cue controlled relaxation
(2) associate a relaxed, energized state with cue words-**energized and relaxed-**

II Review homework
(1)go head to toes concentrating on only relaxation with the energized and relaxed cue words, in the same format as the first session, minus the tension component.

"Today we are going to add the swim specific imagery component to our exercises. We will start with the relaxation component of last weeks' Progressive Muscular Relaxation, skipping the tension section. We will do about 12 seconds of relaxation for each body part."

"If anyone is hurt, has a back problem, injured wrist, knee, anything at all—adjust your position as needed so you are comfortable.... OK...get into a comfortable sitting position, legs straight out ahead of you, back supported against a wall or other vertical surface. We'll start at the head, and go down to the toes. "

"Let's begin with sinking:"

Sinking:

Close your eyes....Make yourself as comfortable as you can...become aware of the surface underneath you...let your body settle into it...notice how it supports you...notice the points of contact between you and the floor or wall:...your head...shoulders...spine... ribs... hips... backs of your legs...heels...elbows...forearms and hands...feel your body sinking into the surface you are sitting on....Take a good deep breath starting from your abdomen...feel your shoulders rise as your lungs fill with air... hold it for a brief moment, then as you let it out, feel it take your tensions away...let your breathing settle into a gentle rhythm...

"We start with the **head**... Now...notice the feelings you get from the working muscles... the back of the **neck**....and ...relax...let go...feel the area relax....be aware the sense of ease that flows into the area...allow the relaxation to deepen ...
Now moving to the face... Moving to the many muscles responsible for subtle changes of expression ...notice the muscles working in your forehead...and ...relax...let the relaxation flow in... Now...be aware of your frowning muscle....the area around the eyebrows ...for a few moments, taking notice of the sensation there... then relax...feel the eyebrows relax and spread sideways...imagine the space between them get wider and continue to get wider...notice the comfortable feeling that accompanies this idea...

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Now we come to the eyes... notice the sensations in this area... now just spend a moment registering that....and relax, let it go...feel the muscles around the eye loosening up...notice the feeling you get from loosening them...feel the skin smoothing out...now, without moving the head, turn your eyes upwards behind your closed eyelids... bring your eyes back to a central position ...now look down as if towards your feet... now return to the center...now look to the right...keep it steady....then return to the front...now to the left.... then bring your eyes back to the front, and relax...let your eyes feel relaxed...now their resting in the middle position... continue just relaxing your eyes...now roll your eyes in a clockwise circle.... Notice the sensations... pause...now roll them in a counterclockwise direction...notice the feelings of muscles working....and .....relax.....bring them back to center and let them fully relax....go on relaxing ...

Now we go on to the **jaw**... feel an awareness of your jaw muscles ...then relax...release the tension from the jaw muscles...fell the tension fading....continuing to fade...and further still...just fading out...Now you **lips**... notice feelings of breath moving over your lips... now relax the lip area ...let it go...

Now the **Tongue**...be aware of your tongue, the sensation of your tongue in your mouth ...there...that's it ...and relax...notice how it feels when you relax it... move your tongue to the right ...then the left.....let your tongue settle in the middle of your mouth, just touching the backs of your front teeth...feel it releasing tension...let it go on relaxing...enjoying the feeling of relaxation...let that feeling spread throughout your mouth and over your face....making it feel warm, glowing and relaxed...then let it spread to cover your neck and shoulders...

Now , moving back to your **neck**, and **shoulders...** I 'd like you to be aware of them rising and falling with your breath....and relax...let the shoulders drop...let them go on dropping...further ...and further...and further... as the tension just ebbs away... feel your shoulders completely relaxed.... Now moving to the region of the **back**, bring your attention to the shoulder blade bones just behind your shoulders... feel your back pressing once again in contact with the supporting surface...nice and easy... notice the muscles, a feeling of relaxation starting in your back and spreading... and let that feeling continue on and on...good.. ...let your muscles soften up

Now the **abdominal** muscles... feel the rise and fall of the abdomen as you breathe... relax... let go...allow your muscles just to spread themselves out...feel a sense of deep relaxation, and let that relaxation become deeper as the moments pass...

Turn your attention to your **breathing** again...notice it's rhythm... place one hand over your upper abdomen, and notice the gentle swell and recoil of the area underneath it....the rise and fall...the in and the out of the abdomen ...and the breath working naturally together without any effort...avoid any inclination to alter the rhythm, just let the breathing take care of itself...nice and easy , a natural rhythm...good..

Now I want you to focus your attention on your **arms**, whether they're lying alongside of you, or lying on the floor on your lap, whatever... don't force your awareness, just let it grow ....notice any tensions in the hand and the rest of the arm.....then relax...let the tension go...relax the muscles...let the tension disappear, and go on disappearing, as you

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give the arm time to get more and more relaxed...notice how it feels when it's fully relaxed... let the arm go on relaxing, and relaxing, a bit more...imagine the last remnant of tension just fading away...just flowing out of the arm...all the tension just flowing our of your fingertips...good...

Now turn your attention to your **legs** ...they're lying flat on the ground...what you do is focus your attention on your thighs and your buttocks... notice the sensations of your muscles in contact with the floor...then...relax...relax the muscles...feel yourself move closer to the floor...feel the tension just fading away in your thighs...
Now focus on your thighs...your quadriceps... be aware of the contact points of your legs with the floor....feel the muscles ...Be aware of the position, notice the sensations....now relax...let the leg muscles go ...again feel the tension draining out of them... and it continues to drain out as your legs become more and more relaxed...

Move down the legs now to the **feet** and the **calves ....** again, feel the sensations of muscles ...now relax...relaxing the muscles of the feet and the calves, feeling the tension flowing right out of them...good... let all the tension just dissolve...feel the comfort returning to your lower legs...notice all the sensations you get from relaxing the muscles...now continue letting go until you feel they won't relax any further...
good...good...

Now your feeling totally relaxed, yet energized at the same time ...calm... relaxed....
energized...in control...completely relaxed...energized...

III Transition

(1) instead of beach scene, go to performance scene, with the same feeling of relaxation- the perfect swim-by increments of 25%

pre-swim- imagine it's 10 minutes before your swim...your prepping for your race....you're surrounded by your teammates...all NCAA Division 1 athletes...each has qualities you admire...you're proud to be part of this team... a teammate glances at you...says today's your day...you know it's true...you feel it....you're totally prepared...It's race time, and you love it...You're can't be denied...you're a force today...You're focusing on the race... totally energized and calm...maintaining your focus...You love this...this is what it's all about....You're so prepared....a feeling of happiness starts to warm you up...You cherish this moment...this is why you do what you do...today is your day....you're totally prepared.... you notice the opposition...they means nothing to you... present or not, it doesn't matter to you... You've rehearsed this...you notice your teammates... your coaches... your friends...you feel their support... it energizes you... soak it up like a sponge... everyone else is irrelevant...
....You're in complete control....your body is so well trained you can feel it warming up on it's own... like a machine you're on cruise control... it knows what to do...you walk to the blocks at your own pace...with every step you grow more sure...more confident... more powerful.... you touch the blocks.... you get a surge of adrenaline...you decide to ride the wave...you're calm...energized...relaxed.... focused....and powerful.... you know it's your day ...you adjust my goggles... they fit just the way you like

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'em....perfect....you shrug your shoulders...you feel awesome ....you shake your legs...shake your arms...with every shake, you feel the energy just flow into your muscles...energized, relaxed ...all the preparation is kicking in...the switch is on.... You're focused on my race.... you're in your element....you're ready to dominate....

start and first 15-25% of swim

you're coiled, ready to spring, waiting for the start.... your muscles, like deep springs, ready to unleash their energy.... You have an explosive start... generating effortless power that springs from your own deep well.... you feel like the water is just parting for you and you slide through it effortlessly...you settle into your flow... easily.... naturally.... quickly.... As you go into your first turn you feel yourself accelerate into the wall and out of the turn...clean, sure, good explosive thrust, feeling slick off the wall each time.... You're exactly where you want to be, doing exactly what you want to do.... your technique just happens, just part of you...you're dancing.... Clean...on...it's all working for you....barracuda quick...you know your technique gives me an edge...effortless transitions

50% of swim

Now imagine yourself ½ of the way through the swim...you're aware of other swimmers... they don't matter to you... you're exactly you want to be...you're on target....you've prepared for this....you feel as if your energy is increasing...you're swimming the race you want to swim.... Energized, relaxed... in control... it's all working together for you...total flow state....

It's your race... I'm doing it... your focus is like a laser... the water is splitting in front of you.... Still energized....perfect rhythm...right on plan...you've worked hard for this...when the turns come up, you attack...accelerating in...exploding out.....technique feels so clean.....you're totally efficient.....

75%-

Now still energized... right on plan... you've worked hard for this...it doesn't matter who's where doing what...you're right on track for where you want to be ....when you turn, you're attacking the turns even stronger , accelerating into and out of the wall... perfect rhythm on your stroke...maintaining your pace...your technique feels so clean... your totally efficient.... feels like you can go all day.... flow...easy...natural.... it's your day...

finish-

plenty in the tank left for final push... you're driving towards the finish.... The wall is pulling you in like 10 rubberbands hooked together ...you're superbly conditioned.... you feel like you could swim right through the finish.... It's coming up...driving through it....touching through the wall...perfect finish....you put it all out...you did exactly what you wanted....no one else's times matter...you did exactly what you wanted to do.... Awesome job.

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AFTER

you climb out of the pool...you can feel you gave it everything....you walk towards the warm down pool...and all you can think of are the things you did right.... You're feeling so excellent... proud...as you walk by, a teammate smiles and says "Awesome race...you were **heroic**....you can't help but grin...happy with the effort you put out...excited with what you just learned about yourself and your racing....happy with the knowledge **you are able to go to the personal place and** bring it all out....feel an inner peace and contentment....As you swim down, you realize you're able to call on that feeling of being relaxed... energized...sharply focused.....whenever you want... you feel sure...confident...

....you realize you can do this anytime you want...you made it your own....made it work for you.....you're feeling good about your team...about your contribution....yeah, this is good....you brought this feeling on yourself...you own it... you control it....It's yours...you think it...and it happens...you realize that these are the moments you cherish...

The End

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VITA

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