2000

The use of imagery to optimize anxiety levels in female intercollegiate water polo players

Danielle Marcelle Altman

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THE USE OF IMAGERY TO OPTIMIZE ANXIETY LEVELS
IN FEMALE INTERCOLLEGIATE WATER POLO PLAYERS

A Project
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
Of the Requirements for the Degree
Master of Arts
in
Education:
Kinesiology

By
Danielle Marcelle Altman
June 2000
THE USE OF IMAGERY TO OPTIMIZE ANXIETY LEVELS
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Chris Grenfell, First Reader

A. I. Clifford Singh, Second Reader
ABSTRACT

It has been shown that imagery training and visualization techniques can be used as an effective intervention for controlling levels of pre-competitive state anxiety. A review of literature was done to examine the relationship between anxiety, imagery, and competitive performance. Subsequently, a study was conducted in which ten female intercollegiate water polo players completed a pre-imagery questionnaire and the Sport Competition Anxiety Test (SCAT) before beginning an imagery training program. Imagery sessions were then conducted prior to 18 competitive events, using the Competitive State Anxiety Inventory (CSAI-2) to measure pre- and post-imagery competitive state anxiety (cognitive and somatic) and state self-confidence levels. Raw scores were computed and the results showed that individual trait anxiety scores were an indicator for pre-imagery state anxiety scores. In addition, the use of imagery was associated with a decrease in team somatic and cognitive pre-competitive state anxiety. Post-imagery training scores showed that individual and team state self-
confidence levels also improved. Team performance improved to some degree and the average individual performance also showed some positive change. These results indicate that imagery intervention may be used to help optimize levels of pre-competitive state anxiety and self-confidence, while improving performance in competitive water polo.
ACKNOWLEDGMENTS

I would like to thank my water polo team for their participation and cooperation with this project. I would also like to thank Dr. Robert Rinehart for help with all of the little things and Dr. Cliff Singh for all of the encouragement and help he gave throughout. Most importantly, I would like to thank Dr. Chris Grenfell, whose support and feedback during this process was invaluable.
Dedication

To my parents: Dennis and Luella.

With love and thanks for their support of all of my academic endeavors.
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CHAPTER I
DEFINITIONS

"Coach, why do I have these butterflies in my stomach?" Right before competition, one of my players asked me this question. Having had those same feelings during my competitive years, my standard answer was;

"You are nervous about the game."

Looking more closely at the situation, I came to realize that almost every player on my team had some sort of "nervous energy" before game time. I also observed that each player dealt with their feelings a little differently. Some players just shut themselves off from everything. Normally loud and happy, these women would cease to talk and to communicate with their teammates. Others felt and even looked ill, and complained of being sick to their stomachs. Still others became extroverts, and told me frankly, "I feel nervous." I became interested in the varying degrees and manifestations of this anxiety that I was observing in my players. And on a practical level, how could I channel this "nervous energy" to optimize their performance? These questions recurred during my first year coaching women's water polo
at California State University, San Bernardino. My team was not in contention for a championship, yet the players' anxiety was something that held my interest.

I came to learn that my players, along with many competitive athletes, experience heightened anxiety levels before competition (Hackfort & Spielberger, 1989; Martens, 1977; Martens, Vealey, & Burton, 1990). Anxiety, a uni-dimensional aspect of arousal, can have extremely negative effects on athletes during competition (Hackfort & Spielberger, 1989). I noticed that after the first quarter of play, my athletes showed fewer signs of anxiety in games that were one sided. However, in close game situations, particularly in the remaining minutes of the fourth quarter, heightened anxiety levels would again be apparent in many of my athletes.

My team would not be considered a "get-going-from-the-start" team, nor were we particularly great finishers in the close-game situations. This could stem from a variety of reasons, which include age, lack of game-time experience, skill, and various issues with personality and confidence levels. I determined that my team suffered from what I will call "first-quarter brain defrost" (pre-
competitive anxiety) and "close-game brain death" (over-arousal in competition). What I mean by "first-quarter brain defrost" is that in the first quarter it would take some time for my players to become comfortable performing, even when using basic fundamental skills that we have practiced hundreds of times.

"Close-game brain death" would imply that in close game situations, my players would make an unusual amounts or types of mistakes due to over-arousal in competition. For example, one of my players may miss a "free" four-meter shot that would tie the game. This is a shot that she made every other time in non-close game matches. Rather than trying to affect all the variables that may account for my team's performance during these particular game times that cannot be controlled nor changed, I opted to work on one specific area that I felt could be changed and improved; namely, player anxiety levels. Sport psychology research shows clearly that reducing anxiety levels is important in improving performance (Weinberg & Gould, 1995). Anxiety levels, while they vary from player to player, may be the cause of the slow start in the first quarter and the increased mistakes made in close-
game situations. I chose to use imagery and visualization as my tools for reducing anxiety levels, as it can easily be done with the whole team before games, thus becoming "routine". By using game-specific and situation-specific imagery and visualization techniques, I hoped to reduce anxiety levels in my athletes thereby improving performance in both the early-game (first-quarter) and in close-game (fourth-quarter) situations.

STATEMENT OF PROBLEM

Many CSUSB women water polo players present a heightened cognitive and somatic state anxiety levels prior to intercollegiate water polo games. It is anticipated that an intervention of imagery and visualization techniques may have positive effects upon early-game (first-quarter) and close-game (fourth-quarter) performance.

HYPOTHESIS

The use of fundamental skill and game imagery techniques on female collegiate water polo players will result in (1) the reduction of anxiety levels and (2) improved performance, as measured by personal game statistics.
DEFINITIONS

Arousal

Arousal can explain the emotional states of athletes. Arousal is considered to be a "general physiological and psychological activation of the organism (person) that varies on a continuum from deep sleep to intense excitement" (Gould & Krane, 1992, pp. 120-121). Arousal "refers to the intensity dimension of behavior" and the continuum ranges from no arousal (deep sleep) to high arousal (intense excitement) (Martens, Vealey, & Burton, 1990, p. 6). An individual who is highly aroused can have many symptoms, such as an increased heart rate, sweaty palms, or shaking. High levels of arousal can occur from a range of events, both positive and negative.

Stress

Stress is an emotional state in which an individual may feel overwhelmed or pushed by a certain situation. It is "the process that involves the perception of a substantial imbalance between environmental demands and response capabilities under conditions in which failure to meet demands is perceived as having important
consequences and is responded to with increased levels of cognitive and somatic A-state (Martens, Vealey, & Burton, 1990).

Stress is a complex process that involves three major elements: stressors (situations or circumstances), perceptions or appraisals of danger (threat), and emotional reactions (anxiety). These include stressors, which are used to describe the situation or circumstance characterized by "some degree of objective physical or psychological danger" (Hackfort & Spielberger, 1989, p. 4). Stressors are the situations or circumstances that have some degree of potential or immediate danger. Whether or not there is any objective danger, if the stressor is perceived to be dangerous then an "emotional reaction" occurs such as anxiety (Hackfort & Spielberger, 1989, p. 4).

**Threat**

Threat is the second element involved in the complex process of stress. Threat is something that is sensed by an individual about a given situation. According to Martens, Vealey, and Burton (1990) "threat is the perception of physical or psychological danger. It is
perception of an imbalance between environmental demands and response capability" (p. 10). The degree to which an individual finds a situation threatening, determines the reaction to the particular stressor. In most cases, threat is seen objectively and realistically where actual dangerous situations are perceived as dangerous. However, other variables may be involved, such as memories, coping skills, and thoughts, that when stimulated by certain situations, may make one person seem very threatened while the same situation would have no effect on another person.

It is a "state of mind" to experience threat, which involves two main characteristics (Hackfort & Spielberger, 1989, p. 5). The first characteristic takes place in a futuristic format, meaning that the individual is anticipating the potentially dangerous event before it even occurs. The second characteristic of the experience of threat is that "it is mediated by complex mental processes, i.e., perception, thought memory, and judgment, which are involved in the appraisal process" (Hackfort & Spielberger, 1989, p. 5). To appraise a threatening situation, whether in the present or future,
is an important step in bringing out the emotional reactions that lead a person to take action. According to Hackfort and Spielberger (1989), even in a situation void of danger, if the individual perceives or appraises threat in that given situation, the message of "stress" is sent and the result is the arousal of A-state.

Anxiety

Anxiety is an innate and/or situational reaction to certain stimuli. Anxiety is considered to be a negative construct of arousal. According to Hackfort and Spielberger (1989), "anxiety states are characterized by subjective, consciously perceived feelings of apprehension and tension, accompanied by or associated with activation or arousal of the autonomic nervous system" (p. 4).

State-Anxiety

State anxiety is the emotional reaction to certain situations, circumstances, and stress. "State anxiety (A-state) is an existing or current emotional state characterized by feelings of apprehension and tension and associated with activation of the organism. State anxiety is linked with negative effect" (Martens, Vealey &
Burton, 1990, p. 9). A-state is anxiety that is constantly changing depending on changing stimuli, variables, and situations. A-state is associated with the arousal of the body and is linked to the feelings of worry, apprehension, and nervousness that are experienced by many people (Weinberg & Gould, 1995).

When an individual perceives a situation as threatening, there is a process that occurs. First, an A-state reaction will take place. Then, depending on the degree of threat perceived by the individual, the reaction can range from moderate to intense. Last, A-state will remain aroused until the situation is no longer considered threatening (Hackfort & Spielberger, 1989; Martens, Vealey, & Burton, 1990).

**Trait-Anxiety**

Trait anxiety (A-trait) is anxiety that is directly linked to the personality of the individual. It is a "predisposition to perceive certain environmental stimuli as threatening or non-threatening and respond to these stimuli with varying levels of A-state" (Martens, Vealey, & Burton, 1990, p. 9). High A-trait would indicate that the individual would respond to a threatening situation
with greater levels of A-state and/or “perceive more situations as threatening” (Martens, Vealey, & Burton, 1990, p. 5)

A-trait is anxiety that is unchanging, unless certain “stimuli” triggers the A-state (Martens, Vealey, Burton, 1990, p. 5-6). It is a part of a person’s existing personality, and is an “acquired behavioral tendency or disposition that influences behavior” (Weinberg & Gould, 1995). This indicates that two athletes put in the same exact situation could potentially react in two completely different manners. The A-state reactions would vary between the two athletes due to the difference in A-trait levels.

**Competitive Anxiety**

This describes the anxiety that is experienced by an athlete prior to and during competitive event or game. Competitive anxiety can be divided into two categories: trait and state.

**Competitive Trait-Anxiety**

Competitive trait anxiety is considered to be a “situation-specific modification of the more general A-trait construct.” It is defined as “a tendency to
perceive competitive situations as threatening and to respond to these situations with A-state." (Martens, Vealey, Burton, 1990, p. 11) Understanding competitive A-trait is helpful in understanding both behavior in sport and "which competitive situations are perceived as threatening and how persons respond to threat". (Martens, Vealey, Burton, 1990, p. 11)

**Competitive State-Anxiety**

Competitive state anxiety is directly related to competitive trait anxiety. There is a positive relationship between cognitive and somatic A-state and competitive trait anxiety (Martens, Vealey, Burton, p. 194). The level of competitive A-trait will determine the level of A-state experienced by an athlete.

**Cognitive Anxiety**

Cognitive anxiety is often determined by thoughts and memories. It is "the mental component of anxiety caused by negative expectations about success or by negative self-evaluation" (Martens, Vealey, & Burton, 1990, p. 9). Cognitive anxiety is characterized by "conscious awareness of unpleasant feelings about oneself
or external stimuli, worry, (and) disturbing visual images (Morris, Davis, Hutchings, 1981, p. 547).

According to Martens, Vealey, and Burton (1990), cognitive A-state in sport "is most commonly manifested in negative expectations about performance and thus negative self-evaluation" which results in both promoting worry and "disturbing visual images" by athletes (p. 9). Cognitive anxiety describes the changes in the levels of worries or negative thought that occur from moment to moment.

**Somatic Anxiety**

Somatic anxiety is the physical aspect of anxiety, and is often the type of anxiety that is easiest to recognize. It "refers to the physiological and affective elements of the anxiety experience that develop directly from autonomic arousal. Somatic anxiety is reflected in such responses as rapid heart rate, shortness of breath, clammy hands, butterflies in the stomach, and tense muscles" (Martens, Vealey, & Burton, 1990, p. 9-10). Somatic anxiety is a result of stress rather than a change in activity. It describes the changes in
"perceived physiological activation" that occurs from moment to moment (Weinberg & Gould, 1995).

**Imagery**

Imagery refers to the cognitive process used by individuals to visualize a given situation or event. Imagery can be defined as "creating or recreating an experience in the mind" (Weinberg & Gould, 1995, p. 280). Imagery can be used to recreate a past experience through memory. It is "experienced internally by recalling and reconstructing previous events" (Weinberg & Gould, 1995, p. 280). The mind is able to "remember events and recreate pictures and feelings of them" (Weinberg & Gould, 1995, p. 280). Imagery can also be used to create a situation or event that has not previously occurred using images built upon various parts of memory (Porter & Foster, 1990; Vealey, 1986; Weinberg & Gould, 1995).

Imagery is an experience that occurs completely in the mental process, however; it can be compared to real sensory experience such as feeling, hearing, or seeing (Orlick, 1986; Porter & Foster; 1990; Vealey, 1986). For many researchers, imagery is synonymous with many phrases such as visualization, mental rehearsal, and mental
preparation. For athletes it can be used as a type of mental preparation for competition, rehabilitation, and coping skills (Orlick, 1990; Porter & Foster, 1990).

Imagery is an acquired skill that requires a certain amount of practice to do effectively. Imagery has the potential to transfer the experience to actual performance (Weinberg & Gould, 1995). There are several ways that imagery can be used to improve both the physical and mental skills of an athlete. This may include, but is not limited to, building confidence, controlling emotional responses to certain situations, improving concentration, and practicing certain sports skills.

**External Imagery**

External imagery is imagery where the individual views herself from "the perspective of an external observer" (Mahoney & Avener, 1977, p. 137). This is much the same as watching a home movie, for example. For this type of imagery, the athlete who is imaging herself performing a skill would see the entire picture. For example, a water polo player watching herself shoot the ball would see the goal, the goalie, and the other
players in the pool. External imagery does not involve much of the kinesthetic sensory movement.

**Internal Imagery**

Internal imagery is defined as a process that "requires an approximation of the real-life phenomenology, such that the person actually imagines being inside his/her body and experiencing those sensations that might be expected in the actual situation" (Mahoney and Avener, 1977, p. 137). The task is imagined as if it were actually being performed, so the athlete would only see what she could when physically performing the task. Due to this first person perspective, athletes would be able to better imagine the feel of the movement.

Internal imagery involves more senses to create a vivid image. For example, a water polo player who is passing under pressure normally has her back to the offense. She would only be able to see the ball and her goalie, but she would be able to feel the defender hanging on her, hear the defender breathing in her ear, hear the shouts of her teammates, and feel the grip of
the ball and the water splashing in her face during imagery practice.

**Skill-Specific Imagery**

This can be defined as the imagery technique used to visualize the process of performing a certain skill. Hall Mack, Paivio, & Hausenblas (1998) indicate that this is "cognitive-specific" imagery defined as "imagery of specific sport-skills" (p. 78). The individual should imagine doing the skill with perfect execution and technique. The more senses involved in mentally performing the skill, the more effective the imagery practice becomes on actual physical performance. For example, a water polo player may visualize herself making the perfect pass while being pressured by a defender. She can see herself holding the ball while feeling the defender leaning on her at the same time she hears the defender breathing in her ear coupled with the shouts of her teammates in the pool (Hall et al., 1998; Orlick, 1986; Porter & Foster, 1990).

**Game-Specific Imagery**

This is the technique where several types of imagery are combined to visualize all or part of an event. Hall
et al. (1998) refer to this type of imagery as "cognitive-general" and define it as "imagery of the strategies related to a competitive event" (p. 79). The visualization would begin mentally picturing the start of the potential game, and then run through certain game situations that may involve the whole team. The specific skills that need to be used in the given situations would also be visualized. For example, a basketball player may visualize his whole team on the court being defended by the opponent they will play the next day. He would then see his team run a successful offense, score and immediately do a full-court press. Game-specific imagery is used to help a team or individual performer visualize the situations that are likely to occur in competition (Sugarman, 1999).

**Motivational-Specific Imagery**

This type of imagery is defined as "imagery that represents specific goals and goal-oriented behaviors" (Hall et al., 1998, p. 79). An athlete may imagine herself winning an event, or receiving an award for the event. Motivational-specific imagery is used to help
individual athletes help to realize specific goals for
sport competition.

**Motivational General-Mastery Imagery**

Motivational general-mastery imagery is imagery that
"represents effective coping and mastery of challenging
situations" (Hall et al., 1998, p. 80). For example, an
athlete could imagine herself being mentally tough,
confident, and focused during a competitive event. This
can help athlete to prepare for competition by helping to
establish how the athlete will feel during sports
competition.

**Motivational General-Arousal Imagery**

This is imagery that can help to represent "feelings
of relaxation, stress, arousal, and anxiety" that may
occur during sports competition (Hall et al., 1998, p.
81). For example, an athlete who feels tense before the
start of competition, can use this type of imagery to
help feel relaxed. Or, an athlete who is nervous during
close-match situations, can visualize these feelings to
help prepare for such situations in competition.
Emotional Image

An emotional image is defined by Lang (1977) as “a functionally organized, finite set of propositions” (p. 864). There are two classes of emotional imagery. The first is stimulus propositions, which “describes the scenario to be imagined” (Bakker, Boschker, & Chung, 1996, p. 314). A few examples are the specific details of a situation or an object, the presence or absence of observers, the object movement, or the physical location of the event being imagined. This can be compared to external imagery.

The second class is the response propositions. Response propositions “contain assertions about behavior, such as verbal responses (cries), somatomotor events (muscle tension), and visceral events (heart rate, palmar sweat)” (Bakker, Boschker, & Chung, 1996, p. 314). Response propositions tend to result in more vivid images since they are usually accompanied by increased physiological response when compared with imagery using only stimuli propositions. Response propositions tend to involve increasing amounts of sensory involvement during
the imagery practice, and can be compared to the effects of internal imagery.

**Performance**

Performance is defined in this study as the athlete's positive or negative actions in a competitive event. The athlete who has a good performance will play and portray skills on the positive spectrum of game statistics. The athlete who has a poor performance will play and portray skills on the negative spectrum of game statistics. Game statistics are used to quantify performance, thus an athlete can have both positive and negative actions in a competition that are not reflected on game statistics.

**OPERATIONALIZED DEFINITIONS**

**Anxiety**

Anxiety will be measured by using the Sports Competition Anxiety Test (SCAT) and the Competitive State Anxiety Inventory (CSAI-2) (see Appendices A and B, respectively). Trait anxiety and state anxiety will be describes as either high, medium or low, depending on the results of the tests.
Trait-Anxiety

The Sport Competition Anxiety Test for Adults (SCAT-A) will be used to measure trait anxiety. The SCAT-A is used to determine how a person generally feels about sports and competition (Martens, 1977; Martens, Vealey, & Burton, 1990). The SCAT was presented to the subjects as the California Competition Questionnaire, in order to minimize biased responses. The SCAT-A consists of fifteen questions, with three possible responses: Hardly Ever (A), Sometimes (B), and Often (C). Ten questions are legitimate anxiety items, and five additional spurious questions were added as another way to avoid biased responses.

The SCAT should be administered with instructions reiterating that responses should be based upon how one generally feels about sports and competition. In addition, it has been shown that “anti-social desirability instructions” have helped improve response bias with this type of questionnaire (Martens, 1977; Martens, Vealey, & Burton, 1990, p. 52)
Pre-Competitive State-Anxiety

The Competitive State Anxiety Inventory - 2 (CSAI-2) will be used to measure pre-competitive state anxiety before and after imagery intervention. Administration of the CSAI-2 will measure the subject’s pre-competitive state-anxiety. The inventory is used to measure the "existing states of cognitive A-state, somatic A-state, and state self-confidence in competitive situations" (Martens, Vealey, & Burton, 1990, p. 175). It is advised that the administration of the CSAI-2 be done as close to competition as possible, no more than one hour before the event. The inventory was administered with the title of "California Self-Evaluation Questionnaire", in an effort to avoid biased responses. In addition, the "anti-social desirability instructions" are administered to avoid biased responses. Subjects are not required to put their name on the questionnaire. Anonymity may help to reduce the level of bias. However, for this study subjects did put a "subject number" on the inventory.

It was ensured that the subjects understood the directions, and that the answers to the inventory should be based on how they felt in that moment.
Performance

The standard CSUSB team statistic sheet was used (see Appendix C). The difference between the positive statistical performance and negative statistical performance will determine if there was an improvement in individual and team performance. Statistics will be measured on a three-point scale: Positive performance will be considered statistics that are greater than or equal to 2, marginal performance will be considered less than +2 and greater than −2. Poor performance will be considered less than or equal to −2. If no statistics were obtained for a particular game, then the score will be neutral.

In order to measure individual performance, three “duplicate” games (three games from the first half of the season compared to three games from the second half of the season against the same opponent) will be measured using the three-point scale.

To measure team performance, 10 randomly selected games of the first part of the season will be totaled and compared to the 10 games randomly selected from the second part of the season.
Imagery

Water Polo Questionnaire Form A (see Appendix D) was used to determine the background and experience level in competition of my subjects. The questionnaire included yes/no questions, multiple choice, and short answer and was devised to determine the variables that may alternatively affect the results of the imagery training.

Water Polo Questionnaire Form B (see Appendix E) was devised to determine the results of the imagery training. The subjects were administered the questionnaire after the last competition of the season. The form was used to determine if the subjects felt the imagery training was effective for them.

CONCLUSION

These definitions are provided as a background of information for the following quasi-experiment. Each term discussed above will be used continuously throughout this paper. The operationalized definitions were provided as information on how anxiety, imagery, and performance will be assessed in the study.
CHAPTER II

LITERATURE REVIEW

"As it is in most aspects of life, anxiety is present in sport... Each time man 'takes the field,' he not only lives with anxiety, he embraces it. It allows him and, in fact, motivates him, towards greater realization of his skill in the contest... Sport encourages man to live with anxieties..." (Slusher, 1967, p. 192 as cited by Spielberger, 1989, p. 3)

There have been many questions posed by researchers regarding anxiety in sports competition. Why is it that some athletes can "rise to the occasion" in competition while others "choke under pressure"? It is difficult to deny that what is in the athlete's mind at the time of competition can ultimately determine the difference between success and failure. The role of anxiety in sports has resulted in a growing body of research conducted by sports psychologists in the past twenty years (Hackfort & Spielberger, 1989).

The state-trait distinction with anxiety has greatly improved research in competition anxiety studies. Recognizing the differences in an athlete's innate qualities - such as personality - and the
athlete's response to a particular situation (state of mind), has changed how anxiety levels have been evaluated. It has been shown that there is a direct relationship between the level of an athlete's trait anxiety with the level of state anxiety that may be experienced (Hackfort & Spielberger, 1989; Martens, Vealey, and Burton, 1990). The relationship is not perfect. There are many variables that can affect this relationship, such as the athlete's experience in the given situation. However, knowing an athlete's trait anxiety has served as a predictor for state anxiety. It can often determine how the athlete will react to a competition or other threatening condition (Martens, Vealey, & Burton, 1990; Spielberger, 1989).

The assessment of both trait and state anxiety in sport has been developed in various forms of self-evaluative inventories. The Sports Competition Anxiety Test was developed by Martens (1977) to serve as an indicator of trait anxiety. State anxiety has also been assessed in many ways. The Sports Anxiety Inventory (SAI) was developed by Spielberger (1989). This was used to test state anxiety in sports. This was followed by
the Competitive State Anxiety Inventory (CSAI) developed by Martens (1977). The CSAI was adapted from Spielberger’s SAI, to measure competitive anxiety versus sports anxiety. These are commonly used measures of state anxiety in research.

Competitive anxiety is considered to be on the negative end of the arousal continuum. Athletes who suffer from anxiety are overly-aroused, which can inhibit performance (Weinberg & Gould, 1995). Athletes can have optimal levels of arousal during competition; however, excessive arousal can negatively affect performance. Since anxiety levels can negatively affect an athlete’s performance, much attention is focused on optimizing arousal levels. There are many types of interventions that have been used to optimize arousal levels. Mental training is one type of intervention that is often used by athletes to improve performance. It has been noted, that when two athletes have equal ability, the one with the “mental edge” would more often than not emerge as the winner (Porter & Foster, 1990, p. 3). In an age where athletes are constantly looking for an edge
during competition, mental development has become increasingly important.

An athlete spends a vast amount of time training the body, but often there is no training of the mind. However, like the body, the mind must be trained in preparation for competition. It has been shown that daily mental practice has aided athletes prepare "for all possibilities and helps him or her cope positively with the unexpected, rather than getting psyched out" (Porter & Foster, 1990, p. 3). Using the skills developed through mental practice, an athlete has the ability to establish a positive state of mind before, during, and after competition. Mental training enables the athlete to have an increased amount of personal control in the competitive event. Therefore, mental training could positively affect an athlete's performance.

Mental powers and state of mind have both positive and negative effort. Thus, it is important that the athlete learns to promote the positive mental skills over the negative. High levels of state anxiety represent the negative aspects of the "state of mind"
experienced by the athlete before, during, or after competition. Although competitive trait anxiety is difficult to modify, athletes can mentally train to give themselves an edge in competitive events by controlling how they feel before and during competition. Thus, mental practice may have a direct effect on anxiety levels of athletes.

There are many types of mental training such as; mental log keeping, goal setting, positive self-talk or affirmations, relaxation, imagery, and visualization. These techniques can be combined or used separately when developing a mental training program for an athlete. Imagery and visualization have been shown as effective ways to control many variables that can affect an athlete’s performance. These variables can be physical, emotional or both. Physically, the athlete can use imagery to improve motor and game skills and mentally, the athlete can use imagery to help control emotions such as anxiety (Weinberg & Gould, 1995).

This section includes a discussion of the arousal-performance relationship, and how this relationship may affect anxiety levels in athletes. Several theories
regarding this relationship are presented as well as other variables that may affect the relationship. A summary of various assessment techniques used to measure trait and state anxiety in athletes is provided, followed by a discussion of imagery and the theories regarding mental practice. Several studies are highlighted that have tested the effects of imagery on individuals in a variety of stressful situations. Last, there is an overview of strategies for establishing an effective individual imagery training program.

THE AROUSAL-PERFORMANCE RELATIONSHIP

The relationship between anxiety and performance is very complex. It stems from another complicated relationship involving arousal and performance. Because anxiety is usually considered to have a negative effect on arousal, understanding the arousal-performance relationship will help to understand why and how anxiety levels can affect performance. Arousal can affect performance in both a positive and negative manner (Weinberg & Gould, 1995). The level of mental arousal and physical arousal can be at optimal levels for some
athletes while for other athletes these levels can be too high or too low.

The first theory developed to explain the arousal and performance relationship is called the Drive Theory. The Drive Theory establishes the relationship as direct and linear (Spence & Spence, 1966; as cited by Weinberg & Gould, 1995). This implies that as an athlete's arousal or state anxiety increases, performance continuously improves. There is little corroboration for this theory, however (Weinberg & Gould, 1995). In many cases, athletes can become too aroused. These high levels of state anxiety can hinder the athlete's performance. There are many variables that make this theory difficult to support. For example, the theory does not account for the well-practiced skill, nor does it look at the difference in an athlete's experience level.

A second theory was developed to explain the arousal-performance relationship is known as the Inverted-U Hypothesis. This theory states that there is a curvilinear relationship between arousal and performance whereby the extreme highs and lows of an
individual's arousal levels are thought to impair performance and the moderate arousal levels can improve performance (Hackfort & Spielberger, 1989). Arousal levels at the low end of the curve are not sufficient enough to get an athlete ready to perform. From this point on, however, it is argued that arousal levels increase to an optimal point where performance is at its best. However, if arousal levels continue to increase, performance can decline. The inverted-U demonstrates that optimal arousal results in high performance, with the high and low levels of arousal indicating a decrement in performance.

The relationship between arousal and performance may be more complex than either of these theories may indicate since neither perspective takes into account such variables as task complexity and task difficulty. It is suggested that "optimal levels of arousal may be lower for more complex or more difficult athletic behaviors" (Hackfort & Spielberger, 1989, p. 79). An example given by Mahoney (1979) explains that there are simple tasks - such as weightlifting - where it is beneficial when optimal levels of arousal are very high.
These high levels of arousal help the individual perform the task. Conversely, cognitive tasks - such as putting in golf - require much lower levels of arousal. In fact, even moderate levels of arousal can negatively affect this type of cognitive skill.

The relevance of the relationship between arousal and task complexity has led to further research. Oxendine (1970) established several rules for this relationship. The first rule argues that gross motor skills involving strength, endurance, and speed require high levels of arousal for optimal performance. For tasks - such as complex skills, coordination, fine muscle movements, general concentration, and steadiness - performance is negatively affected by high levels of arousal. However, in general, for all motor tasks, a slightly elevated level of arousal is more beneficial to performance than is a normal to sub-normal state (Hackfort & Spielberger, 1989).

In addition, other individual differences may also affect the arousal-performance relationship. The difference in skill levels - beginner, intermediate, advanced (for example), and experience level - youth,
novice, college, or elite, and competition level - national, regional, state, - are all factors. Continuing research has indicated that athletes who are more experience or who are more skilled will cope differently and more effectively than those with less skill or experience (Mahoney and Myers, 1989). According to Mahoney and Myers (1989), experience level and/or skill level may affect pre-competitive coping skills including routines and high-stress tasks.

There are several other additional theories regarding this relationship: Hanin’s Zones of Optimal Functioning, which argues that the occurrence of optimal level of state anxiety varies by individual rather than occurring at a midpoint (Weinberg & Gould, 1995), as indicated by the Inverted U-Hypothesis; the Multidimensional Anxiety Theory which examines the differences between cognitive and somatic state anxiety (Weinberg & Gould, 1995); Hardy’s Catastrophe Model, which also addresses the differences in anxiety levels according to physiological (somatic) state anxiety and worry (cognitive anxiety) (Weinberg & Gould, 1995); and the Reversal Theory, which argues that how the
individual views her arousal level indicates how arousal will effect performance (Weinberg & Gould, 1995). In general, these theories concur with the Inverted U-Hypothesis, while including other factors that may help to explain the anxiety-performance relationship.

Arousal can affect performance both physically and mentally. Physiologically, an athlete can "tense up", indicating increased muscle tension, which can make physical performance difficult. According to Weinberg and Gould (1995), increased muscle tension can interfere with coordination of physical activity. Increased state anxiety has resulted in more muscle use, than if no state anxiety was present. It was shown that athletes who experience higher levels of state anxiety used more muscle energy during activity than did athletes with lower levels of anxiety (Weinberg & Hunt, 1976; as cited by Weinberg & Gould, 1995). It was also recognized by Page, Sime, and Nordell (1999) that there was a distinct relationship between motor performance and competitive anxiety.

Arousal can also hinder an athlete’s mental ability. Concentration and attention are two cognitive
areas that can be affected by arousal (Weinberg & Gould, 1995). Over-arousal can lead to attentional narrowing by the athlete, while under-arousal can lead to an overly broad attention focus (Weinberg & Gould, 1995). Also, an athlete can "attend to inappropriate cues", which indicate that the athlete does not concentrate fully on the task at hand (Weinberg & Gould, 1995, p. 107). It was shown by Landers (1980) that attentional disruptions occurred due to increases in state anxiety. It was argued that this was caused by "biases in the information the performer receives from the environment" (p. 78).

An athlete making mental errors in competition can be one way that over-arousal can negatively affect performance. Mental errors that occur during competition are considered to represent cognitive/attentional disruptions (Bird & Horn, 1990), which are linked to high levels of cognitive anxiety. A study by Bird and Horn (1990) examined the relationship between the level of cognitive anxiety and the degree of mental errors of female high school varsity softball players. It was shown that increases in cognitive anxiety levels were
directly related, "in a linear fashion, to mental errors that occur during sport performance" (Bird & Horn, 1998, p. 220).

In addition, state anxiety levels can be influenced by "individual differences in various achievement-related constructs" (Hall, Kerr, & Mathews, 1998). For example, one study looked at how perfectionism and achievement goals may affect pre-competitive anxiety. It was shown that concerns over mistakes, doubts about action, and personal standards were predictors for cognitive, anxiety, somatic anxiety, and confidence in high school runners (Hall, Kerr, & Mathews, 1998). The study also indicated that perceived ability was a consistent predictor of self-confidence, while ego and task goals served as a predictor for both cognitive anxiety and self-confidence. Another study by Jones and Hanton (1996) showed that goal attainment expectancies served as an indicator of cognitive anxiety. Fear of failure and fear of evaluation were also shown to be indicators of competitive trait anxiety (Rainey & Cunningham, 1988). Lastly, it was postulated that the way an athlete views anxiety (as positive or negative)
can also determine the affects that anxiety can have on performance (Nordell & Sime, 1993; as cited by Page, Sime, & Nordell, 1999).

Despite the support that indicates that anxiety leads to impaired performance, the total arousal-performance relationship is still in question. There have been various studies that have found no significant relationship between cognitive and somatic anxiety and performance (Caruso et al., 1990; Gould, Petlichkoff, Simons, & Vevera, 1987). However, it was shown that anxiety levels vary for athletes before, during, and after competition (Caruso, et al., 1990). In a study by Gould, Horn, and Spreeman, (1983) it was shown that nervousness could both help (on occasion) and hinder (on occasion) performance in junior elite wrestlers. The inconsistent findings indicate that the anxiety-performance relationship is influenced by many variables. These may include, age, experience level, gender, type of sport, and perceptions of anxiety. However, existing research does support the notion that there is some form of relationship that does exist between arousal and performance.
ASSESSMENT TECHNIQUES FOR ANXIETY

SPORT COMPETITION ANXIETY TEST (SCAT)

Description

The SCAT is a 15 item self-test. Subjects respond to items asking how they generally feel when they compete in sports and games. A three-point ordinal scale is used for the responses: hardly ever, sometimes, or often. Ten items are used to determine how prone an individual is to competitive trait anxiety, or the tendency to perceive a competitive situation as threatening and/or to respond to these situations with heightened levels of state anxiety (Martens, 1977; Martens, Vealey, & Burton, 1990).

For example, one item states, “When I compete, I worry about making mistakes” (Martens, 1977; Martens, Vealey, & Burton, 1990). There are 5 additional spurious items that are included to decrease the chance of possible response bias. The score ranges from a 10 - low competitive trait anxiety, to a 30 - high competitive trait anxiety. The SCAT was created as a research instrument, with two versions available (child, ages 10-14, and adult).
Reliability and Validity

Test-retest and analysis of variance (ANOVA) were used to assess the reliability of SCAT-C. The SCAT proved to have a high level of reliability as well as a large amount of internal consistency (Martens, 1977; Martens, Vealey, & Burton, 1990).

The SCAT items were judged to effectively measure competitive state anxiety which shows content validity (Martens, Vealey, & Burton, 1990). In addition, subjects’ responses to SCAT had a positive relationship with future assessments of both general and competitive state anxiety, thus, the predictive validity of SCAT was supported.

In a study by Gould, Horn, and Spreeman (1983) SCAT validity was shown. SCAT scores for junior elite wrestlers were found to be consistent with the outcome of pre-competitive state anxiety tests.

COMPETITIVE STATE ANXIETY INVENTORY - 2 (CSAI-2)

Description

The CSAI-2 is a self-test used to measure three separate competitive states. These three subscales include cognitive state anxiety, somatic state anxiety,
and state self-confidence. Each subscale consists of a nine-item inventory, for a total of 27 items. An example of a cognitive state anxiety item is, "I have self-doubts." An example of a somatic state anxiety item is, "I feel nervous." An example of a state self-confidence item is, "I feel at ease" (Martens, 1977; Martens, Vealey, & Burton, 1990). The score for each subscale can range from 9-36, and is assessed by the subjects' responses to each of the nine items, using a four-point Likert scale. The CSAI-2 was created primarily as a tool for research.

**Reliability and Validity**

A high amount of internal consistency for each subscale was shown for the CSAI-2 indicating the test to be reliable. Validity of the CSAI-2 has been shown in many studies. Research by Gould, Petlichkoff, Simmons, and Vevera (1987) supported the predictive validity of the somatic state anxiety and state self-confidence subscales. However, this study did not support the cognitive state anxiety subscales with regards to pistol shooting performance.
In regards to the state anxiety-performance relationship, the results for research using the CSAI-2 are relatively equivocal. The method by which performance is assessed seems to be the factor that affects this relationship. Furthermore, the type of sport assessed may also be a factor. Team sports, which involve head to head physical contact verses individual sports may be a factor in state anxiety levels of athletes.

In summary, both the SCAT and CSAI-2 were solid measures of athletes' pre-competitive trait and state anxiety, respectively. Both the reliability and validity has been well documented in research on sport anxiety (Martens, 1977; Martens, Vealey, & Burton, 1990). In addition, the SCAT serves as a valid predictor of competitive state anxiety. This indicates that an athlete who tests with high trait anxiety on the SCAT, will likely test for high competitive state anxiety. The use of the SCAT and CSAI-2 allow for a consistent and reliable measurement of competitive anxiety.
MENTAL TRAINING

One can often hear a familiar argument being made in regards to an athlete's performance: "It's 90% mental, 10% physical".

Although this percentage argument may not be scientifically accurate, it can be argued that athletic performance does rely heavily on the mental state of the athlete. An athlete who lacks confidence in herself would, more often than not, perform poorly. An athlete, whose confidence level is high, would probably have a more successful performance. Athletes can use a mental training program to improve psychological skills. Psychological skills are integral to complete preparation for competition. The athlete must be both physically and mentally capable to handle any situation that may arise in competition, in order to have a successful performance. If used correctly, mental training can be an effective way for an athlete to improve performance.

There are many facets of mental training. A five-step approach would include goal setting, mental log keeping, positive self-talk, relaxation and
visualization/imagery/mental rehearsal (Lee, 1990; Orlick, 1986; Porter & Foster, 1990; Sugarman, 1999). There are many variations of these different types of mental training that can be used. Each skill mentioned can be used separately or together, depending on the needs of the given athlete. These skills can help to give the athlete the mental edge in competition.

Goal setting involves writing down short-term goals - clear and specific to what the athlete wants to accomplish in the next week or month of practice and/or competition, medium-range goals - ranging from two to six months in duration, and long-term goals - ranging from one to four years in duration. The athlete needs to be specific in writing down goals (Orlick, 1986; Orlick, 1990; Porter & Foster, 1990).

The mental log is used for an athlete to write down what she felt during practice or competition. The athlete can write down thoughts and feelings after an important game or practice. It is necessary that the athlete write about both positive and negative thoughts. The log can help an athlete to understand both strengths and weaknesses in the thought process. The athlete
should be able to see what she was saying to herself that helped, versus those thoughts that did not. The log can help athletes to become more self-aware (Porter & Foster, 1990).

Positive self-talk is another important step to mental training. What an athlete is saying to herself can often determine confidence and self-esteem. An athlete is taught both positive and negative things about herself (Kendall, Hrycaiko, Martin, & Kendall, 1990; Orlick, 1986; Porter & Foster, 1990). Negative thoughts about oneself are not uncommon. This skill teaches the athlete to use affirmations of positives over the negatives. For example, if an athlete does not feel confident in playing in college, he may say, "Am I good enough to play here?" In this case, the athlete needs to follow with, "I deserve to be here, because I am a good player." Saying positive things about oneself is a way to build "self-worth and self-acceptance" both qualities that can result in boosting self-confidence (Porter & Foster, 1990, p. 12).

Progressive relaxation is a skill that can be used to regulate arousal. Each athlete tends to have a
different optimal level of arousal. Relaxation should be used for athletes who tend to be over-aroused. Progressive relaxation involves focusing on each major muscle group, by tensing and relaxing each group one at a time. Relaxation techniques can help the athlete by decreasing arousal and anxiety levels. It can also be used to help the athlete prepare for imagery training. Porter and Foster (1990) stipulated that "relaxation before visualization is important because it creates a receptivity in the mind that enhances the depth of the visualization... What the mind thinks, the body will follow" (p. 17). Thus, combining relaxation with imagery training can help to improve the visualization process for the athlete (Gray, Haring, & Banks, 1984; Orlick, 1986; Orlick, 1990; Porter & Foster, 1990).

Imagery training is considered to be the most important step to successful mental training (Orlick, 1990; Porter & Foster, 1990; Sugarman, 1999). Imagery is a psychological tool. As a tool, it can be used to enhance athletic performance. In essence, imagery "is a mental technique that 'programs' the human mind to respond as programmed" (Vealey, 1986, p. 209). It is an
acquired skill that, when used by athletes, may result in improved performance. Imagery as a skill then, requires practice and application in order to be effective.

Imagery works by allowing the athlete to visualize him or herself performing tasks. The athlete can create or recreate experiences in the mind. Ideally, the athlete should involve each sense optimally for these creations. These include visual, olfactory, auditory, tactile, kinesthetic, and taste (Vealey, 1986). Olfactory refers to smell, while auditory refers to sound. Tactile describes the sensations of touch, while kinesthetic sense "is the feel or sensation in our body as it moves in different positions" (Vealey, 1986, p. 210). Using these senses is fundamental in effective imagery technique. The senses will enable the athlete to create a more vivid experience in his or her mind. The more realistic, or vivid, this experience, the better effect the results will have on performance. Another way to create a more vivid image is to involve the emotions and thoughts experienced in competition. By feeling these emotions that are associated with the
imagined performance, the more real the experience can seem.

Imagery practice can also be used to control these various emotions involved in sport. Athletes can experience anger, pain, and anxiety in competition (Vealey, 1986). To use imagery to effectively control these emotions, athletes must recreate in their minds the feelings and thoughts experienced before, during, or after competition. For example, for an athlete to understand why and how anxiety is hindering her performance, it is helpful to know how she felt and what she thought about before, during, and after competition. This can be effectively established using imagery practice.

Another step for successful imagery is for the athlete to establish control over what she visualizes (Weinberg & Gould, 1995). By controlling the image, the athlete is better able to work on skills. Athletes who have little control over their images, tend to imagine mistakes repeatedly, rather than successful completion for the skill. The athlete needs to be able to visualize what she wants to accomplish in the given situation for
Imagery is used to create or recreate experiences in the mind. Three theories are discussed here to explain why this practice is effective in enhancing performance and regulating cognitive behaviors.

First, the Psychoneuromuscular Theory hypothesizes that just as the brain transmits impulses at a constant rate to the muscle in order to execute movement during physical tasks, there are similar brain to muscle firings as athletes imagine performing the tasks (Vealey, 1986). It was shown that even slight electromuscular impulses establishes a mental "blueprint" that can aid an individual in performing a skill in the future (Eccles, 1958, as cited by Vealey, 1986). Lang (1977) also proposed a similar theory that argued that imagery processing may establish a new "blueprint" response which then serves as the basis for performing the physical task.

Scientific evidence has shown that very similar neural pathways to the brain are used when an athlete
performs movement or imagines performing the movement. A study done by Jacobson (1931) and recreated by Hale (1982) showed that subjects who mentally pictured the movement of bending the arm, experienced contractions in the flexor muscles of the arm. A recent study by Bakker, Boschker, and Chung (1996) tested this theory as well.

They used an electromyographic activity (EMG) measurement of the bicep brachii muscles. Movement images of lifting a varied amount of weight were used to assess a difference in muscle activity between a control arm and an experimental arm. The study showed that during the imagined lifting, the EMG activity of the active arm was greater than that of the control arm. Also, the significant difference in EMG activity was reported for the active arm when the imagined amount of weight varied. This shows that there is a connection between the type and difficulty of the task and neuromuscular response.

Similar results were reported in a study by Suinn (1980). In this study, downhill skiers were tested for muscular response when visualizing skiing the competition course. The electrical activity of the leg
muscles were monitored during visualization. Muscle firings changed when the athletes visualized different areas of the course. For example, the muscle activity was greater where the course was more difficult and would actually require more muscle involvement. This shows that imagery may work to help the athlete to prepare for the physicality of competition.

Second, the Symbolic Learning Theory contends that imagery “may function as a coding system to help athletes acquire or understand movement patterns” (Vealey, 1986). This helps athletes to facilitate performance because it enables the athlete to understand the movement being performed. Thus, imagery results in the encoding of various types of movements in the central nervous system of the athlete. This process creates a mental “blueprint”, making the movements more familiar to the individual, even automatic (Weinberg & Gould, 1995).

Sackett (1934) first developed this theory. He argued that imagery “enables performers to rehearse the sequence of movements as symbolic components of a task” (Weinberg & Gould, 1995). It has been shown that imagery
has helped improve performance on movement tasks. The movement tasks that showed the most improvement required cognitive coding rather than more simplistic motor tasks (Feltz and Landers, 1983). It was also shown that using imagery to practice or encode "modeled" movement behaviors using imagery improved performance (Hall, 1983).

Vealey (1986) describes these two theories as ways that athletes can help to "build a machine" to enhance sports performance (p. 213). She uses an analogy between the practice of physical skills and the mental imagery practice. During physical practice, athletes can "use feedback from their muscles and senses to encode the proper cognitive elements of the skills" (Vealey, 1986, p. 213). In using imagery, athletes also use this "cognitive encoding or feedback to help strengthen the mental blueprint (symbolic cognitive code), make the skills more automatic, and build a flawless machine" (Vealey, 1986, p. 213).

Finally, the Psychological Skills Hypothesis is the most pertinent to the mental training argument. This theory says that psychological skills can be developed
and refined through imagery. Psychological skills may include reducing anxiety, enhancing confidence, and improving concentration (Weinberg & Gould, 1995). Imagery can be used as a tool to practice these skills. Psychological skills are recognized as an effective means to enhancing performance. This would imply that imagery could be used to improve performance by helping an athlete to reduce anxiety levels before competition.

By visualizing herself in a stressful situation, an athlete can see herself coping effectively in that situation. For example, a water polo player who has difficulty passing the ball while being pressured by an opponent can visualize herself successfully performing a "pressure pass" to her teammate. Theoretically, the image would create a sense of confidence for the athlete in this type of situation. It may also result in the athlete feeling less stressed when she is being pressured by an opponent. Feeling more relaxed and confident in this situation may reduce anxiety for this athlete during this type of situation.

In summary, all three theories establish some reasons for the successful application of imagery
practice on athletic performance. The Psychoneuromuscular Theory and Symbolic Learning Theory establish that imagery practice is a means for improved physical experience and muscle reaction. The Psychological Skills Theory argues that imagery can help the athlete to control her mental state of mind in certain situations. Paivio (1985, as cited by Moritz et al., 1999) establishes some analytic framework for imagery effects, which encompasses these three theories. According to Paivio, "imagery influences motor behavior through its impact on both cognitive and motivational response systems" (p. 246). This means that cognitive functions of imagery, such as the imagery of motor skill components and game strategies, can affect behavior. In addition, it is thought that "imagery of goals, the activities related to goal achievement, and the physiological arousal and affect that may accompany imaged successes and failures can influence performance vis-à-vis motivation" (Martin, Moritz, & Hall, 1999, p. 246). Despite these theories, whether or not imagery practice can actually enhance performance is still in question.
IMAGERY INTERVENTIONS

When looking at the tri-tiered relationship between anxiety, imagery, and performance, there are many variables to consider. First, there are the independent relationships of these three factors. The anxiety (arousal)-performance relationship indicates that high-anxiety (over-arousal) can lead to impaired performance (Weinberg & Gould, 1995). The imagery-performance relationship indicates that imagery can affect performance in three distinct ways: improved skill and strategy learning and performance; cognitive modification, and anxiety and arousal regulation. However, before these imagery effects can be understood, a sport-specific model of imagery intervention must be explained.

This model for imagery intervention created specifically for sport can help to explain the anxiety-imagery-performance relationship (Martin, Moritz, & Hall, 1999). The model has three parts: the sport situation, imagery type, and outcomes. In addition, imagery ability (kinesthetic and visual) is
considered a factor in the outcome of the imagery intervention.

The sport situation variable includes training, competition, and rehabilitation. Primarily, the athlete would use imagery training for these three sport situations. Imagery during training varies depending on an athlete's skill level. A novice athlete would use imagery as a means to focus on learning new skills and strategies, while an experienced athlete may use imagery during training as a way to enhance the performance of well-learned skills and strategies, and as a means to help stay focused during competition (Hall et al., 1998).

The second sport situation in which imagery can be used is preparing for competition. Imagery may be used to enhance coping skills in competition. It may also be used as a means to help the athlete regulate arousal, maintain focus, and feel confident and positive before, during, and after competition (Martin, Moritz, & Hall, 1999).

Lastly, imagery can be used for rehabilitation. Imagery has been shown as an effective way for an
athlete to cope with an injury or pain (Hall et al., 1998). There are two ways that imagery can aid an athlete who is in pain or injured. First, imagery can help to increase the recovery rate of the injured area. Second, the athlete can continue to practice skills in her mind during the recovery process. This keeps the athlete from feeling that she has lost her ability, as well as actually helping the recovery of the athlete (Weinberg & Gould, 1995).

After the specific sport situation is chosen, the next step of the model is imagery type. Imagery type is determined by image content, which in turn is determined by the athlete’s individual needs. It has been shown that the content of imagery is "crucial in determining its effect on performance" (Lee, 1990, p. 66). It is also indicated that certain types of imagery are more effective for some tasks than others. For example, open skills (head to head competition, like wrestling) may require a different type of imagery than closed skills (individual performance, like gymnastics) (Hardy & Callow, 1999). In addition, it has been shown that athletes from different sports
may use imagery in different ways (Hall et al., 1998; Hall, Rodgers, & Burr, 1990).

Thus, Hall et al. (1998) has categorized imagery into five different types: motivational specific, motivational general-arousal, motivational general-mastery, cognitive-specific, and cognitive-general.

The last part of the model is the possible outcomes of the imagery intervention. These are determined by the sport situation and imagery type used, plus the athlete's imagery ability. The three possible outcomes of imagery intervention vary, but are all connected to possible performance enhancement. An effort will be made to link these possible outcomes to anxiety regulation and enhanced performance.

The first possible outcome is skill learning and acquisition. It has been shown that performance is directly affected by imagery through skill acquisition and practice (Feltz & Landers, 1983; Pie et al., 1995; Ryan & Simons, 1981; Van Gyn, Wenger, & Gaul, 1990). Imagery of motor skills can help the acquisition, learning, and performance of those skills. This can range from fine motor tasks, such as throwing darts, to
gross motor tasks, such as free throw shots in basketball (Hall, 1983). In these cases, imagery was used to rehearse individual motor skills.

Different types of imagery have been used in an effort to improve performance of motor skills. One study by Burhans, Richman, & Bergey, (1988) compared cognitive specific imagery (visualization of a specific sport skill) to motivational-specific imagery (visualizing success of a certain competitive event) in beginning runners. The runners who took part in the cognitive-specific imagery imagined a perfect performance of the movements involved in running. This group had a higher level of performance improvement than did the group that used motivational-specific imagery, where they imagined coming across the finish line being cheered by spectators.

A study by Lee (1990) compared type of imagery used to improved sit-up performance. The group who took part in cognitive-specific imagery imagined doing the actual sit-ups. They showed a much greater improvement in performance over base-line measurements compared to the group who used motivational general-mastery. This group
imagined situations that were associated with feelings of happiness and confidence.

Murphy, Woolfolk, & Budney (1988) did a study that compared the performance improvement outcomes to type of imagery used. In this study, performance of a strength task was tested using a motivational general-arousal imagery strategy (psyching up for the task). This type of imagery was ineffective unless accompanied with cognitive-specific imagery (imagining actually performing the task). These studies have shown that using cognitive-specific imagery is the most effective means to facilitate the learning, acquisition, and performance of motor skills.

In addition to enhancing performance of the individual motor skills, cognitive-general imagery can be used as a means to visualize game-specifics. This means that athletes can use this type of imagery to rehearse actual game-situations or entire competitive events. A study by Fenker & Lambiotte (1987) showed that using this type of imagery on the rehearsal of football plays was a means to improved performance for the team.
Thus, both cognitive-general and cognitive-specific types of imagery can be used to enhance performance.

These studies have shown that athletes can practice a sports skill through imagery training. Skills can be practiced and performed in the mind, and the athlete can work on refining and improving the skill through visualization. Practicing a skill may actually help the athlete successfully perform a skill in a game. Thus, it can be argued that creating the experience and improving ability of performing a skill effectively in a game may increase confidence that in turn could lead to decreased anxiety levels about performing.

It was also shown that imagery is an effective means to practice team or individual strategies. The athlete can visualize where she would go in a special game situation, so that when the situation arises in actual competition, the athlete will feel comfortable with her role (Hall et al., 1998; Orlick, 1990).

For example, a water polo goalie may visualize what she would do during a fast break situation. She could create the experience in her mind, including what she would be saying and feeling, and then see herself
successfully making a block. When that same situation occurs in a game, she may feel less anxious about making the block because she has already "practiced" and "experienced" the situation. Experience level in sports has been shown as one effective means of reducing high levels of anxiety (Vadocz, Hall, & Moritz, 1999). Athletes with a higher level of experience did not have the same anxiety levels in the same situations. Creating game situations in the mind could be a way for an athlete to have an increased amount of competitive experience, thus imagery could be a means for reducing anxiety.

The second possible outcome of imagery training is modifying cognitions, which in effect, means changing the athlete's beliefs and thoughts (Hall et al., 1998). Whether or not the changes will take place is dependent on the athlete's interpretation of the imagery, which is in turn "determined by a combination of personal, behavioral, and environmental factors that are unique to the individual" (Martin, Moritz, & Hall, 1999). This indicates that if the individual views an image as positive, then the image can relate positive effects on
anxiety, self-efficacy, and motivation, for example. A negative image would concur with negative results on these same feelings for the individual.

Two sport-related cognitions that can be affected by imagery intervention are self-efficacy and self-confidence. For example, a study by Feltz and Riessinger (1990) examined the effects of imagery and performance feedback on the enhancement of self-efficacy beliefs and performance of a muscular endurance task. It was shown that there was a significant increase in self-efficacy scores from the group that received imagery training. This occurred despite the fact that the non-imagery competitor always performed better.

Despite this, there have also been studies that have found no connection between imagery use and improved self-efficacy (ex: Martin & Hall, 1995). However, the determining factor seemed to be the type of imagery employed in the study. Self-efficacy was enhanced through imagery if image content used in the experiment involved feelings of success and confidence (motivational general-mastery imagery). This was the type of imagery used by Feltz and Riessinger’s (1990)
experiment, which may be reason for the connection found between imagery intervention and increased self-efficacy in this study versus the others.

Improvements in self-confidence have also been shown in studies using motivational general-mastery imagery. In a study by Callow, Hardy, & Hall (1995), two out of three elite badminton players experienced increased levels of self-confidence after imagery intervention. This is just one example of how imagery can affect self-confidence in a positive manner. The correlation between improved self-confidence and the use of motivational general-mastery imagery was also shown in a pre-competitive situation (Moritz et al., 1996; Vadocz et al., 1997).

Orlick (1990) also supports this relationship. He indicates that an athlete who imagines herself feeling in control, staying focused, and overcoming difficulties in competition, will enhance self-confidence. An athlete who visualizes herself performing well in her mind, may feel as though she can have the same success in actual physical competition. This can also be applied to skills that are usually difficult to physically perform. If the
athlete imagines herself performing a difficult skill perfectly, then this will build self-confidence to perform in competition by providing the athlete with a sense of control (Orlick, 1990).

The third possible outcome of imagery intervention is regulation of arousal and anxiety. It has been shown that imagery can affect arousal and anxiety. Lang (1977) argues that certain images can change physiological arousal. One study of competitive swimmers concurred with this theory. It showed that there was an increase in breathing and cardiac frequency when the athlete visualized certain situations: the pool, bleachers, and spectators; standing behind the block awaiting a race; and actually competing in a race. The physiological changes that the swimmers experience during actual competition paralleled the physical changes that occurred during the imagery sessions (Gallego, Denot-Ledunois, Vardon, & Parruchet, 1996).

As with the other outcomes of imagery intervention, imagery type is very important. The motivational general-arousal type of imagery can be used to both heighten arousal and also to decrease arousal (Orlick,
1990). This type of imagery allows the athlete to prepare for and practice the appropriate and effective responses to situations in competition before actually experiencing the real-life situation. This type of imagery may include a combination of relaxation techniques and visualizing oneself feeling at ease and comfortable in a competitive situation (Vadocz et al., 1997).

The importance of imagery type was further shown with various studies that used cognitive-specific imagery. It was shown that this type of imagery was ineffective in controlling pre-competitive anxiety levels between a control group and an imagery group (Carter & Kelley, 1997). This indicates that the type of imagery used to control arousal can be very important.

A study by Vadocz et al. (1997) used imagery involving the stress, anxiety, and arousal feelings associated with competition. The results indicated that imagery could be used to help control competitive anxiety and enhance self-confidence. The results also showed that imagery ability and motivational arousal imagery were predictors of cognitive state anxiety. In
addition, the study showed that visual imagery ability was a predictor for somatic state anxiety and motivational general-mastery imagery was a predictor of self-confidence.

The amount of research examining the anxiety-imagery-performance relationship is sparse, however, some studies have examined the effects of a combination of psychological skills. These various combinations have been shown to be effective in optimizing anxiety levels. This indicates that rather than using only an imagery intervention, combining imagery with other cognitive behavioral strategies can be very effective in regulating competitive anxiety.

For example, stress inoculation training, which provides the athlete with skills for coping with stress and anxiety, can be used with imagery intervention. This means that the athlete can imagine using these coping skills when dealing with stress and anxiety in possible sport competition situations (Kerr & Leith, 1993). However, it should be noted that motivational general-arousal imagery is very similar to the stress inoculation training skills used by athletes.
In addition, imagery combined with relaxation has also been shown as an effective means of optimizing arousal and controlling anxiety (Gray, Haring, & Banks, 1984; Kendall et al., 1990; Orlick, 1990; Orlick, 1986; Porter & Foster, 1990; Sugarman, 1999.) Studies have shown a decrease in pre-competitive anxiety during the combination of relaxation and imagery (Gray, Haring, & Banks, 1984; Kendall et al., 1990).

Orlick (1990) argues that because athletes have learned to remain calm and relaxed in competitive situations through visualized rehearsal they are therefore less anxious in competitive situations. Once again, when the athlete creates the experience in the mind, when the actual situation arises in real-life, the athlete is more prepared to cope with that situation mentally. Changes in anxiety when using the combined psychological skills suggest that the type of imagery used should include feelings of anxiety, relaxation, stress, and excitement that would be felt before, during, or after a competitive event.

Imagery can also help to improve concentration. The loss of concentration is associated with over or under
arousal (Weinberg & Gould, 1995). The athlete must imagine herself maintaining concentration during a situation where she might lose her concentration (such as a goalie not making an easy block in a one-sided game). For example, "by visualizing what you want to do and how you want to react to certain situations, you can prevent your mind from wandering" (Weinberg & Gould, 1995, p. 285). The athlete must visualize herself maintaining her focus in a given situation.

Imagery can also be used to control other emotional responses. For example, if an athlete has difficulty performing under pressure or has a tendency to get angry in certain situations, visualizing can help by allowing the athlete to see herself coping successfully with these events (Orlick, 1990). The athlete who usually "chokes" due to heightened anxiety levels may see herself continuing to perform well in a game that is tied with only minutes remaining. By creating this sense of calmness in a stressful competitive situation, it may in effect, become second nature to the athlete to cognitively respond the way she visualizes herself responding.
There is limited supportive research for the actual imagery-anxiety-performance relationship. However, the other imagery effects on performance indicate that imagery intervention can affect performance in many positive ways. Although some of these imagery effects may not be used specifically to regulate anxiety, anxiety may be inadvertently regulated by some of these outcomes. Skill acquisition and learning can possibly lead to reduced anxiety of having to perform in competition by creating the experience before it actually happens. Anxiety may be similarly affected by cognitive modifications in behaviors such as self-efficacy and self-confidence. Vadocz et al. (1997) showed that self-confidence was a predictor for state anxiety, and it was also shown by Moritz et al. (1996) that imagery of sport-related mastery experiences and emotions may lead to improved self-confidence in competition. This relationship was also recognized in the development of the CSAI-2 (Martins, Vealey, & Burton, 1990). Lastly, as it has been shown, motivational general-arousal imagery can be used directly to help an athlete regulate competitive
anxiety. These outcomes of imagery intervention indicate that there is a positive relationship between imagery and performance. Furthermore, these outcomes also supply some support of the anxiety-imagery-performance relationship.

DEVELOPING A MENTAL TRAINING PROGRAM

Imagery training (visualization) can be one of the most effective facets of a mental training program (Orlick, 1986; Porter & Foster, 1990; Sugarman, 1990). Porter and Foster (1990) argue that "how we imagine ourselves - our abilities, our acceptability, our worth - ultimately determines who we become, what we do, and what we have, - our reality" (p. 17).

Imagery training can be used for both team and individual sports, and its use can vary greatly from person to person and team to team. Imagery training can be done either with outside guidance for the team or individual, done through audio recording, or done alone with no auditory aid. Visualizations are also conducted in two different ways: "on the field" visualizations and "off the field" visualizations (Porter & Foster, 1990, p. 22). Guided visualization tends to be done off the
field, while on the field visualizations are conducted by the athlete within a few seconds or minutes before or during competition. Despite all these different types of imagery training, one thing remains a deciding factor in its effectiveness: It is the athlete who ultimately has control over the visualization process.

Guidelines

There are many guidelines that can be applied to help make an imagery training program effective. Each guideline provided here should be considered just that. An effective imagery training program will differ for every individual. The effectiveness of some techniques is largely dependant on the individual and the situation. The athlete should make the effort to utilize the suggestions that work best for him or her.

First of all, an athlete must try to do imagery everyday to become highly proficient (Orlick, 1986; Weinberg & Gould, 1995). It is the daily practice of an essential skill that allows the athlete to improve and perfect imagery training. This may mean using imagery before and after practice, and then recalling this practice before competition (Orlick, 1986). This is the
first important step since it has been shown that imagery ability is a factor in how helpful and effective imagery training can be to facilitate performance (Vadocz et al., 1997). Although it is indicated that daily practice is necessary for a positive imagery training program, there is still one factor to consider. Imagery training is an individual process. The need to practice mental imagery can vary from one person to another (Orlick, 1986). Practice should continue until the visualization process becomes familiar. Images should be clear, fluid, and easy to control and recall. Practice will definitely improve the imagery training program (Nideffer, 1985; Orlick, 1986; Orlick, 1990; Porter & Foster, 1990; Vealey, 1986).

In the training session, the athlete should follow two guidelines. First, the athlete needs to imagine doing the skill and the situation as if she were doing it the most precise and perfect as possible. The athlete needs to experience the action - the athlete should see and feel the situation as she would like it to occur (Orlick, 1986). Second, before competition, the athlete should mentally recall these previous images. By
recalling these important plays, skills, feelings, movements, and reactions that the athlete would like to carry into the event, the athlete may have better control over what occurs in the competitive event (Orlick, 1986).

**Preparation**

When applying an imagery training program, there are some positive ways to prepare. First of all, the athletes need to approach the start of an imagery training program with a desire to use the training exercises to their advantage. This involves having realistic expectations for what the imagery training program can provide. Having a set negative approach can disable the chance of having effective results. If an athlete believes that only physical practice can help her improve her performance, then she may not make an effort to "practice" the imagery to her advantage. As it was mentioned earlier, most of the process is directly related to the athlete's ability to imagine and willingness to participate with an open mind.

There are also athletes whose expectations are too high, in regards to the imagery process. Imagery
training is a systematic way to help an athlete improve skills at a reasonable level. This means that the athlete must remain motivated to continue using imagery without seeing an instant reward. Due to the fact that imagery must be practiced on a regular basis, reasonable expectations and motivation are two prerequisites for an athlete to be ready for an imagery training program (Weinberg & Gould, 1995).

When the athletes are ready to participate, the next important step in preparing for an imagery training program is evaluating imagery ability (Vealey, 1986; Weinberg & Gould, 1995). This can be done in a variety of fashions. One of the most effective measures of imagery ability is the Sport Imagery Questionnaire, developed by Martens (1982, as cited by Weinberg & Gould, 1995). Once these evaluations have been assessed, athletes can begin to prepare a routine.

The following step is finding a comfortable setting in which to conduct the imagery session. The area should be free of distractions, and should be somewhere that the athletes can feel comfortable (Porter & Foster, 1990; Weinberg & Gould, 1995). The setting becomes less
important as imagery skills improve. However, at the start of a program, the proper setting can help to determine the effectiveness of each imagery training session (Weinberg & Gould, 1995).

After finding a comfortable setting, another premiere step in preparation is using relaxation techniques before imagery. It has been shown as one way to facilitate the imagery process (Gray, Haring, & Banks, 1984; Kendall, Hrycaiko, & Martin, 1990; Orlick, 1986; Porter & Foster, 1990). Relaxation can enable the athlete to concentrate on the current task (imagery) while forgetting other worries, concerns, or negative thoughts. In addition, the imagery will tend to be more controlled and vivid because it is the one item on which the athlete concentrates (Weinberg & Gould, 1995).

For these reasons, some sort of relaxation technique should be used before the start of an imagery session. This can vary from simply taking some slow, deep breaths to a form of progressive relaxation (the flex and release of major muscle groups). Relaxation techniques are an important way to help prepare the body for a more effective imagery session (Porter & Foster,
1990). Most imagery training programs use some sort of relaxation technique (Nideffer, 1985; Orlick, 1986; Orlick, 1990; Porter & Foster, 1990; Sugarman, 1999). As stated by Porter and Foster (1990), "...for the image to go deeply into the conscious and subconscious mind, it is essential for the athlete to be in a relaxed and receptive mental and physical state" (p. 23).

Image Content

As previously shown, the image content of a particular session is very important. Image content must define what the athlete would like to accomplish with the given session. First, the athlete should apply imagery exercises that can aid in improving vividness, controllability, and self-perception. These three factors have been shown to make visualization of images more effective (Vealey, 1986).

Following this, a simplistic approach to imagery training should be applied. The athlete should begin with simple skills or game strategies that are easy to control. In addition, these skills should be visualized in an environment that is stable rather than reactive (Vealey, 1986). Furthermore, it is important the athlete
creates a positive focus for imagery content. This means that images should include successful completion of skills and outcomes (Weinberg & Gould, 1995).

One way an athlete can learn to visualize perfect skills is through videotape (Weinberg & Gould, 1995). It is difficult to visualize a skill that the athlete has never seen. Thus, if the athlete is able to watch a skill performed to perfection on video, it will facilitate the imagery process.

When the athlete has become proficient in imaging simple sports skills and game strategies, an imagery training program can include more variety. Imagery sessions can include practicing more advanced skills and game strategies, as well as learning new skills. Also, imagery training can include practicing psychological skills, such as attentional control, goal setting, stress management, self-confidence, and arousal regulation. In addition, imagery content can include increasing sport perception (Vealey, 1986). For example, the athlete can use imagery to become more aware of the entire field of play: where all of the players and officials are located.
Image content can lead to the effectiveness of the imagery training program. The athlete and coach need to work to establish a program that can be used to enhance performance. Each athlete has different strengths and weaknesses in practice and competition. Imagery can be used to improve upon all areas of sport. Despite the importance of image content, it is the athlete who ultimately will determine the effectiveness of the imagery training program.

In summary, these guidelines, preparations, and an examination of image content can be used to establish an individual imagery training program for sport situations. When developing a program it is important to establish focus on what is useful to the individual athlete. Each program will vary depending on the many individual differences of athletes. Experience level, skill level, age, level of competition, and imagery ability are just a few factors that determine the effectiveness of a given program. These suggestions were incorporated into the basic program used in this study.
CONCLUSION

The relationship between anxiety, imagery, and performance has been examined in this section. First, the arousal-performance relationship showed that arousal (or anxiety) does affect performance. This effect can be either positive or negative. For optimal performance, the athlete must attain the most favorable level of arousal. Conversely, over-arousal or heightened anxiety levels have been shown to negatively affect performance. These negative effects can be both physiological (tense muscles) and cognitive (worry).

Mental training can be used as an intervention to reduce these negative anxiety effects. Imagery training was shown to be one of the most important facets of a successful mental training program. Imagery training may be used to control emotional response, modify behavioral cognitions such as self-confidence, help with skills practice and acquisition, and prepare mentally for coping in a competitive situation. These outcomes of imagery intervention show that imagery can be used to enhance performance by optimizing anxiety levels in athletes. This literature review helps to identify a
relationship between the three entities involving the anxiety-imagery-performance relationship.
CHAPTER III

METHODOLOGY

There have been many studies done on the affects of imagery on athletic performance. Imagery can be used to improve performance. Anxiety is one of the negative emotions that can be experienced by an athlete before and during competition. In order to test the efficacy of imagery on female intercollegiate water polo player’s pre-competitive state anxiety and performance, a psychological skills training program was designed for the women’s water polo team at California State University, San Bernardino.

SUBJECTS

The subjects for the study were female, intercollegiate water polo players (N=10). The athletes ranged in age from eighteen to twenty-two. The average age was 19.9 years old, and the mean age was 20 years old. The experience level in competitive water polo ranged from ½ to seven years. There was a very broad spectrum of experience in the sport. The average amount of time playing competitive water polo for these subjects was 2.7 years. This shows that these subjects
were relatively inexperienced in competitive water polo. The experience level in any type of competition was slightly greater for these subjects, however. The amount of time spent competing ranged from four to fifteen years. The average competitive experience was 8.7 years. Thus, the subjects all had considerably less experience playing competitive water polo than experience in general competitive events.

The subjects also reported on previous "mental training" experience. Six subjects had never had any type of mental training prior to this experiment. The four who reported having previously taken part in some type of mental training all used visualization for their training. Two subjects used only visualization, one subject combined both visualization and relaxation techniques, and one combined massage and visualization. All four reported that the mental training had a positive affect on them. One responded that "... felt relaxed and ready to swim." Another wrote, "I felt that if I was totally mentally ready to go out there, that I would do awesome". Still another subject noted, "... it released a lot of anxiety and nervousness." Despite
this, over half of the subjects had no prior experience in mental training.

The subjects also responded to some basic questions, which established their feelings about competition. It was asked on the information questionnaire, "How much of having a successful performance in competition do you feel is mental?"

Answers were based on a choice of percentage ranges. Three subjects responded that having a successful performance was between 25-49% mental, two felt that it was between 50-75%, and five felt that it is more than 75% mental. There were no subjects who felt that having a successful performance was less than 10% mental or between 10-24%. The subjects in this study felt that having a successful performance was a minimum of 25% mental. This shows that they recognize that there is some significance in the mental state of mind before competition.

The subjects were also asked some situational questions. One question asked if the athlete was nervous at the start of the game. Nine affirmed that they did feel nervous at the start of a game, while one athlete
claimed she did not feel nervous. It should be mentioned, however, that the athlete who responded that she was not nervous at the start of the game also had the greatest amount of experience in both water polo competition (seven years) and other types of competition (fifteen years). It should also be noted that only seven of the ten respondents were starting players.

The second situational question asked if the athlete was nervous when the game is tied with two minutes or less remaining. Seven subjects responded that they do feel nervous in this situation, while three athletes claimed that they did not feel nervous. One athlete wrote, "No, not really. I feel more determined." Despite this, the majority of players did admit to the possibility of feeling nervous in a close-game situation. It should be noted that not all players have experienced game playing time during this type of situation but the question was asked in a hypothetical context.

The last question asked the athlete if she prepared mentally for games. Eight players responded affirmatively to this question. One subject wrote, "I
try to focus on nothing but the game and what I want to accomplish for the team...” Another wrote, “Sometimes on the way to a game I would listed to music by myself”. Another athlete responded, “I get serious and think of the skills that I practice that can make me play well in a game.” Still another athlete responded that she begins preparing the night before competition by “...visualizing what I am going to do in the game the following day.” However, this same athlete wrote, “I also try not to think about the game itself right before we play. It makes me nervous if I do.” The others responded in very similar manners. It seemed to be a trend for these subjects to listen to music and to think about skills that they would apply in a game. Only two subjects responded that they did not do any mental preparation for a game.

In addition, it should be noted that the subjects showed a normal range of differing personalities throughout the season. Two players, in particular, were largely extroverts both in and out of the water. Their personalities translated well to leadership roles in the pool. The remaining eight team members were not
outgoing. Their communication during a game situation was less effective. Contributing factors may have been their younger age and the lack of competitive experience. Most of the younger players were quiet, shy, and lacked assertiveness during the competition. One player would often take all responsibility for things that went wrong, even if she wasn’t at fault. She had a tendency to be pushed around a great deal by other members of the team. The range of personality is a factor that I assessed during my observations throughout the season.

**METHOD**

The psychological skills training took place over six weekends: April 1-2 (4 games/2 per day), April 8-9 (4 games/2 per day), April 15 (2 games), April 22 (1 game), April 29-30 (4 games/2 per day), and May 6 (3 games). There were a total of eighteen games during the training and a total of thirty-five games throughout the entire season. The sessions focused on imagery training. Imagery training was conducted for fifteen minutes and would begin one hour before the start of the game.
The players would then continue with their same pre-game routine. This consisted of a preparation period (changing into the team uniform) and starting the game warm-up approximately one half hour before the start of the game. This routine remained unchanged throughout the entire season. The imagery training was conducted in a manner that did not conflict with the time allotment needed for the other necessary game preparation techniques observed by the subjects.

Each imagery training session was conducted in the locker room located at the site of competition. The subjects were told to get into a comfortable position, to avoid unnecessary movement and to concentrate on the imagery tasks. Lastly, the subjects were read the directions for the imagery session that served to remind the subjects that for the benefit of the group, each person had to make a conscious effort to concentrate on the task and to remain quiet. Two-minutes of progressive relaxation (see Appendix H) was conducted at the start of each imagery training session. The relaxation technique remained constant throughout the entire procedure.
At the start of the procedure, skill-specific imagery techniques (see Appendix I) were used to ease the subjects into the practice of visualization. Skill-specific imagery training was conducted for the ten games beginning April 1, 2000. The subjects visualized simple skills and fundamentals that were used in everyday practice (see Appendix F), but that were always used in competition. The subjects would visualize all the skills mentioned during the training, even if they did not play a position where they would use the skills. For example, a goalie would visualize the skill during the training that may only be used by a field player. This enabled me to keep the group of subjects together during the imagery training.

For the remaining eight games, game-specific imagery techniques (see Appendix J) were used. The subjects would visualize the first quarter from the first to the last whistle. Different game-situations were presented (see Appendix F), each situation replicated something that would likely occur in any competition. Certain situations, such as "six on five play" and "help defense" were repeated during each
session of visualization. There were no new or unexperienced game-situations conducted. Each game-specific situation that was visualized had occurred previously in actual play, meaning that the players had already experienced the situation in an actual game. This was done to facilitate the subject’s ability to effectively visualize the given situations.

The CSAI-2 was administered as a measure of competitive state anxiety. The CSAI-2 was given to the players before the first game of a day or weekend of competition. It was administered both 15 minutes before the imagery training session, and then again directly after the imagery session. The CSAI-2 served to measure any changes in competitive state anxiety after imagery training.

Performance was measured using the team stat sheet. The difference between positive and negative stats was used to assess performance for each individual and for each game. Team stats were combined, and the difference between the positive and negative stats was also assessed to show any changes in team performance.
DATA COLLECTION

I am the women's water polo coach at CSUSB, so my team members were consistently available as subjects for this psychological skills training. I began this small experiment by administering a start-up questionnaire. CSUSB Water Polo Questionnaire Form A (see Appendix D) was given one-week prior to the start of the imagery training. The form was given to each player at the start of practice, and was completed by each player within 10 minutes. The CSUSB Water Polo Questionnaire Form A was devised to provide some background information on my "subjects", and to determine if any of the subjects had previous experience with imagery training. It served as a base-line measurement of imagery experience and background for each subject.

Next, the SCAT-A (see Appendix A) was given to the players the following day at the start of practice. They had 15 minutes to complete the SCAT-A, and most players completed the form in less than 10 minutes. The SCAT-A was given to provide information on the player's trait anxiety, and to serve as a base-line measurement for
which to conduct the remaining segments of the experiment.

The CSAI-2 (see Appendix B) was administered in a slightly varied manner. The team played April 1-2 (4 games/2 per day), April 8-9 (4 games/2 per day), April 15 (2 games), April 22 (1 game), April 29-30 (4 games/2 per day), and May 6 (3 games). On April 1, the CSAI-2 was given for the first time to the subjects one hour and fifteen minutes prior to the first game. They had 10 minutes to complete the form. Immediately following this, the subjects took part in 15 minutes of imagery training. The subjects then were given another copy of the CSAI-2 form to complete within ten minutes. The players then continued with the normal game-warm-up sequence approximately thirty minutes before the start of the game.

I followed this procedure of administering the CSAI-2 before the first game of each weekend. Although imagery training was conducted uniformly before each game played during the given weekend, the CSAI-2 form was given in this format at the start of the weekend, before the first game. The CSAI-2 was used to measure
each player's pre-competitive state anxiety. It was administered in a format that would allow assessment of the direct effect of the imagery training on competitive state anxiety prior to the first game of a weekend.

Performance was measured using the team's standard statistic sheet (see Appendix C). Performance statistics were taken during each game throughout the entire season. The same individual was trained to take record of the statistics and she assumed this responsibility throughout the season. The statistics recorded were divided into positive and negative categories that differed from a field player to a goalie.

The positive statistics for a field player consisted of the following categories; GATT (goal attempts), G-N (goals made in regular play), G-65 (goals made on a 6 on 5 situations), G-4m (four-meter goals made), Asst (assists), steal(s), Ej-Dr (ejections drawn), O-Dr (offensives drawn), and F-Blk (field blocks). The positive statistics for a goalie include S-N (saves in regular play), S-65 (saves made on 6 on 5 situations), S-4m (saves made on four-meter shots), steal(s), Asst (assists). The negative statistics for a
field player include Off (offensives), Turn (turnovers), and Eject (ejections). The negative statistics for a goalie consist of G.Ag (goals against), Turn (turnovers), and Fault(s).

At the conclusion of the experiment, the CSUSB Women's Water Polo Questionnaire Form B (see Appendix E) was administered. The subjects completed the questionnaire after the final game of the season. The subjects were given ten minutes to complete the questionnaire. The questionnaire was conducted to determine the overall effects that the imagery training may have had on the subjects' pre-competitive anxiety and performance levels.

ANALYSIS

Scoring was conducted as follows:

SCAT

Scoring for the SCAT consists of a point system for each item. The ten test items are 2, 3, 5, 6, 8, 9, 11, 12, 14, and 15, are scored using the following key:

1 = Hardly Ever
2 = Sometimes
3 = Often
The scoring procedure for items 6 and 11 is reversed using this key:

1 = Often
2 = Sometimes
3 = Hardly Ever

The range of scores for the SCAT is between 10 and 30. The SCAT can still be considered valid where one test item was missing a response. Where one test item is omitted, to score the SCAT compute the mean item score for the nine items answered, multiply the answer by 10 and then round the product to the nearest whole number (Martens, Vealey, Burton, 1990, p. 55) However, an inventory missing two or more responses was considered invalid. For a small sample, the scoring can be done by hand using a scoring template.

CSAI-2

There are three separate sub-scales used to score the CSAI-2. The score for the CSAI-2 can range from a 9 to a 36. The higher the score indicates a greater cognitive or somatic A-state or the greater state of self-confidence. There is no total score computed for the inventory.
The cognitive A-state is scored by totaling the responses from these nine items: 1, 4, 7, 10, 13, 16, 19, 22, and 25. The somatic-A state subscale is scored by adding the responses from the following nine items: 2, 5, 8, 11, 14, 17, 20, 23, and 26. The scoring for 14 is reversed as follows:

   1 = 4
   2 = 3
   3 = 2
   4 = 1

The state of self-confidence subscale is scored by adding the following nine items: 3, 6, 9, 12, 15, 18, 21, 24, and 27.

Each inventory subscale, in which no more than one response was omitted, can be scored separately to remain valid. To find the score, compute the mean item score for the eight answered items, multiply this value by 9, and then round the product to the nearest whole number. If there are more than one response omitted then the inventory should be considered invalid (Marten, Vealey, & Burton, 1990, p. 177-78).

CSUSB Water Polo Questionnaire Form B

There were 13 statements, with three possible answers: Very Much So, Moderately So, and Not at All.
For the results of the questionnaire, the score from each item should be totaled according to the following scale:

- Very Much So = 3
- Moderately So = 2
- Not at All = 1

For items 7 and 11, the scoring system should be reversed as follows:

- Very Much So = 1
- Moderately So = 2
- Not at All = 3

The score for the questionnaire can range between 13 and 39 on the scale of least effective to most effective. A score between 13 and 20 would indicate that the imagery training was ineffective, a score between 21 and 29 would be considered moderately effective and a score of 30-39 would be considered very effective.

RESULTS

The results of the Water Polo Questionnaire Form A were related in the subject section. Those responses were used only to determine subject information and background.

The results of the SCAT can be viewed in TABLE 1. The scores of the SCAT ranged from 11 (low trait-
anxiety) to 20 (high trait anxiety). The team average SCAT score was a 15.6. This is just above mid-level trait anxiety. The SCAT scores were compared to the results of the first CSAI-2 (1) that can also be viewed in Table 1. The CSAI-2 was scored in three subscales. The results showed a relationship between trait anxiety and cognitive and somatic state anxiety. The subjects who had low trait anxiety scores also had lower state anxiety subscale scores. This relationship is consistent with the literature (Martens, Vealey, & Burton, 1990). It also showed that trait anxiety scores predicted the results of the state self-confidence scores. However, this varied by subject, and was less consistent than the trait-state anxiety relationship.

Imagery training effectiveness was tested using a pre- and post session CSAI-2 test. The CSAI-2 scores were assessed once a weekend (before the start of competition) for 5 weeks of the water polo season. Imagery intervention seemed to be an effective means of decreasing anxiety according to the scores. The scores for weeks one through five can been seen in Tables 2-6, respectively.
Table 1

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<th>SCORE RANGE:</th>
<th>SCAT (10-20)</th>
<th>CSAI-2 (1) COGNITIVE ANXIETY (9-36)</th>
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There was a consistent decrease for cognitive anxiety between the first and second administration of the CSAI-2 for all five weeks according to team averaged percentage change. As imagery training was conducted between the two administrations of the test, this indicates that imagery may have been an effective
means of decreasing cognitive state anxiety. There were various subjects at sporadic times that showed no change in cognitive anxiety before and after imagery. Some scores indicated an increase in cognitive anxiety for some individuals, but these occurred infrequently.

The team averaged a 4% decrease in cognitive anxiety in week one. The average decrease for the team was 4% in week two. In week three, the team averaged a 4.3% decrease in cognitive anxiety, while in week four there was a 3.8% team decrease. In the final week, cognitive anxiety decreased an average of 4.3% for the team. The average team percentage decrease in cognitive anxiety remained fairly consistent throughout the five weeks of imagery intervention. This indicates that the subjects' cognitive state anxiety was affected consistently despite changes in image content in the sessions.

Individual scores tended to vary throughout the five weeks. There was some consistency with the subjects' scores, however. For example, subject two's score indicated a 15, or low cognitive anxiety level after the first administration of the CSAI-2.
Following this, subject two usually scored the same or lower with regard to cognitive anxiety level after imagery intervention. In addition, subject two showed consistent scores for the five weeks of the water polo season. In other words, she remained on the low end of the cognitive anxiety continuum. This could be explained by the initial cognitive state anxiety level which would be difficult to modify, despite changes in opponents, game situations, and image content.

On the other end of the spectrum, the subjects whose scores indicated a high level of cognitive state anxiety tended to show both a consistently high cognitive anxiety score before and after imagery intervention with a greater decrease in cognitive state anxiety after an imagery session. This shows that an individual who has a higher cognitive state anxiety is more affected by the imagery intervention than an individual who has low cognitive state anxiety.

Somatic anxiety also consistently decreased according to the pre- and post imagery assessments of the CSAI-2 (see Tables 2-6, respectively). Team scores
decreased in the first week by 9.5% and by 8.4% in the second week. The third week's scores indicated a 7.7% decrease in somatic state anxiety, while the fourth and fifth weeks showed a 3.8% and 9% decrease in somatic state anxiety respectively.

There was a greater decrease in post-imagery somatic anxiety team scores when averaged than with post-imagery cognitive anxiety team scores. This indicates that imagery was very effective in reducing physical anxiety (somatic). This may be due to the use of relaxation techniques that promote the physiological relaxation over the cognitive relaxation. In addition, the somatic state anxiety team percentage decrease varied to a much greater extent than the cognitive state anxiety scores. This may mean that physiological anxiety response in these athletes was more affected by environmental changes, such as the opponent, than cognitive anxiety responses.

Individual somatic state anxiety scores indicated similar results as did individual cognitive state anxiety scores. Those subjects whose scores showed
high somatic state anxiety maintained high levels before and after imagery intervention throughout the training program, despite large percentile decrease in somatic state anxiety scores after imagery training. The subjects that began the training program with high scores had greater percentile decreases in somatic state anxiety than those individuals with moderate or low somatic state anxiety scores. This indicates that the subjects with higher somatic state anxiety were more affected by the imagery intervention than subjects with moderate or low somatic state anxiety.

Self-confidence scores also varied greatly (see Tables 2-6). However, there was a consistent team percentile increase in state self-confidence. In week one, the team averaged a 4% increase in state self-confidence, while in week two a 4% increase was also shown. In week three, the average increase in state self-confidence was 10.2%, while in weeks four and five the team averaged a 7.4% and 4.3% increase respectively. The large difference in percentage increase in self-confidence could have been affected by the change in image content from skill-specific to
game-specific techniques. In addition, imagery ability may have improved, leading to higher levels of cognitive behavioral changes (self-confidence).

Individual scores showed a consistent relationship between low cognitive and somatic state anxiety scores and higher state self-confidence scores. This may indicate that a high level of self-confidence results in lower state anxiety. However, it was not in the scope of this study to determine if imagery intervention improved self-confidence, thus leading to lower anxiety scores.

Table 2

WEEK ONE PRE- AND POST-IMAGERY CSAI-2 SCORES

<table>
<thead>
<tr>
<th>SUBJECTS</th>
<th>CSAI-2 (1)</th>
<th>CSAI-2 (2)</th>
<th>% Change</th>
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<tr>
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Table 3

WEEK TWO PRE- AND POST-IMAGERY CSAI-2 SCORES

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<thead>
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<th>CSAI-2 (4)</th>
<th>% Change</th>
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Table 4

WEEK THREE PRE- AND POST-IMAGERY CSAI-2 SCORES

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Table 5

WEEK FOUR PRE- AND POST-IMAGERY CSAI-2 SCORES

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<th>WEEK FOUR</th>
<th>CSAI-2 (7)</th>
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Table 6

WEEK FIVE PRE- AND POST-IMAGERY CSAI-2 SCORES

<table>
<thead>
<tr>
<th>WEEK FIVE</th>
<th>CSAI-2 (9)</th>
<th>CSAI-2 (10)</th>
<th>% Change</th>
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<tr>
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</tbody>
</table>
Individual performance was assessed in a comparison of three "repeat" games. This indicates that the team competed against these three opponents in both the first and second parts of the season. The first part of the season was pre-imagery training and the second part of the season occurred during the imagery training. The three opponents used to score individual performance were Chapman University (see Table 7), Whittier College (see Table 8), and CSU Hayward (see Table 9). Individual performance scores varied greatly. However, the average individual scores did show improvement between the first three games and the second three games. In the first three games the average individual performance was a +2.1, indicating an excellent team performance. In the second three games the average individual performance was a +3, also indicating an excellent team performance. The team averaged a +1.5 improvement in performance between the first and second game against Chapman University, a +1 improvement between first and second games versus Whittier College, and a +.2 improvement against CSU Hayward between the first and second
games. This consistent improvement in performance may indicate a positive relationship between imagery and performance enhancement.

Team performance scores indicated some improvement from the first part of the season (pre-imagery training) to the second part of the season (imagery training). As a team, performance increased from a pre-imagery score of +6 to a post-imagery score of +10. These scores were determined by comparing 10 randomly selected games from the first part of the season to 10 randomly selected games from the second part of the season. The opponent was not a consistent factor in this assessment. Both scores are on the high range of a positive performance. The team performance remained on the positive spectrum throughout the whole season, but improved by +4 in the second part of the season.
**Table 7**

Individual Performance Scores v. Chapman

<table>
<thead>
<tr>
<th>OPPONENT</th>
<th>CHAPMAN</th>
<th>PERF.</th>
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<tr>
<td>SUBJECT</td>
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</tr>
<tr>
<td>1</td>
<td>+3</td>
<td>+4</td>
</tr>
<tr>
<td>2</td>
<td>+5</td>
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<tr>
<td>10</td>
<td>-1</td>
<td>+4</td>
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</table>

**Table 8**

Individual Performance Scores v. Whittier

<table>
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<tr>
<th>OPPONENT</th>
<th>WHITTIER</th>
<th>PERF.</th>
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<tr>
<td>SUBJECT</td>
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<td>GAME 2</td>
</tr>
<tr>
<td>1</td>
<td>+6</td>
<td>+2</td>
</tr>
<tr>
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<td>+6</td>
<td>+7</td>
</tr>
<tr>
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<td>+1</td>
<td>-2</td>
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<tr>
<td>10</td>
<td>+1</td>
<td>+3</td>
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</table>
Table 9

Individual Performance Scores v. CSU Hayward

<table>
<thead>
<tr>
<th>OPPONENT</th>
<th>CSU Hayward</th>
<th>PERF.</th>
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<tr>
<td></td>
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<tr>
<td>1</td>
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<tr>
<td>10</td>
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</table>

Imagery intervention effectiveness was also assessed using the Water Polo Questionnaire Form B. The range of scores was a 13 (low effectiveness) to 39 (high effectiveness). The scores indicated that the subjects felt that imagery did positively affect them. The average score was 27, while the mean score was 30. However, individual answers did show that on average, subjects did not feel that the imagery training helped them perform better in the first quarter of play or
close-game situations. This may have been due to image content or the minimal length of the imagery intervention.

Table 10

Imagery Effectiveness Scores

<table>
<thead>
<tr>
<th>SUBJECTS</th>
<th>WATER POLO QUESTIONNAIRE FORM B</th>
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DISCUSSION/CONCLUSIONS

This study indicated that the relationship between anxiety, imagery, and performance is difficult to measure but some trends were identified. The relationship between trait and state anxiety was shown in a comparison of the SCAT and the CSAI-2. The relationship between competitive state anxiety and imagery intervention was directly measured with a pre- and post- imagery administration of the CSAI-2.

The results of this assessment showed a consistent decrease in both individual and team cognitive and somatic state anxiety. This was true for each of the five weeks of the study. This indicates that imagery intervention was an effective means of decreasing state anxiety in these female water polo players.

Interestingly, somatic state anxiety decreased more than cognitive state anxiety as demonstrated by the averaged team scores. This may have occurred in part due to the relaxation techniques that were also administered before competition. The relaxation techniques have been shown to effectively calm the body, as well as the mind,
so the relaxation may have added to the effectiveness of decreasing pre-competitive somatic anxiety.

For each week, cognitive anxiety scores decreased fairly uniformly throughout the study. These results may indicate that the imagery intervention may plateau in work effectiveness; that although team individuals improved imagery ability, this did not affect cognitive anxiety. Another possibility for this uniformity was the redundancy of the CSAI-2 form. The athletes were given the same CSAI-2 form twice a weekend for 5 weeks. It is possible that the athletes merely went through the motion of filling out the inventory. On the other hand, the consistency of the individual scores may indicate that the athletes did answer the questions honestly. Although strong validity and reliability measures were established for these forms, the strength of the validity and reliability may be reduced with repeated testing.

In one case, somatic anxiety scores fluctuated greatly in week four as compared to the other four weeks combined. This may show that there was a greater physiological anxiety response from the team for this
particular weekend, than cognitively. This may be due to
the location of the tournament, the different opponents,
or a combination of both of these factors. In the case
of week four, there was only a 3.8% decrease in somatic
state anxiety, versus an average decrease of 8.6% for
the other four weeks combined. The tournament during
week four was the Western Regional Tournament, hosted by
CSUSB. This may be the reason for the much smaller
decrease in somatic anxiety this particular week. The
players may have been nervous at the prospect of
performing successfully in front of friends and family.

This is interesting, because many athletes tend to
feel more comfortable playing with the "home court
advantage".

I would have expected total anxiety scores to be
lower both pre- and post- imagery because the players
would be performing in a familiar environment. However,
both somatic and cognitive anxiety scores taken before
the imagery session were consistent with scores from the
other four weeks. In addition, post-imagery cognitive
anxiety scores also remained consistent when compared to
the other four weeks. Thus, an outside factor must be
responsible for the fluctuation in the average team
decrease in somatic state anxiety. It should be noted
that this was the only home tournament. All other
competitions were away matches.

Thus, the anxiety-imagery relationship seems to be
fairly consistent in this study. However, there were
many other areas of interest regarding this
relationship. First, imagery ability was not tested.
This has been shown to be a factor in the effectiveness
of the imagery intervention. It was not within the scope
of the study to test for any improvement in imagery
ability. It would be easy to assume that the
visualization process became easier for most of the
subjects throughout the program. In fact, some verbal
feedback was received regarding the imagery sessions.
Subjects were asked if the process did become easier.
Most responses were affirmative, while three subjects
reported continuing difficulties concentrating. This was
not surprising, however, because consistent with the
literature, imagery ability is an acquired skill. Thus,
ability will differ from each individual (Vealey, 1986).
Other than verbal feedback, no other measure of imagery
ability was taken. Due to the importance of this issue, I would suggest that testing for imagery ability would be an important factor in assessing its effectiveness.

The image content used in this study may have been a factor in the outcome of effectiveness of the imagery training. The sessions included the use of cognitive general (motor skill practice), cognitive specific (game-strategy practice), and motivational general-mastery (cognitive behaviors: self-confidence). It was indicated by Hall et al. (1998) that only two types of image content should be used at a time. This may have resulted in an image overload of information for these athletes, thus affecting the effectiveness of the imagery intervention.

In addition, the image content was chosen in an effort to help build experience and improve upon positive cognitive behaviors, specifically self-confidence. The image content included specific motor skills practice and game-situation practice, while associating these actions with feeling of total confidence and success of performing these tasks perfectly. Specific feelings of anxiety and stress were
not included in the image content. According to Hall et al. (1998) and Orlick (1990), the most effective type of imagery to use in regulating arousal (anxiety) is motivational general-arousal. This type of imagery is used to have the athletes feel the stress and anxiety during the imaging process, and then visualize themselves coping effectively with those feelings.

Although this specific type of imagery was not used, the situations that were included in the image content (i.e. pressure passing) could be associated with feelings of anxiety and stress. From personal experience and observation, when a non-elite water polo player has to pressure pass (a motor skill that requires a pass be made while being pressured by a defender) the athlete usually has feelings of stress and anxiety while performing this task. The image content used in this study had them performing tasks that lead to anxiety in competition, and visualizing themselves performing the task perfectly, even under pressure. Despite this, there is no indication from previous research that this type of image content is directly effective in reducing anxiety (Mortiz, et al., 1999).
There are many other factors that could also affect performance scores. The experience level and skill level varied greatly among the ten subjects. These are factors that could directly affect the scores. Another factor that may have affected performance scores is experience gained throughout this season. Imagery training started after nearly half of the games were played during the season. Performance could improve due to the fact that the subjects were able to gain some experience and confidence through actual playing time. Also, the subjects were better acquainted with each other, which would lead to better cohesiveness and team play.

It should also be noted that it is difficult to measure performance through team statistics. Despite the fact that individual and team performance scores improved during the study, the statistics may not be the most accurate means of measurement. This is due to the fact that actual playing time varied greatly among the subjects. Some subjects played an average of two or three times longer in an individual game compared to other subjects. Therefore, the subjects who had more playing time had a greater affect on the team average.
scores of performance, as well as individual performance scores. Also, there are many positive and negative aspects to performance that cannot be recorded statistically.

In one example, the team went through an imagery session where a certain offensive play was visualized. In the actual game, the situation occurred exactly as it had in the imagery script, with the team scoring the first goal of the game. After that play, the team instantly played better and worked harder than I have ever observed as a coach. The fact that what they visualized was actually realized in a real-life/practical situation boosted team confidence and ability.

Another consideration is that the subjects were not aware that self-confidence was also being measured. There was a consistent team increase in self-confidence scores, which indicate that imagery was an effective means of improving self-confidence. I felt that this was due to the fact that imagery created experiences before they happened. As a coach, I observe team improvement from game to game, from the start of the season to the
end. This is due to the experience gained in actual playing time. Self-confidence increased because experience doubled during the imagery interventions.

Another issue to consider is that I began the study with the assumption that most of my team was too anxious, or that their arousal levels were too high. I strived to decrease the anxiety levels in order to optimize arousal. However, some athletes may have needed to become more aroused for competition, and this should have been considered.

The study design was effective in measuring state anxiety changes before and after imagery training. However, some changes could have been made. First, the subjects were all aware that anxiety levels were tested on the inventories. Thus, the inventory responses could have been biased. Second, performance may have been affected by the fact that the subjects were also aware of the hypothesis for the study; that the imagery training would improve performance by decreasing anxiety levels. Therefore, the effect could have been a "self-fulfilling prophecy" of sorts. The subjects may have felt that the imagery would lead to improved
performance, and therefore they had the added confidence and performed better. Finally, the number of subjects were small. It was also a homogenous group. Most of the players were young and inexperienced, which may have been one of the reasons for the consistent improvement in anxiety levels after imagery training.

Despite the fact that there are many variables that could have affected the anxiety-imagery-performance relationship, the study showed that imagery effects could be specifically measured. In this case, anxiety was the athlete behavior assessed. The study was consistent in testing anxiety levels before and after imagery sessions. Further research should be conducted to test the positive affects of imagery on athletic performance. There is limited information on the anxiety-imagery relationship, however, the anxiety-performance relationship is well documented. These relationships have a direct effect on athletes in sports competition. Few studies have been done to determine how these separate relationships may affect the other. For the benefit of the athlete, further research is needed.
for the tri-tiered anxiety-imagery-performance relationship.
Appendix A: California Competition Questionnaire Form A

Directions: Below are some statements about how persons feel when they compete in sports and games. Read each statement and decide if you HARDLY EVER, or SOMETIMES, or OFTEN feel this way when you compete in sports and games. If your choice is HARDLY EVER, circle the label A, if your choice is SOMETIMES, circle the label B, and if your choice is OFTEN, circle the label C. There are no right or wrong answers. Do not spend too much time on any one statement. Remember to choose the word that describes how you usually feel when competing in sports and games.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Hardly ever</th>
<th>Sometimes</th>
<th>Often</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Competing against others is socially enjoyable.</td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>2. Before I compete I feel uneasy.</td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>3. Before I compete I worry about not performing well.</td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>4. I am a good sport when I compete.</td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>5. When I compete, I worry about making mistakes.</td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>6. Before I compete I am calm.</td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>7. Setting a goal is important when competing.</td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>8. Before I compete I get a queasy feeling in my stomach.</td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>9. Just before competing I notice my heart beats faster than usual.</td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>10. I like to compete in games that demand considerable physical energy.</td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>11. Before I compete I feel relaxed.</td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>12. Before I compete I am nervous.</td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>13. Team sports are more exciting than individual sports.</td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>14. I get nervous wanting to start the game.</td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>15. Before I compete I usually get uptight.</td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
</tbody>
</table>
Appendix B: California Self-Evaluation Questionnaire

Name: _______________________________  Sex: M F  Date: ____________

Directions: A number of statements that athletes have used to describe their feelings before competition are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel right now - at this moment. There are no right or wrong answers. Do not spend too much time on any one statement, but chose the answer which describes your feelings right now.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Not at All</th>
<th>Somewhat</th>
<th>Moderately</th>
<th>Very much</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I am concerned about this competition</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. I feel nervous</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. I feel at ease</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. I have self doubts</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5. I feel jittery</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6. I feel comfortable</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7. I am concerned that I may not do as well in this competition as I could</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8. My body feels tense</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9. I feel self-confident</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10. I am concerned about losing</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>11. I feel tense in my stomach</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>12. I feel secure</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>13. I am concerned about choking under pressure</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>14. My body feels relaxed</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>15. I'm confident I can meet the challenge</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>16. I'm concerned about performing poorly</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>17. My heart is racing</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>18. I'm confident about performing well</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>19. I'm concerned about reaching my goal</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>20. I feel my stomach sinking</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>21. I feel mentally relaxed</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>22. I'm concerned that others will be disappointed with my performance</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>23. My hands are clammy</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>24. I'm confident because I can mentally picture myself reaching my goal</td>
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<tr>
<td>25. I'm concerned I won't be able to concentrate</td>
<td>1</td>
<td>2</td>
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<tr>
<td>26. My body feels tight</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>27. I'm confident of coming through under pressure</td>
<td>1</td>
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## Appendix C: Coyote Stat Sheet

<table>
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<tr>
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<th>#</th>
<th>Gatt</th>
<th>G-N</th>
<th>G65</th>
<th>G4M</th>
<th>Asst</th>
<th>Steal</th>
<th>Ej-Dr</th>
<th>O-Dr</th>
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<tr>
<th>Goalie</th>
<th>S-N</th>
<th>S-65</th>
<th>S-4m</th>
<th>G.A</th>
<th>Steal</th>
<th>Turn</th>
<th>Fault</th>
<th>S-%</th>
<th>Asst</th>
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</table>

125
Appendix D: Water Polo Questionnaire Form A

Age: ___________________ Year in school: ___________________

Directions: Answer the following questions based on your own personal experience. There are yes/no questions, multiple choice, and short answer questions. Please answer each question accordingly. There are no wrong answers, so do not spend too much time on any one question.

1. How many years have you played competitive water polo (at any level)?

2. How many years have you taken part in any type of competition (sport, school, other)?

3. Have you ever done any type of mental training for competition (imagery, visualization, relaxation techniques)? (yes/no)
   a. If yes, then what type of mental training did you use? How long did you continue training? Did you feel you responded in a positive, negative, or neutral manner?

4. How much of having a successful performance in competition do you feel is mental?
   a. less than 10%
   b. 10-24%
   c. 25-49%
   d. 50-75%
   e. more than 75%

5. Do you feel nervous at the start of a game? (yes/no)

6. Would you feel nervous playing in a game that was tied, with only 2 minutes remaining in the fourth quarter? (yes/no)

7. Do you mentally prepare for a game? (yes/no)
   a. If yes, then how? (be as specific as possible).

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Appendix E: CSUSB Water Polo Questionnaire Form B

Age: _______________ Year in School: _______________

Directions: A number of statements have been made below regarding the effects of imagery on athletes in competition. Read each statement and then circle the number to the right of the statement based on your own personal experience. There are no right or wrong answers, so do not spend too much time on any one statement, but choose the answer which best describes how you felt.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Very Much So</th>
<th>Moderately So</th>
<th>Not At All</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Imagery training became progressively easier to do throughout the season.</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2. I could visualize myself doing the skills......</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3. I could visualize myself playing in the game.....</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>4. Visualizing myself doing the skills helped me...</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>5. Visualizing myself playing in the games helped me...</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>6. I felt relaxed at the start of the first quarter after the imagery training.</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>7. The imagery training made me nervous before the game.</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>8. After the imagery training, I felt ready to go at the start of the first quarter.</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>9. Visualizing myself play made me comfortable in most game situations.</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>10. Visualizing myself play improved my confidence doing skills in competition.</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>11. I visualized myself doing the skills and playing poorly in games.</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>12. Imagery training before games led to my improved performance in the first quarter.</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>13. Imagery training before games led to my improved performance in close-game situations.</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
Appendix F: Imagery Session Skill and Game Situation List

Fundamental Skills

1. Pressure passing
2. Swimming with the ball to passing
3. Pump faking the ball and shooting
4. Making a block (goalie)
5. Turning, swimming, drawing the ejection
6. Team defense (passing lanes, calling for help)

Game Situations

1. Start of game: sprint, setting up an offense
2. Transitioning from offense to defense
3. Transitioning from defense to offense
4. Transition from offense to a 6 on 5 situation
5. Running a variety of possible 6 on 5 plays
6. Running a variety of offensive plays
7. Running a variety of defensive plays
Appendix G: Directions for the Imagery Sessions
(Verbal)

We are going to do a pre-game imagery session. The session will last approximately 15-20 minutes. After we have completed the session, I want you to get ready for the game in the same way we have been doing all season.

Now make sure you are in a comfortable position. You can lie down or sit up. Do what makes you the most comfortable. Remember that to have a successful session, it takes the cooperation of the whole group. It is necessary that there is no talking during this time. If you have a difficult time concentrating, or if you feel lost at any time during the session, it is up to you to try to find your focus again. Please do not disrupt any other members of the group.

Listen carefully to the instructions. You are trying to concentrate inside your body. I want you to make an effort to sense all the feelings that you may come across during this session. You need to make an effort to feel yourself performing the tasks in the narrative. This will not be easy. It takes concentration and focus. Just take this session one step at a time, and follow the directions. Now, let’s begin.
Appendix H - Relaxation Session
(SAMPLE)
TIME: Approximately two minutes

Pre-Imagery

(Narrative)

I want you to close your eyes. Try to shut out any outside distractions, and begin to put your focus inside you body. Forget about anything else but how your body feels right now.

Take a deep breath. Inhale through your nose. Now release. You can feel any tension leaving your body through that release of air.

Your focus is inside your body. I want you to travel to your toes, and put all your focus on your toes. Now tighten your toes as hard as you can. Now release your toes and feel any tension or stress leaving your body through your toes.

Now travel up through your body to your calves, and put your focus on your calves. Tighten your calves as hard as you can. Now release your calves and feel and tension or stress leaving your body through your calves.

Now your focus is inside your quads. Tighten your quads, feel the tension inside them. Now release your quads and any tension will leave your body through your quads.

Now you travel to your gluts. Put all your focus and energy on your gluts. Tighten your gluts as hard as you can. Now release the tension from your gluts. Feel that negative energy leave your body.

Moving up still, put your focus on your abdomen muscles. Tighten that stomach, and feel the pressure that it creates. Now release that pressure from your stomach. The tension and stress is leaving your body though your stomach.
Focus on your arms and how they feel. Now tighten those arms as hard as you can. You can feel your strength in your muscles. Now release that tension and stress, and let it leave your body through your arms.

Now, travel to your hands. Focus on your hands, and put your hands in fists. Tighten those fists. Any remaining stress and tension will leave your body when you release. Hold your two fists tight. Now release.

Any stress or tension is gone from your body. You feel relaxed and at ease with yourself. Keep your eyes closed and keep you mind clear of distractions.
Appendix I: Skill-Specific Imagery Session
(SAMPLE)
SKILL: Pressure Passing
TIME: Approximately 15 minutes

POST-RELAXATION

(Narrative)

Your focus is completely on your body. Clear your mind of anything else. Focus on you. How do you feel right now? (Pause to give them a moment to think about the question).

Now I want you to feel yourself in the swimming pool. You can feel the cool water against your body. You are treading water and your legs are pushing against the water, and you can feel your muscles working to keep you going.

Now you have the water polo ball. You see the ball, the colors bright yellow with the black lines. You are spinning the ball with your strong hand. Your shoulders are out of the water and you feel the water splash you in the face. You can feel the grip of the ball, what else can you feel right here? (Pause, 15-20 seconds)

Now you can see the defender swim towards you. You turn to protect the ball, continuing to spin the ball, to control it. You are not nervous right now. You feel confident with the ball and you are in control.

You can feel the weight of the defender pressing down on you. You tread water harder, keeping your shoulders up out of the water to help protect the ball. You can hear the defender breathing in your ear and you see her arms reaching for the ball. Imagine how you feel right now. (Pause, for 15-20 seconds).

Now you are prepared to pass the ball. You are looking over your shoulder and you see the whole offense, the other members of your team. You can clearly see the hole set, as well as the defender who is guarding the
hole set. You can clearly see what side the defender is guarding on, and you can hear your teammate calling for the ball.

Now image yourself preparing to pass the ball. You are going through the steps you will need to take to pass the ball to the hole set. What steps will you take? (Pause, 15-20 seconds).

As you prepare to pass, you feel confident about performing the skill. You do not feel like you are going to force a pass. Even though you are being pressured by a tough defender, you know you can make a successful and accurate pass.

You look behind you to make sure that your teammate is still open for the ball. You are continuing to protect and spin the ball, feeling it in your hand and seeing it in front of you.

Now you step out to the ball, putting some distance between you and your defender. You pick up the ball from underneath the water, and feel it securely in your palm. This is a smooth, fluid motion, which you feel very good about performing.

You turn with the ball, and you see the whole offense and all your teammates. You also see that defender coming towards you very quickly. You feel very calm and secure. You know that you can get the pass off to the hole set accurately, however, you also know that if your defender does get to you before you can pass, you can always turn and continue to protect the ball.

You release the ball over your defender, and watch as the ball lands accurately in front of your teammate. You feel great, and your defender continues to guard you.

Now, when you are ready, open your eyes. You still feel confident and secure in your game. Lets get ready to play.
Appendix J: Game-Specific Imagery Session
(SAMPLE)
SKILL: Start of game to 6 on 5 transition
TIME: Approximately 15 minutes

POST-RELAXATION

(Narrative)
Your focus is completely on your body. Clear your mind of anything else. Focus on you. How do you feel right now? (pause to give them a moment to think about the question)

It is the start of the game. You are lined up with your teammates at one end of the pool. You see the referees on deck, you can hear the shouts of your coach and the crowd, and you feel the cool water around you. What do you feel right now as the game is going to begin? (Pause, 15-20 seconds).

You hear the whistle blow, a loud shrill sound. You put your head down and you are swimming as fast as you can. Your muscles feel tense and tight, and you know you are pushing them to the limit. You feel your legs burning as you kick hard, and your shoulders feel strong as you slice through the water.

You can see the ball floating in the water in front of you, and you reach out. You see the other team also reaching for the ball, but you know that that you will get there first. You continue to reach and you feel the ball in your hand. You tip it back to your teammate right before the opposing team gets there. We win the sprint.

You proceed up the pool and you are swimming to your position on offense. You get to your position, and you are ready to play. You feel good and confident in your ability. You know what to do in your position.

Now imagine that you are in the point position, even if this is not your usual spot. You have the ball, and you
are preparing to turn your defender. You know what you have to do in this situation. Your defender is leaning on you and reaching for the ball. You feel the weight and see the arms going for the ball. You can feel her breathing on you and feel her pushing you down. You know at this moment that you can turn your defender, as her hips are low in the water. You reach around your defender and firmly grab the ball in your hand. You are controlling the ball with your strong hand, and you hold onto your defender as you muscle the turn.

Visualize yourself performing the perfect turn, what does it look like, what does it feel like? (Pause, 15-20 seconds)

Now you have completely turned your defender. You can feel her on your back and you swim directly in front of her to draw an ejection. You take a stroke and drop your shoulder in front of your defender. She swims over your back, and you draw the ejection. You hear the referee’s whistle, as he makes the call. You feel great about what you have just done.

Imagine drawing that ejection. See the moves that you would make. What would you do next? (Pause, 15-20 seconds)

Now you pick up the ball from underneath and scan the whole pool. You see your teammates swimming to their positions. You progress the ball towards the goal, you are pumping the ball to work as a threat to the goalie. You watch the offense set up. You know when it is safe to make that first pass to the 'one' position.

When your teammates are set up, you scan the pool again and make the first pass, accurately, right into your teammate’s hand at the ‘one’ position.

Now visualize yourself at the ‘one’ position. You have just received a nice pass from your teammate. You catch the ball and you can feel it in your hand. You look across the pool, at the ‘six’ position. You can see your other teammates, and the defenders. They are all looking at you.
You pass the ball, high and strait, over the defenders, to your teammate in the 'six' position. You watch as the ball lands perfectly in her hand. She catches it, and you see her looking at the goal and pumping the ball. Now she turns to pass you the ball. You are on your legs, ready to receive the pass. You know that if you catch it well, you will shoot the ball. You feel good and confident that you can score the ball.

You see your teammate turn towards you with the ball. She releases the ball, and you are ready to receive it. You see it sail through the air and you know you can catch it. It lands in your hand, and in a split second, you see that the goalie is beat, and you shoot the ball strong side. You release the ball for the shot, and you feel your forearm slap the water in the follow through. You look as the ball goes hard into the goal and we score. How do you feel right now? (Pause, 15-20 seconds).

Now, when you are ready, open your eyes. You still feel confident and secure in your game. Lets get ready to play.
REFERENCES


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