7-1992

The Effects of Imagery on Competitive Anxiety in High School Wrestlers

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THE EFFECTS OF IMAGERY ON COMPETITIVE ANXIETY IN HIGH SCHOOL WRESTLERS

A Thesis

Presented to the
Department of Physical Education and Sport

State University of New York

College at Brockport

Brockport, New York

In Partial Fulfillment
of the Requirements for the Degree

Master of Science in Education

(Physical Education)

by

Lynwood G. VanDenburg

July 1992

STATE UNIVERSITY OF NEW YORK

COLLEGE AT BROCKPORT

BROCKPORT, NEW YORK

Department of Physical Education and Sport

Title of Thesis: The Effects of Mental Imagery on Competitive Anxiety In High School Wrestlers.

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Read and Approved by:

Date Submitted to the Department of Physical Education and Sport:

Accepted by the Department of Physical Education and Sport, State University of New York, College at Brockport, in partial fulfillment of the requirements for the degree Master of Science in Education (Physical Education).

Date: 4/29/93

Chairperson, Department of Physical Education and Sport

ABSTRACT

THE EFFECTS OF IMAGERY ON
COMPETITIVE ANXIETY IN
HIGH SCHOOL WRESTLERS

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STATE UNIVERSITY OF NEW YORK
COLLEGE AT BROCKPORT, 1992
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The purpose of this investigation was to study imagery as an effective tool for decreasing competitive anxiety in high school wrestlers. The investigation was conducted using 27 subjects from a high school wrestling team. The subjects were selected for a treatment or control group by a pretest SCAT score. Both groups consisted of high to low anxiety subjects. The treatment group received an imagery program designed to decrease competitive anxiety. The contact sessions were fifteen minutes in length, culminating into 22 sessions over a nine week period. Both groups were pretested and posttested using the Sport Competitive Anxiety Test (SCAT) (Martens, 1977), and the Competitive State Anxiety Inventory-2 (CSAI-2) (Martens, Vealey, Burton, Bump, & Smith, 1990).

Utilizing an Analysis of Covariance (ANCOVA) design, differences in SCAT and each sub-component of the CSAI-2 inventories (Cognitive, Somatic and State Self-confidence) were evaluated.

The results showed significant reduction in state anxiety for the treatment group, specifically the cognitive and somatic components. There was a trend developing for improved self-confidence, although it was not statistically significant. The trait anxiety results showed no significant difference between treatment and control groups.

The investigation showed that imagery can be an effective tool in decreasing competitive state anxiety.

ACKNOWLEDGEMENTS

It seems appropriate to acknowledge those individuals who have supported me through the trials and tribulations of this thesis. It is because of these people, that I have succeeded in my educational pursuits.

I would like to thank the 1991-92 Brockport High School Wrestling Team for seriously becoming involved in this project.

I would also like to thank Dr. Swapan Mookerjee and Dr. Ronald Davis for serving on my thesis committee. I appreciate their suggestions, cooperation and assistance.

I especially appreciate the guidance and support from my advisor, Dr. Daniel Smith. His experience and expertise in the field of Sport Psychology was instrumental in steering me toward researching the area of Sport Psychology.

I wish to thank my children, Kelley and Emma, for their understanding of the time commitment necessary to finish this research, and I love them dearly for their support.

Finally, I wish to express my love for my wife, Nancy, and thank her for the endless support, patience, love, help and encouragement throughout my thesis work.

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CHAPTER I

Introduction

Anxiety exists and it is a fact of life. We assume stress or anxiety affects everyone to some degree. In the world of sport there is a unique type of anxiety. It is anxiety associated with competition. It is unique because it is specific to competitive situations.

Competitive anxiety encompasses three main components. One of these components associated with anxiety in competition is the mental or mindset of the individuals. These thought patterns that are taking place have an impact on competitive anxiety. This component is labeled cognitive anxiety.

Another component specific to competitive anxiety is somatic anxiety. Somatic anxiety is associated with the physical feelings that take place before or during competition. In layman's term, this would include the "butterflies".

The third component related to competitive anxiety is labeled self-confidence. This involves how much an individual trusts their own ability to be successful in a specific competitive situation.

For this reason there is a need to investigate the effects and control of anxiety. It is in the best interest of coaches, athletes and educators to better understand anxiety, its' effects, and to search for ways to combat it.

Numerous studies have investigated anxiety and its' relationship to performance (Carron and Mumford, 1968; Martens & Gill, 1976; Gould, Horn and Spreemann, 1983a, 1983b; Gould & Weinberg, 1985; Martens, Burton, & Vealey, 1990).

Imagery, visualization, and mental rehearsal or mental practice have been studied in depth in their ability to affect physical performance and skill acquisition (Burstein, 1985; Corbin, 1967; Jowdy, 1987; Mumford, 1984; ith, 1987). A common belief exists that the body cannot distinquish clearly the difference between what is actually happening and what the mind pretends is happening. This is similar to a dream state. Agreeing with the aforesaid belief, it is assumed that imagery can be used to improve performance in dealing with anxiety in sports.

Wrestling is a competitive sport that comes with ready made anxiety levels. Wrestling pits one individual's physical and mental abilities face to face against another individual. For this reason, having good mastery of the mental game, as well as factors controlling anxiety, will hopefully provide an edge for becoming a successful wrestler.

Statement of the problem

The purpose of this investigation was to study whether or not an imagery program would have a positive effect on competitive anxiety among high school wrestlers.

Need for the study. Educators, coaches, and athletes are always trying to gain an advantage and to help improve performance. Since anxiety is a disruptor of performance, there is a need to find a controlling factor to help the individual alleviate stress and to increase the potential for peak performance. Anxiety, whether it be taking a final exam, going through a job interview, or competing in a championship meet, has some effect on everyone. A study done in 1983 (Gould, 1983a) investigated anxiety in wrestling. The study found that a majority of elite junior wrestlers stated that they become nervous or worried in 67% of all their matches. Research has mostly been concerned with the elite levels of wrestling, whether at the college level or the junior elite level. Research needs to be done at the novice and non-elite levels of high school wrestling in order to increase our knowledge of the effects anxiety has at all levels. It is hoped that this investigation will shed light on a possible skill that will lessen anxiety and help increase performance.

Delimitations. This investigation was designed to study the effect imagery would have on anxiety of high school wrestlers at Brockport High School. The wrestlers ranged from 9th to 12th grade. The wrestling skill level was that of junior varsity and varsity levels, and included novice to skilled performers.

Limitations. Imagery, being very individualized in nature, caused a limitation in controlling the actual thought patterns taking place in the individual's mind during imagery sessions. Another limitation was the use of a smaller number of subjects per group than would be desired (N=15). Due to the length of the treatment (22 sessions), it was also difficult to ensure all the participants were at all of the imagery sessions.

Definitions

Anxiety. Webster's (1984) dictionary defines anxiety as a state of uneasiness; apprehension and worry. When dealing at a competitive level, anxiety can be perceived as threatening, and an athlete may respond to these situations with feelings of apprehension and tension.

Competitive Anxiety. Competitive anxiety is a sport specific anxiety associated with competitive situations.

Imagery. Imagery as defined by Martens (1987), "is an experience similar to a sensory experience (seeing, feeling, hearing), but arising in the absence of the usual external stimuli" (p. 78). Experiencing the situation as if it were real in your mind, without physically encountering the experience at that time, characterizes imagery.

State Anxiety. State Anxiety is an existing or immediate emotional state characterized by apprehension and tension (Spielberger, 1966).

Cognitive State Anxiety. Morris, Davis, and Hutchings (1981), defined cognitive A-State as "negative expectations and cognitive concerns about oneself, the situation at hand, and potential consequences" (p. 541).

Somatic State Anxiety. Somatic A-state refers to the physiological and affective elements of the anxiety experience that develop directly from autonomic arousal. Somatic A-state is reflected in such responses as rapid heart rate, shortness of breath, clammy hands, butterflies in the stomach and tense muscles (Martens, 1990).

Self-confidence. Vealey (1986) conceptualized sport confidence as the degree of certainty athletes possess about their ability to be successful in sport.

Trait Anxiety. A predisposition to perceive certain situations as threatening and to respond to these situations with varying levels of state anxiety.

In layman's terms, trait anxiety is the general feeling the individual will have about a specific situation; state anxiety is how the individual feels at the time the specific situation is encountered.

Novice. For the purpose of this study, an individual who has less than one year wrestling experience at the high school level.

Skilled. For the purpose of this study, an individual who has won more than 20 matches in a given season at the varsity level.

CHAPTER II

Review of Literature

This chapter reviews studies associated with anxiety and athletic performance, imagery and investigative methods.

Anxiety and Athletic Performance

One of the first investigators to examine the relationship between anxiety and athletic performance was Fenz (1975). The subjects for the study were parachutists with anxiety being assessed through monitoring of heart rate, respiration rate, and/or projective tests on a number of occasions prior to competition (e.g., on arriving at the airport, in jump gear, at 2,000 feet, at final altitude). Differences in precompetitive anxiety patterns between good verses poor and experienced verses inexperienced parachutists were investigated. The results showed that the novice (and poor performing) parachutist experienced a sharp increase in their physiological activity and reported an increase in anxiety and fear up to the moment of the jump. Experienced (and good performing) parachutists also experienced a sharp initial increase in physical activity which was followed by a sharp decrease in this activity, so that prior to the jump, responses of the experienced jumpers were only slightly above their normal levels. This produced an inverted V shaped response. Thus, Fenz found a clear difference

between the two groups in anxiety, in relationship to previous experience with the task.

Another study that investigated competitive anxiety patterns and their relationship to athletic performance was Highlen & Bennett (1979). This study was conducted with 39 elite wrestlers trying to earn a spot on one of the Canadian World Wrestling teams. The wrestlers were asked to rate their typical anxiety level on a ten point Likert-type scale at various times preceding competition (e.g., 1 week, 1 day, 1 hour prior to competition). The results of the investigation showed that anticipatory anxiety before competition was higher than anxiety exhibited during competition.

Gould, D., Weiss, M., and Weinberg, R. (1981), attempted to replicate Highlen and Bennett's (1979) findings, using 49 collegiate wrestlers from the 1980 Big Ten Wrestling Championship as their sample. Unlike Highlen and Bennett, who found differences in anxiety levels of successful and unsuccessful wrestlers, Gould, et al. (1981), found no difference between the successful and unsuccessful wrestlers. The investigation, however, did reveal the same inverted V pattern of precompetitive anxiety, regardless of success that Fenz (1975) discovered. All the wrestlers exhibited some increase in precompetitive anxiety which was documented through the other studies.

Gould, et al. (1983 a), investigated competitve anxiety in Junior Elite Wrestlers. In support of Gould, et al. (1981), this study also showed no significant differences in precompetitive and competitive anxiety patterns between successful or less successful, or more experienced and less experienced wrestlers. The study did reveal that a majority of the wrestlers stated they became nervous or worried in 67% of all their matches. The data from the investigation pointed out that the wrestlers with lower anxiety scores on the Sport Competitive Anxiety Test (SCAT), were more confident in their tournament predictions, worried in fewer number of matches, felt their nervousness less often hurt their performance, had less trouble sleeping, and showed a higher percentage of place winners than the higher score SCAT subjects.

Gould, et al. (1983 b), labeled fear of failure and feelings of inadequacy as the major sources of anxiety, along with performing up to one's ability and participating in a championship meet as other sources of anxiety associated with wrestling. A study done by Nagle and Morgan (1975), reported that the most successful Olympic Trial Wrestlers were less confused and more vigorous than the ones that did not experience as much success.

Simmon and Martens (1979), in their study examining children's anxiety in competitive athletic situations, investigated anxiety and its relationship to sport participation. What was revealed by this study

was that individual sports participants demonstrated higher anxiety levels than team sports participants. The highest state anxiety levels were found for individual contact sport participants, in which wrestling is categorized.

Mahoney and Avener, (1977); Meyers, (1979); and Pilkington, (1988) have shown that anxiety can have a positive effect as well as a negative effect on performance, but most theorists seem to agree that maximum performance is reduced by too much anxiety.

In summation of the literature on anxiety relating to performance, the studies have shown that there tends to be an increase in anxiety level associated with the nearness of a competitive situation. It was also stated that the highest level of anxiety is associated with sports that have characteristics similar to wrestling.

Finally, it was consistent through the literature that individuals who showed lower levels of anxiety, as tested by SCAT, showed better performance in competitive situations.

Imagery. Imagery in its earlier use as therapy, was considered to be mystical and feign (Smith, 1991). Today, imagery is being used in the medical field as a form of therapy for cases of systematic desensitization, flooding (impolsive) therapy, stress innoculation, induced anxiety and self-control, as well as experimentally with cancer

treatment to increase the longevity of cancer stricken patients.

Meichenbaum (1978) introduced three possible processes to explain the psychological effectiveness of imagery in imagery-based therapies: (a) a feeling of control that the client gains as a result of rehearsing and monitoring the images; (b) the ability to change or modify the internal dialogue associated with maladaptive behavior, and (c) mentally rehearsing alternative responses that can lead to the enhancement of coping skills. Cautella and McCullough (1978) investigated the connection between overt (physical) and covert (cognitive) behavior, and found them both capable of being affected by learning through basic learning principles. Cautella and McCullough stated:

> Problem behaviors, overt as well as covert, are assumed to be subject to learning principles, and therapeutic improvement depends upon systematically manipulating specially constructed imagery according to learning principles to increase adaptive behaviors and to decrease those that are maladaptive (p. 228).

From the previous statement an assumption can be made, that appropriate behavior, mentally or physically, can be learned through imagery sessions. Through visualization of a stressful situation, a modification of the perception involved in a stressful situation can be altered to change the problem behavior.

Lanning and Hisanaga (1983) revealed that competitive anxiety in female athletes can be reduced by means of a systematic training in anxiety management. Murphy and Woolfolk (1987) supported this when they found that cognitive behavioral stress reduction techniques are effective in reducing anxiety in competitive athletic situations. The study also showed a large decrease in self-reported anxiety due to the cognitive techniques.

There have been numerous studies involving imagery and its relationship to skill acquisition and motor development. Feltz and Landers (1983) revealed that more than 100 imagery groups showed improvement from motor imagery with fewer than 35 groups showing no improvement. But most of these studies were investigating physical skills only. The investigator is more concerned with the effect imagery has on the psychological skills involved in athletic competition. Most athletes learn the benefits of imagery through trial and error due to coaches inadequacies in exposing imagery methods to athletes. Some coaches only coach the physical aspects of the sport, and neglect the mental preparation, thus leaving mental preparation up to the athlete himself/ herself.

Internal verses External Imagery. Mental imagery is experienced in one of two ways, either internally or externally. During internal imagery, the individual visualizes themself as though they are living

the experience. External imagery has been characterized as watching a movie projection of themself doing the motor performance. There is a debate among researchers in mental imagery whether internal or external imagery produces better results during performance.

Studies done by Mahoney and Avener (1977), using elite gymnasts, supported the perspective that internal was better. The researchers found that elite gymnasts used internal imagery much more often than they did external imagery. Other studies had similar findings using elite skiers and elite rifle shooters (Rotella, et al., 1978). The supporting studies provided the same conclusion that elite athletes tend to utilize internal imagery more than external during imagery sessions. From these results, the researchers concluded that internal imagery is more effective than external imagery. There are two major studies (Epstein, 1980; Mumford and Hall, 1985) that compared internal imagery directly to external imagery.

From these two studies, no significant difference was obtained in relationship to performance. Mumford and Hall (1985), used figure skaters and found no significant difference in performance whether the subjects used internal or external imagery. Epstein, (1980) also found the same results using a dart throwing task. Although, there is no direct evidence, there is still a strong presumption that the internal perspective of imagery is the better of the two.

Vividness and Controllability of Images. The ability to create vivid controlled images is an important aspect of mental imagery. Vividness refers to the realistic or believable nature of the visualized image. There is a strong belief that the more vivid the image is, the better the effect the image will have on performance. Controllability refers to how well the image can be controlled during visualization. Corbin (1972) states that imagery is most effective when the images are both vivid and controllable. From questionnaires administered to racquetball players (Myers, Cooke, Cullen and Liles, 1979), researchers found that more successful players used more vivid and realistic images than less successful players. Another study (Denis, 1985), reported that it is apparent that subjects who had better control and more vivid images, benefited more from imagery than lesser skilled imagers. There seems to be a trend of research in support showing a more effective result if the images are vivid and controllable.

In the summation of imagery investigations, the literature has shown cognitive practice and imagery to have an effect on physical skill improvement. Some studies have implied that cognitive behavioral stress reduction and anxiety management techniques can have an effect on reduction of anxiety in some athletic situations.

Investigative Methods

In terms of methods for investigating imagery, Lanning and Hisanaga (1983) used a pretest, treatment, posttest format. The subjects were females ranging in age from 14-18, who had high school varsity experience in volleyball. The investigation used (SCAT) Sport Competition Anxiety Test developed by Martens (1977), to measure an athletes' level of competition anxiety. SCAT is available in two forms: A and C. The A form (Adult) is for persons of average reading ability of 15 years or older. The C form (Children) is for the 10-14 age range. Lanning and Hisanaga used the SCAT-C inventory. Extensive validation of SCAT is found in Martens, Vealey, and Burton (1990), and has been used in numerous anxiety studies. The subjects in this investigation were pretested using the SCAT inventory. Following the pretest, individuals were selected for this study who scored 24 or higher on the SCAT. The subjects were then randomly assigned to either a treatment or control group. After each of the seven 30-minute treatment sessions, using a progressive relaxation training method and a breathing easy segment of a sport psyching program, the subjects from both groups were posttested on SCAT. The treatment sessions lasted two and one half weeks with the treatment administered prior to practice sessions. Another posttest was given two weeks following the study to see if there were any changes sustained over time.

Another tool utilized for investigating competitive anxiety is the Competitive State Anxiety Inventory-2 (Martens, Vealey, Burton, Bump, & Smith, 1990). This inventory measures the subjects' state anxiety related to competition. CSAI-2 provides data on individuals cognitive and somatic state of anxiety, as well as the state of self-confidence. CSAI-2 analyzes the subjects' state of anxiety prior to competition. SCAT analyzes the subjects predisposition to preceive certain situations as stressful. Like SCAT, the CSAI-2 inventory has had extensive validation (Martens, Vealey, Burton, Bump, & Smith, 1990).

CHAPTER III

Procedures

This investigation studied whether or not imagery has a positive effect on controlling anxiety in high school wrestlers.

Subjects

The subjects were members of a high school wrestling team, ranging in ages from 14-18 years. This investigation consisted of 27 subjects. The subjects were selectively divided into two groups (T=15, C=12) after SCAT (Martens, Vealey, & Burton, 1990) and CSAI-2 (Martens, Vealey, Burton, Bump, & Smith, 1990) pretests inventorys (See Appendix C). Once the pretest, using SCAT, was evaluated, all 27 subjects were ranked by their anxiety measure. Following the ranking of subjects from one (1) to twenty-seven (27), individuals were paired together by their scores, (1 and 2, 3 and 4, etc.). One subject was randomly selected from the pairings to be assigned to two heterogenous groups. The two groups consisted of high through low anxiety subjects. Group A, the treatment group, was given a treatment of imagery sessions geared to reduce anxiety associated with competition and wrestling in particular. Group B was the control group. They were given instructional and championship tapes to view, that were unrelated to imagery and stress reduction. Both groups were given the prestest CSAI-2 inventory one hour prior

to their first competition. This occurred three days before the treatment sessions began.

Treatment

The treatment consisted of imagery sessions conducted two or three times a week for a nine week period, culminating in 22 actual sessions. These sessions were administered the last 15 minutes of practice. During the imagery sessions, Group A subjects were taught a relaxation method, resembling Jacobson's progressive relaxation (Jacobson, 1932; Bernstein and Borkovec, 1973) (See Appendix A). This relaxation method was included in every session, with the Group A subjects gradually taking over responsibility for getting into a relaxed state before the imagery sessions. The subjects in the treatment group were directed through the muscle relaxation method with the use of an audio tape. Each session of muscle relaxation ended with the subjects concentrating on a relaxing image, specifically a light blue color, this continued for the first twelve sessions. The last ten sessions the treatment group subjects were instructed to concentrate on the light blue color in order to achieve a relax state on their own. Once the subjects were in a relaxed state, the investigator exposed the wrestlers to different competitive anxiety building situations through imagery.

The imagery sessions were geared to changing the apprehension or feeling of no control, associated with the stressful situation. This was accomplished through structured modification of those emotions.

The anxiety situations used in imagery was developed by previously surveying all 27 subjects for situations that were preceived as threatening, and stressful, prior to and during competition. From the survey analysis, situations where the majority of subjects felt high anxiety, as well as situations that the coaching staff felt warranted the attention of the imagery session, were used as the subject matter for the treatment sessions (see Appendix D). The imagery sessions were conducted in a dark quiet room to allow for complete concentration. This design also provided an atmosphere that reduced self-consciousness in an attempt to achieve ultimate levels of control and vividness (visual, emotional, auditory and tactile) during the imagery sessions.

Imagery Assessment

A sport imagery assessment questionnaire (See Appendix B) was given twice during the investigation, along with discussions of how well the subjects visualized the images. This was utilized in hope of maintaining a high motivation for trying to internalize imagery rather than externalizing imagery to achieve better vividness and control.

Control Group

Group B was given wrestling video tapes on instruction as well as actual championship wrestling matches (See Appendix D) to view simultaneously while Group A's imagery session occurred. The

Group B subjects task was unrelated to mental rehearsal or imagery, but geared to making Group B feel they received a treatment, therefore they had a sense of ego involvement in the investigation. This was done in an effort to control for the Hawthorne Effect. The tapes were viewed in a classroom setting similar in nature to Group A's setting. Group B viewed the tapes for a period of time equal to that of Group A's treatment session.

Evaluation

After the third and sixth week, all subjects (A and B groups), were given the SCAT test again, and a final posttest was administered after the ninth week. Each SCAT and CSAI-2 posttest was analyzed to determine significant differences in levels of competitive trait and state anxiety.

Data Analysis

Statistical analysis of data included Analysis of Variance (ANOVA), and Analysis of Covariance (ANCOVA). The data was analyzed for the .05 level of significance. The SCAT was used as the scale to determine grouping due to SCAT's ability to measure trait anxiety. Trait anxiety tends not to fluctuate much over time, for that reason the investigator decided to use the SCAT scale for selection of groups. Analysis of variance was also done on each component of the CSAI-2 inventory separately, to analyze for a significant difference between groups on the pretest.

The second statistical tool used was analysis of covariance, which takes into account the initial differences that exist among subjects. It looks at differences in the posttest while covarying out initial differences. Analysis of covariance was used on SCAT and each component of the CSAI-2 inventory to determine statistical significance, from the pretest scores to the posttest scores, while taking into account the initial differences that existed in the sub-scales of the CSAI-2 inventory.

Analysis of Variance

Analysis of variance (ANOVA) was used to determine if the two groups differed significantly on the pretests (SCAT and CSAI-2). The selected group design should ensure that both groups are equal, but for statistical design purposes, ANOVA must be employed to determine if there are significant differences between the two groups at the start of the investigation.

CHAPTER IV

Results and Discussion

This investigation was concerned with the effect of imagery on competitive anxiety in the sport of wrestling. A pretest-posttest design was used with a treatment and control group. The treatment group received an imagery and muscle relaxation program over a nine week session. The primary purpose of the study was to determine if there was any significant difference in competitive anxiety levels due to the imagery program. A secondary purpose was to investigate what components of competitive state anxiety or sport competitive trait anxiety, would show significant difference between the imagery treatment group and the control group.

In this chapter, the results of the investigation are presented and discussed briefly. The statistical significance of all the following results was the .05 level.

Analysis of Variance

Analysis of Variance (ANOVA) was used to determine if the two groups differed significantly on the pretest. The selected group design, explained in Chapter III, should ensure that the two groups are equal, but for research purposes ANOVA must be employed to determine if there are significant differences between groups at the start of the

investigation. The two groups were divided by the pretest SCAT score only.

TABLE 1

ANALYSIS OF VARIANCE SCAT

PRETEST	MEAN	STD. DEV.	CASES
TREATMENT	25.20	3.67	15
CONTROL	25.75	3.12	12
BOTH GROUPS	25.44	3.40	27

	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F
MAIN EFFECTS					
GROUP	2.02	1	2.02	.169	.685

The main effect comparing the treatment and control group was not statistically significant (.685), which indicates that the means of the groups were not significantly different at the .05 level on the pretest (refer to Table 1). Since the groups were statistically equal at the start of the investigation, any change that occurred at the conclusion may be attributed to the specific treatment received.

Analysis of Variance was done on each component of the Competitive State Anxiety Inventory to determine if the treatment and control groups were significantly different at the start of the investigation.

TABLE 2

ANALYSIS OF VARIANCE

PRETEST COGNITIVE STATE ANXIETY (COGNITIVE A-STATE)

	MEAN	STD. DEV.	CASES
TREATMENT	25.46	4.92	15
CONTROL	20.25	6.80	12
BOTH GROUPS	23.14	6.29	27

	SUM OF SQUARE	DF	MEAN SQUARE	F	SIG OF F
MAIN EFFECTS					
GROUP	181.42	1	181.42	5.35	.029

There was significant difference (.029) in the main effects between the treatment and control group in pretest means for cognitive state anxiety. In fact, the treatment group showed significantly more precompetitive cognitive state anxiety than the control group. Since the groups were not equal in this sub-category at the onset of this investigation an ANCOVA was utilized to covary out the initial difference (see Table 5).

TABLE 3

ANALYSIS OF VARIANCE

PRETEST SOMATIC STATE ANXIETY (SOMATIC A-STATE)

	MEAN	STD. DEV.	CASES
TREATMENT	27.40	5.78	15
CONTROL	21.25	6.69	12
BOTH GROUPS	24.67	6.83	27

	SUM OF SQUARE	DF	MEAN SQUARE	F	SIG OF F
MAIN EFFECTS					
GROUP	252.15	1	252.15	6.57	.017

There was a significant difference between the treatment and control groups' pretest scores for Somatic State Anxiety (.017). Again, the treatment group showed significantly more precompetitive somatic state anxiety than the control group. For that reason, ANCOVA was used to covary out the initial differences (see Table 5).

TABLE 4

ANALYSIS OF VARIANCE

PRETEST SELF-CONFIDENCE

	MEAN	STD. DEV.	CASES
TREATMENT	19.67	4.10	15
CONTROL	21.58	3.83	12
BOTH GROUPS	20.52	4.02	27

	SUM OF SQUARE	DF	MEAN SQUARE	F	SIG OF F
MAIN EFFECTS					
GROUP	24.49	1	24.49	1.55	.225

There was no signficant difference in the pretest between groups (F=.225) on the sub-category of self-confidence. Since the groups were equal at the start of the investigation, any change that occurred at the conclusion may be attributed to the specific treatment received.

Summary of ANOVA.

The main effects for the groups was significantly different in the pretest scores for cognitive anxiety (refer to Table 2), and somatic anxiety (refer to Table 3). The main effect for the groups was not

statistically significant in the component of self-confidence (refer to Table 4), or SCAT (refer to Table 1).

TABLE 5

ANALYSIS OF COVARIANCE

MAIN EFFECT

GROUPS

	SUM OF SQUARE	DF	MEAN SQUARE	F	SIG OF F
SCAT	2.22	1	2.22	.15	.700
CA	170.41	1	170.41	5.12	.028*
SA	162.56	1	162.56	4.76	.034*
CON	.30	1	.30	.01	.909

Key: SCAT - Sport Competitive Anxiety Test
CA - Cognitive State Anxiety
SA - Somatic State Anxiety
CON - State Self-Confidence

*=Significant difference between groups at the .05 level.

The results from the ANCOVA demonstrates that the treatment group showed significant improvement in the two components of state anxiety, but not in trait anxiety. There was a significant improvement in the cognitive state anxiety and somatic state anxiety components. The self-confidence component of the CSAI and the SCAT score did not show significant difference.

GROUP MEANS

Using group means, a graph recording pretest and posttest results exhibits the relative amount of improvement each group made (CA-Graph 1, SA-Graph 2, CON-Graph 3, SCAT-Graph 4).

MEANS OF GROUPS

	TREATMENT		CONTROL	
	$\bar{X}$ PRE	$\bar{X}$ POST	$\bar{X}$ PRE	$\bar{X}$ POST
CA	25.45	20.93	20.25	19.00
SA	27.40	18.67	21.25	17.83
CON	19.67	24.20	21.58	22.58
SCAT	25.20	22.73	25.75	23.00

The results showed that the treatment and control groups improved in mean scores from pretest to posttest for each component investigated.

DISCUSSION OF RESULTS

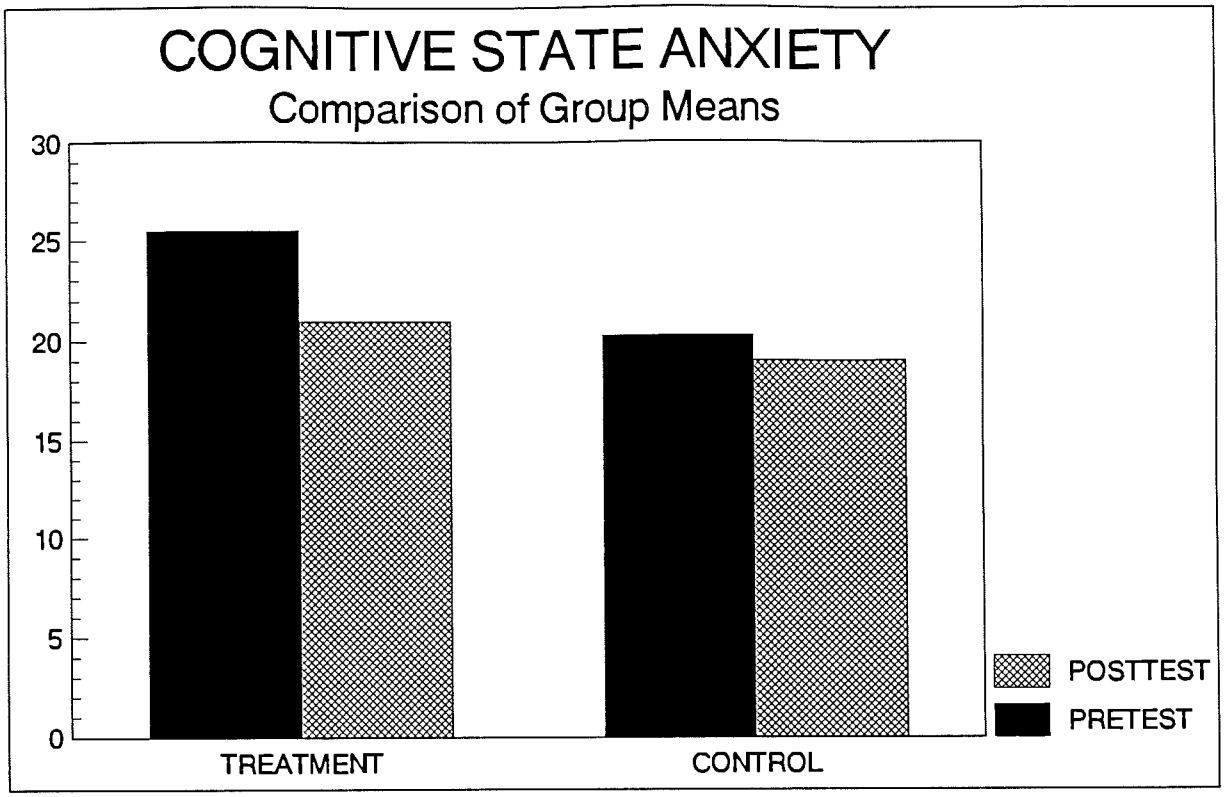
The results of this investigation on the effects of imagery on competitive anxiety demonstrated that state anxiety benefited more than trait anxiety from the imagery program.

Analysis of covariance revealed that the first component of state anxiety, labeled cognitive anxiety, showed a significant improvement for the imagery group. The mean score for cognitive anxiety decreased 17.8% from 25.46 on the pretest to 20.93 on the posttest for the treatment group (see Graph 1).

The second component of state anxiety was somatic anxiety. Somatic state anxiety showed a significant improvement for the treatment group as well. The mean scores, as measured by the CSAI, for somatic anxiety plummetted from 27.40 on the pretest, to 18.67 on the posttest (see Graph 2). A possible explanation for the 31.8% drop of somatic anxiety is that there might have been an over emphasis in the imagery program on controlling physical stressors along with the systematic use of muscle relaxation (a somatic technique).

The third sub-category, as measured by CSAI, was state self-confidence. State self-confidence showed some improvement from pretest to posttest scores, increasing the mean 23.1% for the treatment group from 19.67 to 24.20, but showed no statistical significance over the control group's improvement from 21.58 to 22.58, which is an increase

of 4.5%. Although the sub-category of self-confidence did not significantly improve over the control group, a trend may have been emerging (refer to Graph 3). The treatment group showed more increasing improvement in self-confidence than the control group. With more extensive concentration on self-confidence during imagery sessions, and with a larger subject population or with more contact sessions, a significant effect may have been found.

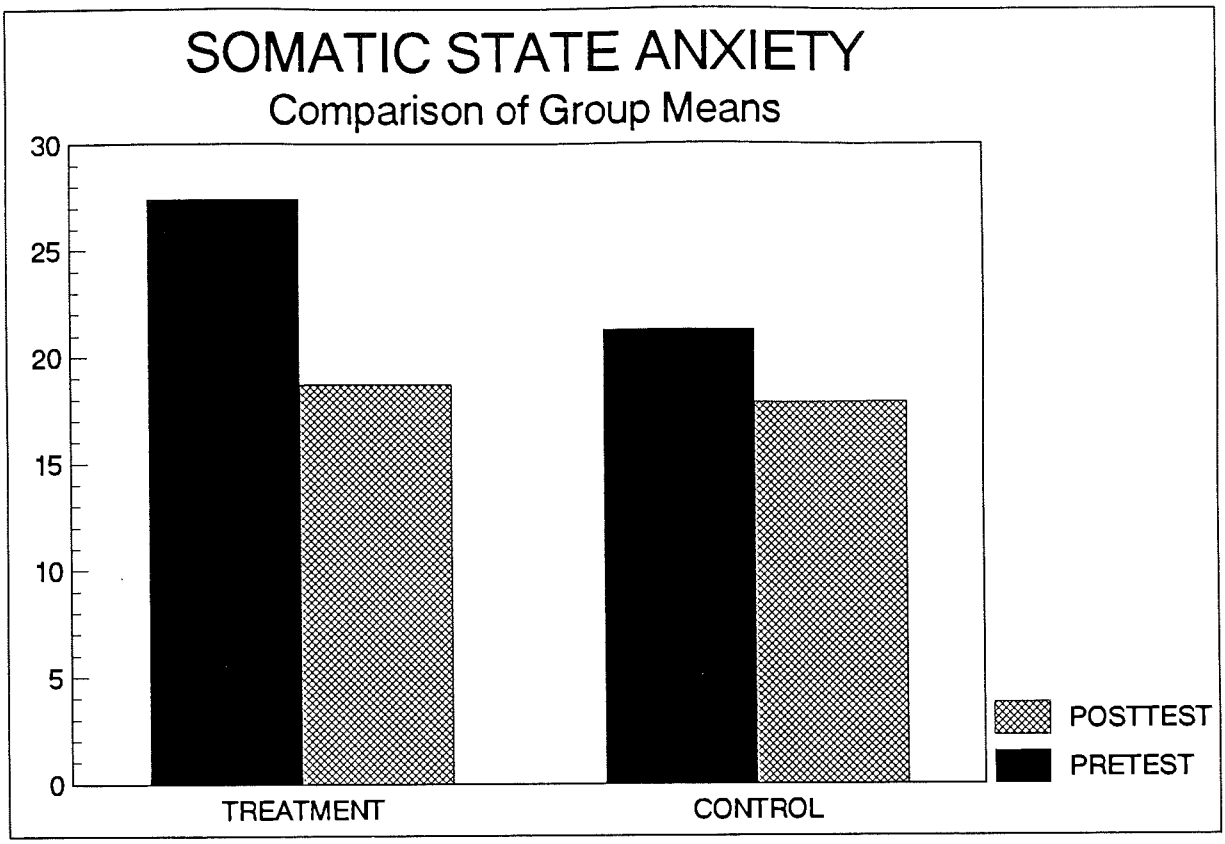


GRAPH 1

Cog. A-State

$\bar{X}$ Pre-Treatment	Std. Dev.	$\bar{X}$ Post	Std. Dev.
25.46	4.92	20.93	5.78

$\bar{X}$ Pre-Control	Std. Dev.	$\bar{X}$ Post	Std. Dev.
20.25	6.80	19.00	5.63

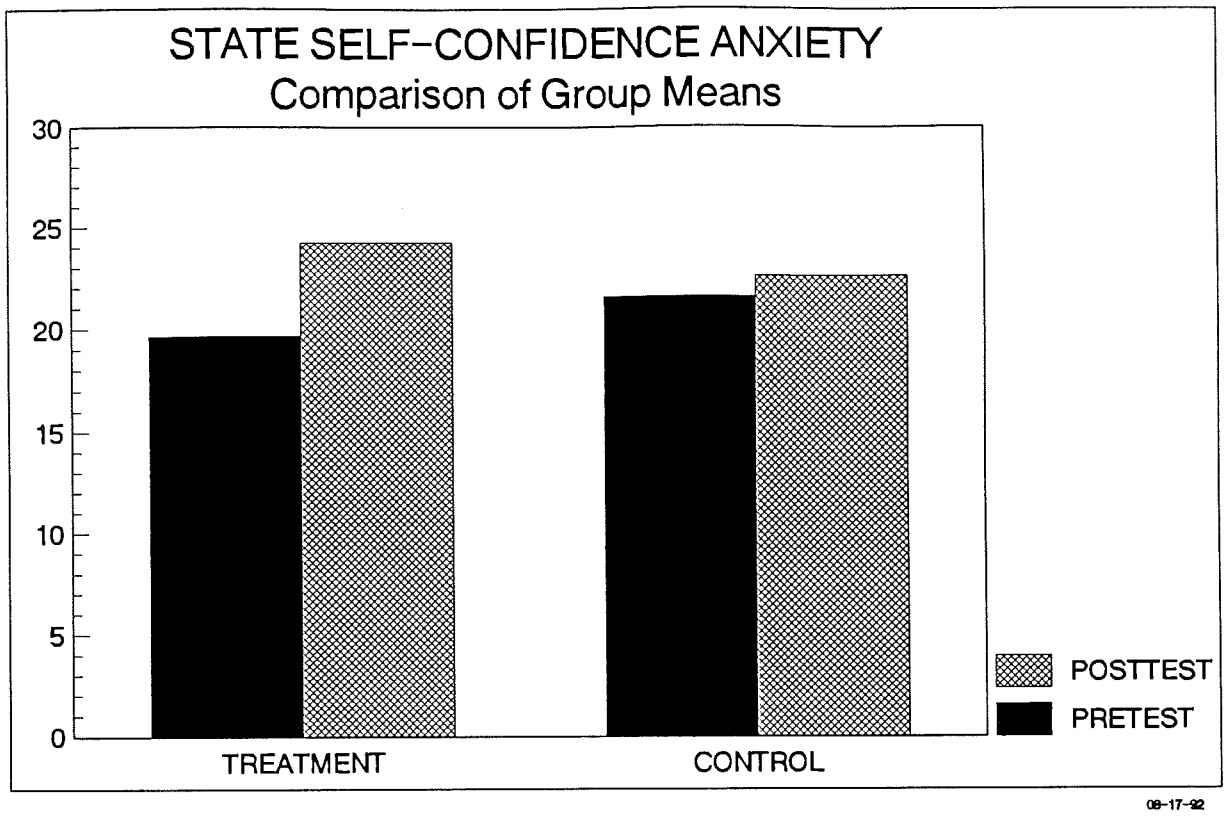


GRAPH

Som. A-State

$\bar{X}$ Pre-Treatment	Std. Dev.	$\bar{X}$ Post	Std. Dev.
27.40	5.78	18.67	5.64

$\bar{X}$ Pre-Control	Std. Dev.	$\bar{X}$ Post	Std. Dev.
21.25	6.69	17.83	4.69



GRAPH 3

SELF-CONFIDENCE

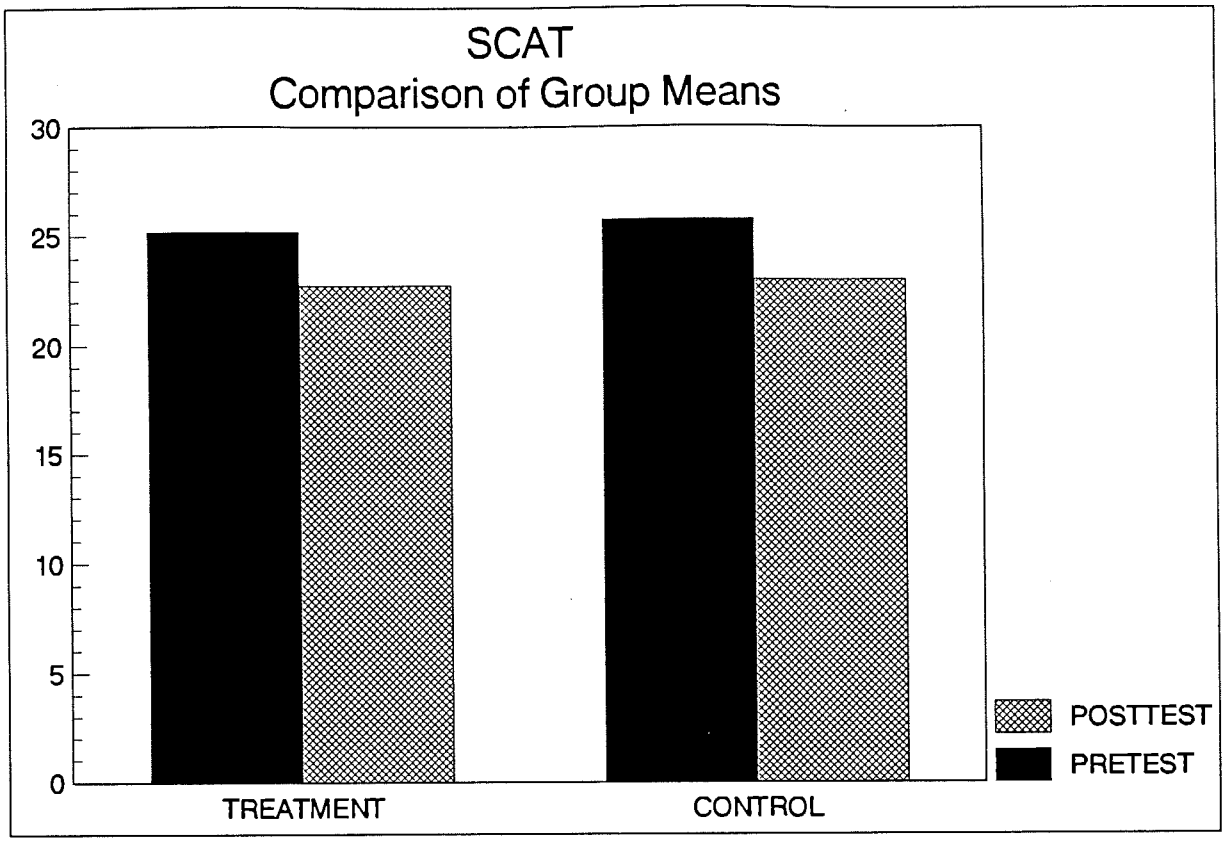
$\bar{X}$ Pre-Treatment	Std. Dev.	$\bar{X}$ Post	Std. Dev.
19.67	4.10	24.20	4.49

$\bar{X}$ Pre-Control	Std. Dev.	$\bar{X}$ Post	Std. Dev.
21.58	3.83	22.58	6.35

The final comparison between the two groups was on the group's SCAT scores. The treatment group lowered their mean scores 9.8% from 25.20 on the pretest to 22.73 on the posttest, which would indicate some improvement; but showed no statistical significance when compared to the control group. This concept is in agreement with findings by Crocker, et al. (1988), and Smith, (1987). Both studies showed no difference in competitive A-trait between the treatment group which used a stress management program, and a control group.

In this investigation, the treatment and control group both lowered the mean scores of SCAT; similarly from pretest to posttest (see Graph 4). This is an usual scenario, because trait anxiety is a much more stable disposition than state anxiety. Therefore, trait anxiety will not tend to fluctuate in the short term. There is the assumption that if state anxiety is lowered over extensive periods of time, trait anxiety will gradually be lowered. The basis for this belief is that trait anxiety is made up of cognitive state anxiety and somatic state anxiety.

An overview of the results showed that both the treatment and control group improved in all four areas that were measured. The state anxiety components of cognitive and somatic anxiety were the only sub-categories to show significant improvement between the groups.



GRAPH 4

SCAT

$\bar{X}$ Pre-Treatment	Std. Dev.	$\bar{X}$ Post	Std. Dev.
25.20	3.67	22.73	4.12

$\bar{X}$ Pre-Control	Std. Dev.	$\bar{X}$ Post	Std. Dev.
25.75	3.12	23.00	4.41

CHAPTER V

Conclusions and Recommendations

The purpose of this investigation was to determine the effects of imagery on competitive anxiety in high school wrestlers. The investigation included a treatment and control group. The groups consisted of 15 subjects for the treatment and 12 for the control group. The selection process was determined after a pretest of SCAT to assure parity of high and low trait anxiety subjects in each group. The treatment group was given imagery sessions intended to lower their anxiety levels. They received 22 contact sessions over a nine week period. Both groups were given a pretest of CSAI-2, one hour before competition. After the ninth week, both groups were given a posttest using the SCAT inventory and the CSAI-2, again one hour before competition.

Once the pretest and posttest results were recorded for each group, an anlysis of data was performed. It was hypothesized that the treatment group would improve over the control group by lowering anxiety levels and increasing self-confidence.

Analysis of variance was performed and revealed no significant difference between the groups for trait anxiety on the pretest; but there did exist a difference in the groups' state anxiety.

Analysis of covariance was utilized to determine which of the four components benefited from the imagery program: trait anxiety,

cognitive state anxiety, somatic state anxiety or state self-confidence. As hypothesized, the treatment group did show improvement in lowering state anxiety, specifically the cognitive and somatic components. The investigation did not show significant improvement in lowering trait anxiety or increasing state self-confidence, though there appeared to be a trend towards improved self-confidence (refer to Graph 4).

Results from this investigation demonstrate the effectiveness of a mental imagery program on reducing state anxiety levels of high school wrestlers. Therefore, if educators, athletes and coaches are trying to gain an advantage, the use of imagery to alleviate stress may be a solution.

CONCLUSIONS

1. State anxiety can be lowered with the utilization of an imagery program, specifically cognitive and somatic components.
2. Trait anxiety was not significantly effected by the imagery program in the short term.
3. State self-confidence, though not significantly affected, showed a tendency towards improvement.

Factors for consideration that may have a relationship to the results of the investigation are imagery ability, experience, confidentiality, and motivation. The first factor which should be discussed, is the consideration of imagery ability. This investigation attempted to motivate the subjects to increase their imagery ability,

but did not measure the imagery ability of the subjects. Clark (1960), found that some subjects were unable to control their images and therefore, did not benefit at all from a mental imagery program. Subjects in this investigation, may also have been unable to effectively control their images. Without control of their images, the subjects may have had difficulty visualizing the intended stress reduction program. Therefore, some subjects may have benefited more than others from the imagery program because of inherent ability. Along with this factor, is past wrestling experiences. Those subjects who had experienced match situations may be more capable of visualizing the situation than the novice wrestler. Past studies have indicated that experienced subjects benefited more from imagery than novices (Corbin, 1967 and Feltz and Landers, 1983). It is difficult to visualize a situation you have not experienced first hand. If, in fact, experienced subjects do gain more from mental imagery than non-experienced subjects, the results may have been affected.

Another consideration is confidentiality of the groups. Though both groups were sworn to secrecy, the investigator could not guarantee confidentiality. Both groups shared practice and locker room areas for the entire season. There is a possibility that some control subjects may have acquired information helpful in reducing stress from the treatment group.

The third consideration was the subjects' past experiences in regards to controlling anxiety. The selection process for grouping was utilized to eliminate this problem. In addition, analysis of variance revealed no significant difference between groups at the start of the investigation. Therefore, it can be assumed that both groups were relatively equal at the onset.

A final issue that should be discussed is subject motivation. It is obvious that some subjects are naturally more motivated than others. Some subjects responded very seriously to the mental imagery program, while others did not. As an investigator, every possible step was taken to eliminate motivational problems. The subjects were constantly encouraged to practice the imagery program on their own. A self-evaluation of their ability was used periodically to help stimulate motivation to increase the subjects ability to visualize. The self-evaluation consisted of rating how well they saw the image, heard the sounds, felt the body movement and felt the mood or emotion of the situation on a questionnaire (refer to Appendix B). Although precautions were taken, there still existed various motivational levels among the subjects.

RECOMMENDATIONS

After the results and conclusions of this research, the following recommendations for further research are suggested.

This investigation concluded that sport competitive trait anxiety did not improve over the short term, however, this investigation did show significant improvement in state anxiety through an imagery program. The sub-categories of state anxiety are the building blocks for trait anxiety. Further investigations need to be applied involving a longer duration of time, in order to discover whether the reduction of state anxiety over an extended period of time will have an effect on trait anxiety.

An additional concern of this investigation was the sub-categories of state anxiety (cognitive and somatic), and how they affect competitive anxiety. Further investigations should be done emphasizing each sub-category separately; in order to investigate whether the sub-categories can be controlled independently of each other.

A third recommendation from this investigation is to determine whether the same results can be obtained with the use of a larger sampling of subjects. A larger sampling may show a significant improvement in state self-confidence not produced in this investigation, since there seems to be a trend towards significance.

A final recommendation is to continue researching methods of reducing sport competitive anxiety to help athletes, coaches, and educators obtain optimal performances without stress disruptors.

APPENDICES

APPENDIX A

Progressive Muscle Relaxation

PROGRESSIVE MUSCLE RELAXATION

(Bernstein and Borkovec, 1973)

(Cycle Begins With Two Contractions Per Muscle Group)

"Lie down on your back."

(Pause)

"Place your arms at your sides in a comfortable position and your feet uncrossed in a position that feels comfortable."

(Pause)

"Try to slow your breathing down--count '1' as you inhale and '2' as you exhale."

(Pause)

"Now focus on the muscles of your dominant arm, when I say go, you will squeeze a fist and contract your bicep and hold. "Make a fist and squeeze--hold the contraction."

(Pause seven seconds)

"Now let go and totally relax your hand and arm. Feel the tension flow out of your muscles. You should feel no tension."

(Pause twenty-five seconds) - (Pause fifty seconds)

"Now focus on the muscles of your non-dominant arm. Make a fist, squeeze and contract your muscles. Concentrate on the contractions."

(Pause seven seconds)

"Now let go, totally relax the muscles of your arm.

Feel the tension leave the muscle."

(Pause twenty-five seconds)-(Pause fifty seconds)

"Now we're going to do the same with your neck. Try to press your chin down to your chest while at the same time resisting. Now contract. Hold."

(Pause seven seconds)

"Now with your face, make a frown as tight as you can and hold."

(Pause seven seconds)

"Relax. Feel your facial muscles become completely relaxed."

(Pause twenty-five seconds) - (Pause fifty seconds)

"Now your shoulders, chest and stomach. Roll your shoulders forward and roll your chest and stomach into a ball. Contract those muscles hard."

(Pause seven seconds)

"Relax. Feel your stomach sink back towards your spine and the tension leave your body."

(Pause twenty-five seconds) - (Pause fifty seconds)

"Next we're going to contract our dominant thigh while lifting our leg slightly and turning our foot inward. Now hold the contraction."

(Pause seven seconds)

"Relax totally and feel yourself becoming very relaxed."

(Pause twenty-five seconds) - (Pause fifty seconds)

"Do the same thing with the non-dominant leg. Ready, now."

(Pause seven seconds)

"Relax. Feel all the tension leave your body while you are relaxed. I want you to close your eyes and concentrate on a soothing environment--sitting on the beach on a sunny day with a nice light blue sky, now riding in a boat and listening to the waves splash by. Concentrate on the light blue sky."

(Pause for two minutes)

"Now slowly open your eyes. You are now ready to take your heart rate."

APPENDIX B

Imagery Assessment Questionnaire

POSTTRAINING SPORT IMAGERY ASSESSMENT QUESTIONNAIRE

This exercise is designed to measure your present imagery skill as it pertains to sport participation. Descriptions for two sport situations will be read to you--first, practicing alone, and then, playing in a contest. You are to imagine the situations and provide as much detail from your imagination as possible to make the image as real as you can. Then you will be aked to rate your imagery on four dimensions:

1. How vividly you saw the image.
2. How clearly you heard the sounds.
3. How vividly you felt the body movements.
4. How clearly you felt the mood or emotions of the situation.

As you listen to each description, think of a specific example in which you are involved--the skill, other people involved, the place, the time, and so forth. Remember that imagery is more than visualizing--try to involve all of the senses.

The rating system is keyed as follows:

1 = very clear and vivid image
2 = moderately clear and vivid image
3 = not clear or vivid, but recognizable image
4 = vague image
5 = no image present

The scale was adapted from one developed by Martens (1980).

ASSESSMENT

Practicing alone (circle the appropriate rating)

1.	Rate how well you saw yourself in this situation.	1	2	3	4	5
2.	Rate how well you heard the sounds of doing the activity.	1	2	3	4	5
3.	Rate how well you felt yourself making the movement.	1	2	3	4	5
4.	Rate how well you were aware of you mood and emotions.	1	2	3	4	5

Playing in a contest (circle the appropriate rating)

1.	Rate how well you saw yourself in this situation.	1	2	3	4	5
2.	Rate how well you heard the sounds of doing the activity.	1	2	3	4	5
3.	Rate how well you felt yourself making the movements.	1	2	3	4	5
4.	Rate how well you were aware of your mood and emotions.	1	2	3	4	5

SCORING

Sum the ratings for both of your answers to 1, then both of your answers to 2, and so on, recording them in the proper space below. Total the scores for the four rating dimensions and record the total.

1. Visual
2. Auditory
3. Kinesthetic
4. Mood

TOTAL =

APPENDIX C

Sport Competitive Anxiety Test

Competitive State Anxiety Inventory-2

: _____ Age:

CTIONS: Below are some statements about how persons feel when they compete in sports and s. Read each statement and decide if you HARDLY-EVER, or SOMETIMES, or OFTEN feel this way you compete in sports and games. If your choice is HARDLY-EVER, blacken the square labeled f your choice is SOMETIMES, blacken the square labeled B, and if your choice is OFTEN, black square labeled C. There are no right or wrong answers. Do not spend too much time on any o ement. Remember to choose the word that describes how you <u>usually</u> feel when competing in ts and games.

	Hardly-Ever	Sometimes	Often
Competing against others is socially enjoyable.	[ ] A	[ ] B	[ ] C
Before I compete I feel uneasy	[ ] A	[ ] B	[ ] C
Before I compete I worry about not performing well.	[ ] A	[ ] B	[ ] C
I am a good sportsman when I compete.	[ ] A	[ ] B	[ ] C
When I compete I worry about making mistakes.	[ ] A	[ ] B	[ ] C
Before I compete I am calm.	[ ] A	[ ] B	[ ] C
Setting a goal is important when competing.	[ ] A	[ ] B	[ ] C
Before I compete I get a queasy feeling in my stomach.	[ ] A	[ ] B	[ ] C
Just before competing I notice my heart beats faster than usual.	[ ] A	[ ] B	[ ] C
I like to compete in games that demand considerable physical energy.	[ ] A	[ ] B	[ ] C
Before I compete I feel relaxed.	[ ] A	[ ] B	[ ] C
Before I compete I am nervous.	[ ] A	[ ] B	[ ] C
Team sports are more exciting than individual sports.	[ ] A	[ ] B	[ ] C
I get nervous wanting to start the game.	[ ] A	[ ] B	[ ] C
Before I compete I usually get up-tight.	[ ] A	[ ] B	[ ] C

ILLINOIS SELF-EVALUATION QUESTIONNAIRE

Name: _____ Date:

Directions: A number of statements which 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 choose the answer which describes your feelings right now.

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

APPENDIX D

Imagery Topics and Control Group's Tapes

Imagery Topics

1. Prematch Mental Preparation the night before a match.
2. Sustaining effort in a fatiguing match with a close score.
3. Mental match preparation.
4. Dealing with precompetitive anxiety.
5. Feeling relaxed and confident before the match.
6. Sustaining momentum in a match.
7. [illegible]oring points at the end of a tough match.
8. Improving match confidence.
9. Wrestling an opponent that you previously were defeated by.
10. Wrestling an opponent that you previously defeated.
11. Staying relaxed in an emotional contest, until your match time.
12. Takedowns in critical match situations.

Control Group's Tapes

1. New York State Wrestling Championship, 1990 @ 145 lbs. Final
2. Monroe County Wrestling League Championship, 1989; Finals Tapes I & II.
3. High Crotch and Fireman carry series; John Leone, State University College at Brockport, 1988.
4. NCAA Wrestling Tournament, 1987; ABC Sports
5. Pinning tape No. III, Leg Wrestling by Wade Schalles, Dynasports, Ltd.
6. PIAA State Wrestling Championship, 1983.

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