THE EFFECT OF INDIVIDUALIZED, NON-INDIVIDUALIZED, AND PACKAGE COGNITIVE INTERVENTION STRATEGIES ON KARATE PERFORMANCE

DISSERTATION

Presented to the Graduate Council of the North Texas State University in Partial Fulfillment of the Requirements

For the Degree of

DOCTOR OF PHILOSOPHY

By

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Denton, Texas
December, 1983

The purpose of the present investigation was to determine the effectiveness of individualized, non-individualized, and package cognitive intervention strategies on karate performance. Subjects were 43 male volunteer students enrolled in karate classes at North Texas State University. They were randomly assigned to one of five experimental groups including an individualized, non-individualized, package, placebo control, and control condition. The data were collected through performance evaluations which were administered during the fifth, tenth, and fifteenth weeks of classes. The physical performance evaluation consisted of dependent measures including skill, combinations, sparring, flexibility, and muscular endurance.

Psychological dependent measures included state anxiety, SCAT, the CSAI-2, and an attentional profile measure. All groups received handouts, mini-strategies, manipulation checks and interviews, in order to aid them in the practice and training of their cognitive strategies. In addition, all subjects were required to practice their cognitive strategies
at home for 10 minutes each day. Therefore, over the 15-week period, subjects spent a minimum of 17 total hours practicing their cognitive strategies. All dependent measures were analyzed by a 5 (treatment) by 2 (trial) multivariate analysis of variance. Results showed that there were no significant differences between groups on any of the dependent variables except for combinations and sparring where the individualized group and package group performed significantly better than the yolked group (non-individualized), control group, and placebo control group.

These results are supported by Desiderato and Miller (1979), Meyers and Schleser (1980) and Silva (1981) who have demonstrated that individualized cognitive intervention was beneficial to athletic performance. In addition, support for the package group has been demonstrated by Dewitt (1980), and Kirchenbaum and Bale (1980) who found that when subjects chose their own strategies from a package format they performed significantly better over the experimental period. Therefore, future investigations should individualize cognitive intervention strategies to the needs of athletes utilizing a suitable packaging format and measuring performance frequently on a valid and reliable scale.
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CHAPTER I

INTRODUCTION

Recently there has been increased attention given to the body-mind relationship in sport. An athlete may spend hours physically preparing to improve his or her subsequent performance, and this physical training may aid in the transfer of skill from the practice field to the performance event. However, there is general agreement that mental practice can also have a positive influence in the acquisition or the performance of a skill (Suinn, 1981). For example, Corbin (1972) defines mental practice as, "the repetition of a task, without observable movement, with the specific intent of learning" (p. 94). As such, this definition broadly describes any type of covert practice or imagery rehearsal, including simply thinking through a physical movement.

An outgrowth of mental practice which has been developed in the last decade is systematic cognitive intervention techniques. For example these techniques [e.g., visuo-motor behavior rehearsal (VMBR), stress inoculation training (SIT), and cognitive behavior modification (CBM)] have been shown to enhance the transfer of skill from the practice session to the actual performance event in a number of case studies (Epstein, 1980; Lane, 1980; Suinn, 1979) and a few
experimental studies (Kolonay, 1977; Noel, 1980; Weinberg, Seabourne, & Jackson, 1980).

Unfortunately, in many instances, mental training techniques have not been prescribed specifically for the needs of the athlete. For example, many coaches may teach their players a relaxation technique in an attempt to improve team performance. However, this technique may help some of the anxious players on the team but may have been unnecessary for others who were capable of controlling their anxiety. This leads to the question concerning whether an individually prescribed cognitive strategy is more beneficial to an athlete than the same strategy applied to an individual whose background in sport demonstrates no apparent need for the strategy. Therefore, one purpose of the present investigation was to determine whether cognitive strategies designed specifically for individuals were more beneficial to their performance than the same strategies given to other individuals, but not individually tailored.

Along these lines an athlete may find a particular cognitive strategy very beneficial to his or her performance while another athlete may prefer a different approach (Silva, 1981). Therefore, it has been proposed that multiple strategies presented in a cafeteria style format may engage athletes to choose their own type of preparation, thereby taking responsibility to utilize a more personalized technique (Mahoney, 1974). In addition, the mere utilization
of the term "package" may have an effect on the athlete's motivation to adhere to and practice the technique (D'Zurilla & Goldfried, 1971; Mahoney, 1974). Therefore, another purpose of the present investigation was to determine whether individually prescribed cognitive strategies are more beneficial to karate performance than cognitive strategies administered in a package approach.

Finally, the effect of individualized and packaged cognitive strategies on karate performance may be mediated by variables such as state-trait anxiety. For example, Meichenbaum and Cameron (1974) suggest that the manner in which an athlete perceives, imagines, and copes with the anxiety inherent in competitive sport situations will likely affect the outcome of that situation. Therefore, another purpose of the present investigation was to examine the relationship of state-trait anxiety and karate performance.

Thus, the purposes of the present investigation are

1. to determine whether cognitive strategies designed specifically for individuals were more beneficial to their performance than the same strategies given to others but not individually tailored;

2. to determine whether individually prescribed cognitive strategies are more beneficial to karate performance than cognitive strategies administered in a package approach;

3. to examine the relationship of state-trait anxiety and karate performance.
CHAPTER REFERENCES


CHAPTER II

REVIEW OF LITERATURE

For many years, improving athletic performance had been predominantly thought to be a function of physical practice. The physical practice of skills relating to a particular sport seemed to be the most effective way to enhance performance in that sport. Consequently, athletes trained many hours drilling and practicing in order to hone down the specific skills needed to improve their performance. Recently, however, athletes are realizing the importance of combining mental and physical practice in order to achieve peak performance. Practitioners of the martial arts (Lee, 1975; Leonard, 1975) and other authors (Gallway, 1976; Herrigal, 1971) have described how unity of the mind and body may lead to enhanced athletic performance. Therefore, athletes are beginning to spend time practicing physical skills, but with the addition and integration of cognitive intervention strategies such as self-statement modification, arousal regulation, attentional focus, and imagery (Mahoney, 1977). Suinn (1981) notes that these "cognitive strategies" may be practiced on a daily basis just as physical skills are systematically practiced. This could enhance the transfer of performance from the training field to the actual event.
Before these cognitive strategies are discussed in detail, the theoretical basis of mental preparation will be presented along with the historical research on mental practice.

Theoretical Basis of Mental Preparation

The use of mental preparation for the improvement of sports skills is a relatively new concept which has its roots dating back to the late 1800's with early theorists attempting to discover the relationship between cognitions and observable behavior. For example, James (1965) stated that our thoughts mediate our behavior; overt acts are simply a chain of stimulus and responses being affected by our experiences and expectations. Based on this idea, Wolpe (1958) developed a technique where his phobic patients used covert rehearsal to change their overt responses to certain stimuli. Other researchers (Atkinson & Wickens, 1971; Bauer & Craighead, 1979; Lang, 1979; Meichenbaum & Cameron, 1974) also demonstrated that an individual's thoughts are related to, and can initiate, physiological reactions, expectancies of behavior outcomes, and overt behavior responses. For example, Cautela (1977) has explained these processes by using covert reinforcement techniques, including covert positive reinforcement, covert negative reinforcement, covert punishment, covert extinction, and covert modeling. These covert reinforcement techniques may be extremely useful in order to change behavior and improve performance expectancies (Cautela, 1977). Other advantages of practicing covert
reinforcement techniques include an increased sense of control, the ability to modify inappropriate covert images or dialogue which may contribute to an undesired overt response, and the development of rational coping skills facilitated by repeated covert rehearsal of overt strategies (Meichenbaum, 1977).

Covert strategies based on the theoretical framework of Cautela (1977), Meichenbaum (1977), and Wolpe (1958) have been developed into mental practice techniques which have been designed to improve motor performance. Singer (1971) describes different mental practice techniques such as the subjects imagining themselves performing their skills, thinking through the various aspects of the skill, watching their skill via films of demonstration, reading about the skill, or having someone else read to them about the skill. These different types of mental practice techniques were not clearly identified in early research. In fact, the designs were predominantly pretest post-test with the intervening variables being mental practice (MP), physical practice (PP) or no practice (NP). For example, the studies prior to 1940 were mostly "ideational or symbolic" in nature (Sackett, 1935) without the perceptual motor components involved in skill acquisition. After 1940, however, studies were specifically designed to test the effects of mental practice on the learning and performance of motor skills. Since then, a multitude of studies involving the effects of
mental preparation on skill performance have been systematically reviewed by several authors (Corbin, 1972; Oxendine, 1968; Richardson, 1976a, 1976b; Weinberg, 1981). Thus, a few noteworthy studies will be presented to illustrate the type of research in this area, rather than attempting an in-depth review.

Early Studies

One of the first mental practice studies was designed to test the effects of MP versus PP on maze tracing performance (Sackett, 1934). All subjects were required to learn a finger maze and then trace it successfully without errors, twice in succession. The PP group was instructed to draw the maze from memory five times each evening. The MP group was told to mentally rehearse going through the maze five times each evening, and think about it as often as possible. The NP group was told not to think about the maze, or draw it until the one week experimental period was terminated. After the one week session, retention was assessed, indicating that the PP group had better retention than the MP group; however, the MP group demonstrated greater retention than the NP group.

Another study designed to test the effects of mental practice on the learning of a motor skill was conducted by Vandell, Davis and Clungston (1943). Subjects were matched on age, intelligence, motor ability, and physique, and then
divided into a MP group, PP group, or NP group. The two tasks employed were free throw shooting and dart throwing. Results showed that both the PP and the MP groups demonstrated increased performance over the 20 day experimental period although no statistical tests were utilized to validate this contention.

Variables Affecting Mental Practice

Vandell's et al. (1943) study sparked the way for other studies which investigated the effects of mental practice on skilled performance taking into account a variety of variables. Several of these variables will be discussed in terms of their relationship to MP and motor performance.

Skill Level

For example, Clark (1960) used different ability groups to determine if skill level in a task was an important variable in the effectiveness of mental practice. The three ability groups were varsity, junior varsity, and novice students. Using imagery techniques for the foul shot, the students were urged to recognize the specific motions involved, then view themselves performing the successive motions, and to close their eyes and feel the sensations of performing the task. Results indicated a positive effect of mental and physical practice on skill acquisition, an increase in subjects' ability to adapt to imagery techniques,
and a greater degree of effectiveness in mental practice at the higher skill level (Clark, 1960).

Another study supporting the correlation between high ability level and increased mental practice effects was conducted by Noel (1980). Results showed that there was a marginally significant improvement in the higher ability VMBR group's percentage of good first serves, while the lower ability group decreased in their performance.

However, the results of a meta analysis concerning the effects of MP on a variety of tasks (Feltz & Landers, 1983) demonstrated no significant differences (p > .18) between higher ability and lower ability performers when averaged across tasks varying in cognitive elements. Their conclusions show that mental practice effects are found in both the initial and later stages of learning.

Nevertheless, it does appear that a minimal amount of experience on a task is necessary for MP to be effective (Corbin, 1967; Schramm, 1967). For example, in Corbin's (1967) study, subjects who had no prior physical practice on a task had no significant improvement in performance following mental practice. In a follow-up study (Corbin, 1976) the same subjects were first exposed to PP followed by MP and in this case, the MP subjects demonstrated significant improvement in performance. Therefore, MP may be valuable to performance in either early or later learning, but more importantly, MP is valuable if the subjects have had at
least a minimal amount of experience in the skill (Weinberg, 1981).

Combination of PP and MP

Another variable which has been shown to be significant in the area of mental practice is the effect of different combinations of MP and PP on performance. For example, White, Ashton and Lewis (1979) conducted a study testing the effects of physical practice and mental practice on the action-reaction swimming start. Subjects were randomly assigned to three groups, including a PP condition, MP condition, or a combined PP and MP condition. The MP group used imagery rehearsal via detailed instruction charts which illustrated the skill, and they were required to use their imagery technique daily for 5 minutes. Results showed that the physical-mental practice group demonstrated the greatest improvement in performance. Furthermore, physical or mental practice alone also resulted in significantly enhanced performance compared to the control group which showed no change.

Another study (Whitely, 1962) found that alternating MP and PP was more effective in enhancing task performance than either PP or MP alone. Therefore, it seems that some combination of MP and PP is more beneficial in enhancing task performance when compared to either MP or PP alone. Furthermore, PP has been shown to be superior to MP;
however, MP is more beneficial than NP (Sackett, 1934). In addition, concerning some tasks that are physically fatiguing, MP can be interspersed between the PP sessions in order to aid performance (Weinberg, 1981).

**MP Time Schedules**

A third variable that has been examined in the sport psychology literature is the amount of time for MP as well as the number of MP sessions required to enhance task performance. One study (Twinning, 1949) divided subjects into three groups which performed a ring toss task for accuracy. The MP group complained that after approximately 5 minutes of mental training, they began to lose concentration concerning their cognitive strategy. This loss of concentration suggested that there may have been a certain amount of time to mentally practice in order to optimize performance benefits.

However, not until Shick (1970) conducted a study on volleyball performance, was any further information available concerning how much time to mentally practice. Specifically, Shick (1970) found that mental practice improved the volleyball serve depending on the amount of time that the subjects employed their mental practice procedure. In particular, 3 minutes of mental practice was found to be significantly more effective in enhancing volleyball serve performance than 1 minute of mental practice.
Therefore, mental practice seems to be most beneficial when prescribed for some optimal length of time. However, Weinberg (1981) notes that this optimum length of mental practice time may vary with the person and the performance task. Furthermore, the interaction between the amount of mental practice time along with the number of mental practice sessions may be a significant variable with regard to enhancing task performance. However, the literature thus far has ignored this issue, as mental practice sessions have ranged from 1 day to a few weeks (Weinberg, 1981).

In summary, while an impressive number of studies utilizing mental practice techniques demonstrated improved performance in motor activities, there is a body of literature (Corbin, 1967; Gilmore & Stolurow, 1951; Smyth, 1975) which showed no differences between the MP and PP groups. Some methodological problems found in the early mental practice literature included no manipulation checks concerning the subjects actual utilization of their cognitive strategy, lack of placebo control groups to nullify the Hawthorne effect, no controls for individual differences in skill level, and relatively short periods of mental practice time (3 to 30 minutes) (Silva, 1981; Weinberg, 1981). Furthermore, two problems which consistently permeated the early MP literature were 1) the limited individualization of the MP technique to meet the needs of the subject and 2) the lack of situation-specific intervention strategies for
the subjects' performance event. In essence, the MP strategies were global in nature, without addressing the particular problems of the individual (Silva, 1981).

**Individualized Cognitive Strategies**

These global nonspecific cognitive strategies soon paved the way for techniques designed specifically for the individual. Several of these individualized cognitive strategies have helped athletes to deal with excess anxiety (Bell, 1976), problems in attentional focus (Nideffer, 1976), and other specific cognitive maladaptations (Meichenbaum & Cameron, 1974; Silva, 1981). Thus, a few of these techniques which range from simple relaxation training to integrated cognitive rehearsal strategies will be presented.

Relaxation training (Benson, 1975; Jacobson, 1932) has been shown to decrease many physiological parameters including muscle tension, heart rate, and respiration. In addition, athletes have used relaxation techniques to alleviate pre-competitive anxiety and to gain control over specific muscles used in competition (Suinn, 1981). Furthermore, relaxation may be the initial step in other cognitive strategies such as imagery, visuo-motor behavior rehearsal (VMBR), stress inoculation training (SIT), and cognitive behavior modification (CBM).

Relaxation has been shown to aid athletes in coping with anxiety; however, another problem that athletes suffer
from is negative covert verbalization. That is, an athlete may let maladaptive thoughts feed on themselves (i.e., "I'm tired; I'm cramping up") creating physiological problems (Meichenbaum, 1977), and ultimately leading to a decrease in performance. Therefore, a thought stopping technique (Cautela, 1977) and a self statement reversal strategy (Mahoney, 1977) enable athletes to change negative ruminations into positive corrective action.

Another covert rehearsal strategy which has been shown to enhance performance is mental imagery (Mahoney, 1977). for example, athletes imagine their impending performance from their own perspective (internal imagery); or viewing the event from the perspective of the audience (external imagery). Investigations (Ryan & Simons, 1981) are currently attempting to determine which type of imagery may be more beneficial to performance; or whether other factors such as stimulus and response proposition (Lang, 1979) may be significant.

A combination of relaxation training and imagery rehearsal termed VMBR has recently received increased attention in the sport psychology literature. "VMBR is a well controlled copy of experience, a sort of body thinking, similar to the powerful illusions of certain dreams at night" (Suinn, 1976, p. 40). Numerous case studies (Suinn, 1976; Suinn & Andrews, 1978) and experimental studies (Noel, 1980; Weinberg, et al., 1981) have demonstrated the effectiveness of VMBR in improving athletic performance.
Another technique, CBM, differs from VMBR in that emphasis is placed on cognitive restructuring and self-instructional imagery. For example, dysfunctional thought patterns of athletes are identified and replaced by appropriate self-talk and imagery. These programs are individually tailored to accommodate athletes thought patterns in order to modify maladaptive cognitions by restructuring them into adaptive cognitive chains (Silva, 1981).

Another cognitive strategy designed for individuals use is SIT (Meichenbaum, 1977). The SIT approach consists of three phases: education, rehearsal, and application. Each of these phases involves a number of components. Components of the educational phase include the rationale for understanding stress and looking at stress in a series of stages. Phase two, rehearsal, consists of the athlete practicing physical coping skills and cognitive restructuring techniques. The final stage, application, includes the use of coping imagery in order to change maladaptive thoughts into adaptive cognitions (Jaremko, 1979).

Studies Supporting Individualized Cognitive Intervention

Several studies (Desiderato & Miller, 1979; Meyers & Schleser, 1980; Silva, 1981) have attempted to help athletes improve their performance using the CBM technique. For example, Desiderato and Miller (1979) designed a CBM program for a competitive tennis player. Prior to intervention, the
subject had won only 29% of her deuce games. Following the CBM program, the subject won 60% of her deuce games showing an increase of 31% of deuce games won after intervention.

Similarly, Meyers and Schleser (1980) taught CBM to a collegiate basketball player who was having trouble concentrating on his foul shooting. The athlete practiced relaxation, imagery, and coping self instructions for seven sessions over a three week period. Results indicated a significant increase in field goal percentage from pre-intervention (42.4%) to post intervention (65.6%).

Silva (1981) used an individually tailored CBM intervention technique to improve hockey performance which employed three stages. State one involved identifying the specific performance problem of the athlete and then establishing specific behavioral and situational boundaries for the problem. After the boundaries of the problem had been established, the athlete was asked to express any covert verbalizations that may have occurred before, during, or after, a bad physical performance. This led to stage two which involved restructuring the athletes maladaptive covert verbalizations. The third phase paired adaptive and coping self-instruction. Results showed that the subject reduced his penalty box time from 4.72 minutes to 2.20 minutes per game.
Studies Utilizing Non-Individualized Cognitive Intervention

Unfortunately in many instances, cognitive strategies have not been individually tailored to athletes. Coaches sometimes present global cognitive strategies to a team where only a few of the athletes may benefit. For example, a coach may provide an entire team with relaxation training techniques which may prove to be effective for the high anxious players, but useless or detrimental to those who had previously maintained an optimum level of arousal. In addition, an empirical study (Bennett & Stothart, 1979) tested the effects of a specific cognitive strategy on non-specific cognitive problems relating to athletic performance. Biofeedback training and practice served as the independent variable while performance in archery was the dependent variable. Results indicated that muscle tension levels could be significantly reduced with biofeedback. However, there failed to be any significant performance differences among the biofeedback training groups. The general conclusion was that reduction in electromyographic tension levels was not accompanied by increases in archery performance.

Another study conducted by Meyers, Schleser, Cooke and Cuvillier (1979) tested the effectiveness of cognitive strategies on gymnastics performance. Female subjects were recruited from a local YMCA program and were then assigned to one of four treatment groups: 1) positive self
instruction, 2) coping instruction, 3) negative instruction, 4) neutral self-talk. Subjects practiced their cognitive strategy along with their physical skills for 2 to 4 weeks. Results showed that no significant differences were found between groups for the front-flip and the front-walkover performance test. Therefore, it was concluded that no single cognitive strategy was more valuable to performance than another strategy.

In conclusion, research in the area of individualized cognitive intervention techniques has been shown to be beneficial to skill performance when the needs of the athlete are taken into consideration. However, studies which did not individualize the cognitive strategies to the needs of the athletes tend to find no significant performance effects. However, there has been a dearth of investigations specifically designed to determine the effects of an individualized program versus the same program which is not tailored to the specific needs of the athlete. Therefore, one purpose of the present investigation was to determine whether an intervention program designed specifically for individuals will be more beneficial to their performance than the same strategies given to others, but not individually tailored.

**Package Approach to Cognitive Intervention**

Individual cognitive strategies have generally been shown to enhance athletic performance if the needs of the
athlete are taken into consideration. Sometimes these individual cognitive strategies have been combined into a package approach and then administered to subjects. The package approach provides a number of strategies that may be used in a cafeteria style format. That is, the subjects choose the cognitive strategies within the package that they feel may aid their performance. Some writers (e.g., D'Zurilla & Goldfried, 1971; Mahoney, 1974) suggest that the characteristics of the packaging format itself may be important in affecting performance. For example, Horan, et al. (1977) used Melzack's model of the psychological aspects of pain (Melzack, 1973) in reducing laboratory induced pain from a cold pressor. They trained subjects in using cognitive strategies such as distraction somatization, in-vivo emotive imagery, transformation of the pain, and transformation of the context. Subjects were then permitted to use any of these cognitive strategies in order to attempt to handle the pain from the cold pressor. However, it was difficult to determine which strategies were used by the subjects as well as which ones were effective.

Another package which has been used in both psychology and sport psychology is a combination of CBM techniques. For example, De Witt (1980) conducted a study with members of a male college basketball team. Subjects were randomly assigned to a treatment group or control group. The treatment group attended 11 one-hour sessions learning relaxation,
imagery, coping techniques, thought stopping, and other psychological skills. Pre-intervention performance was compared with post-intervention performance for both the treatment and control group. Results indicated a significant reduction in EMG and heart rate levels of the treatment subjects over the 11-session period. Subjects receiving the package program also increased in performance ratings while control subjects showed no gain in performance over the same time interval.

Another study conducted by Kirchenbaum and Bale (1980) examined the effects of a broad based psychological training program which included relaxation, imagery, self-monitoring, and positive self-instruction. Subjects were three varsity golfers who had no previous experience with cognitive strategy training. Because of the small sample size (N = 3), a multiple baseline was relied upon. Following intervention, all three subjects showed at least a one stroke improvement over an 18 hole golf course. The authors concluded that the limited improvement in performance may have been a function of insufficient cognitive practice time since the program consisted of one instructional session, followed later by three follow-up meetings. However, a "one stroke differential in mean 18 hole performance separated Jack Nicklaus from a player who earned $100,000 less than Nicklaus in 1976" (p. 336).
There has also been a study using a package approach which demonstrated no performance benefits. Bennett and Stoithart (1978) used stress inoculation training and VMBR to practice cognitive controls over anxiety. Subjects were 44 athletes in gymnastics, archery, wrestling and badminton. Control subjects spent an equal time engaged in tasks unrelated to stress control, or sports performance, such as card sorting. Training consisted of seven sessions. Results showed no significant differences across groups for Spielberger's (1966) state-trait anxiety inventory or performance.

Again, there have been both positive and negative findings concerning the effects of cognitive strategy package approaches on athletic performance. Methodological problems such as limited time of practice and a "ceiling effect" for higher level athletes may have contributed to the lack of findings. In addition, concerning the studies where significant improvements were found in the experimental groups, it could not be determined which part of the package did in fact contribute to performance enhancement. Therefore, another purpose of the present investigation was to determine the effectiveness of a package cognitive intervention approach versus individually prescribed cognitive strategies.
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CHAPTER III

METHODS

Subjects and Design

Subjects consisted of male college students (N = 43) enrolled in beginning karate classes at North Texas State University for the Spring semester of 1983. Volunteers from the classes were required to read a cover letter and sign an informed consent form (see Appendix A) before participating in the experiment. Furthermore, all subjects were randomly assigned to an individually tailored cognitive strategy group, a yoked group (i.e., a group where each subject is taught the same cognitive strategy as his or her counterpart in the tailored group), a package group using Suinn's "The Seven Steps to Peak Performance"* (see Appendix B), or a placebo control group. The subjects then were informed that they would not be permitted to share any information that they received concerning their cognitive strategies. In addition, the students who were not involved in the experiment served as a control group as they also were required to participate in the data collection. Data were also collected on the female students; however, due to their attrition rate, it was not possible to include them in the analysis.

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General Procedures

Performance Evaluations

During the fifth week, tenth week, and fifteenth week of classes (weeks 1 through 5 provided a baseline for physical practice only), the subjects in the experiment along with the rest of the class were given performance evaluations. The purpose of the first performance test administered during week 5 was to check for any initial differences between groups. This test, which measured skill, combinations, and sparring, was shown to be both reliable and valid in previous investigations (Weinberg, Seabourne, & Jackson, 1981) with an inter-rater reliability coefficient of .90. However, after closer examination, a more specific scale was constructed which broke down skill, combinations, and sparring into component parts. Therefore for the last two evaluations, this revised testing instrument was utilized in order to provide more definitive assessment for measuring subjects' performance. These final two tests served to measure differences in performance within and between groups. Each test consisted of a 1-hour session in which five subjects were rated at one time by a second degree black belt karate instructor who was blind to experimental conditions. The rater scored each subject's performance on a 5-point Likert scale. For example, when the subjects were being tested on a single skill technique such as the reverse punch, each of the five subjects performed the punch 10
times consecutively. Skill, combinations, and sparring all were broken down into form, intensity, power, flexibility and effectiveness (see Appendix C).

Inter-rater reliability between the rater and the instructor was shown to be .93 for skill, .90 for combination, and .95 for sparring. For example, as the student performed the reverse punch, he was required to twist the hip at the final moment of the extension of the punch (form). He was to make a fist with his punching hand, cock it under his armpit, extend it, bring it back to under his armpit, and relax. Throughout the punch, he remained as relaxed as possible not letting other muscles interfere with the action of the punch. Finally, speed and power was measured according to the snap which was produced by the punch. Dependent variables included single techniques, combinations, sparring, flexibility, and muscular endurance. Combinations consisted of the subject performing single skill techniques in rapid succession as rated by the second degree black belt rater. Sparring involved each subject using skill and combination techniques in a competitive setting with the instructor for a 1-minute time period. Flexibility of the hamstring and groin muscle was assessed using the Leighton Flexometer which has been shown to be both a valid and reliable measuring instrument (Leighton, 1966). In addition, muscular endurance of the abdominal region was measured using the 2 minute situp test (Wilmore, 1977). Finally, dependent psychological
measures included (Martens, 1976) Competitive Sport Anxiety Inventory 2 (see Appendix D) and Spielberger's (1966) state anxiety test (see Appendix E) which were administered just prior to each performance test; and Nideffer's (1976) Test of Attentional Style (Appendix F), and Martens' (1976) Sport Competitive Anxiety Test (see Appendix B) given during the fifth week and the final week of classes. These inventories were administered in order to investigate the relationship between state anxiety and performance. That is, they were not utilized for implementation of subjects' cognitive intervention techniques. A post-experimental questionnaire was given the last day of classes in order to assess the subjects' thoughts and feelings concerning their cognitive strategies (see Appendix H).

Interview and Needs Assessment

All groups.--Following the performance test given week five, a needs assessment (see Appendix I) was administered to each subject. Each subject completed the seven page needs assessment at home and turned it in during the next scheduled class session. At this session each subject signed up for an individual 1-hour interview with the instructor. During this 1-hour structured oral interview (see Appendix J) the instructor, having reviewed the completed written needs assessment, attempted to discover any problems or difficulties the subject was having concerning
the mental aspects of karate. Finally, each subject was encouraged to spend time discussing his or her cognitive strategy practice with the instructor.

Individually tailored group.--Directly following the interview, the experimenter and the subject pursued "The Seven Steps to Peak Performance" manual in order for them to determine which cognitive strategy or strategies may be valuable to improving karate performance. The instructor then taught the appropriate cognitive strategies to the subject in a step-by-step approach and answered any questions the subject had concerning the utilization of the techniques. In addition, the experimenter took the subject through an actual cognitive strategy practice session. Furthermore, the instructor taught each subject a 1-minute mini-technique of the strategy as presented in the manual to be utilized just prior to performance. This mini-technique may be valuable in the moments just before competition as a final preparation for the event. Finally, the subject received a handout from "The Seven Steps to Peak Performance" concerning the directions for use of his or her individual cognitive strategy. The handout also contained manipulation checks and a log to be completed each day after the 10-minute cognitive strategy home practice session.

Yolked group.--Directly following the individual interview, each subject in the yolked group was provided with the
same material as his or her counterpart in the individually tailored group. However, the strategies presented to the members of the yolked group may or may not have had any relationship to the information presented in their needs assessment. For example, if a subject in the individually tailored group was instructed in a relaxation technique from "The Seven Steps to Peak Performance," then so would the randomly assigned counterpart in the yolked group. In addition, the subject in the yolked group was taken through an actual relaxation training session and mini-technique. Furthermore, just as the subject in the individually tailored group received a handout, manipulation checks, directions for 10 minutes of home practice, and a log, so did the counterpart subject in the yolked group.

**Package group.**--Due to the length of the strategies presented in "The Seven Steps to Peak Performance," the package group met for one session outside of class in order to be introduced to the technique. Following this initial general learning session, each subject met with the instructor on an individual basis for the interview. Following the interview, the instructor took each subject through an actual experiential session of each of the steps in "The Seven Steps to Peak Performance." In addition, each subject learned a mini-version of each strategy to be used where applicable prior to performance. Finally, the subjects received "The
Seven Steps to Peak Performance" manual along with manipulation checks, and a log to be filled out daily after the 10-minute home cognitive strategy practice session.

**Placebo control group.**--Following the individual interviews, each subject was exposed to quotations from early Chinese writings. The experimenter pointed out that these quotations (see Appendix K) contain philosophies of how to deal with pain and tribulation, and must be memorized and understood in order to weather the trials of karate training. Therefore, the subjects were allowed to ask questions about the meanings of the quotes as well as relating their own philosophy to the writings. Furthermore, a mini-strategy was utilized as the subjects let one of the quotes be repeated within the mind for a 1-minute time period. Finally, the subjects received a handout concerning their cognitive strategy along with manipulation checks and a log to be filled out each day after the 10-minute home cognitive strategy practice session.

**Second Interview**

**All groups.**--Following the second performance test (week 10) each subject was again interviewed by the instructor for 1 hour. The purpose of the interview was to further explore the progress of the subjects concerning their cognitive strategy. Furthermore, all subjects were required to take a written test concerning their ability to perform the
cognitive strategies (see Appendix L). With the additional information gained from this second interview, subjects continued their cognitive strategy practice until the final performance test which was administered during the fifteenth week of classes.

**Individually tailored group.**--Members of the individually tailored group were interviewed and assessed concerning the possibility of utilizing additional strategies for improving their karate performance. Other strategies from "The Seven Steps to Peak Performance" were learned; or, a more complete exploration of the subjects' original techniques were practiced. In any case, the instructor did his utmost to see that the subjects gained as much as possible from "The Seven Steps to Peak Performance."

**Yolked group.**--Following the interviews, members of the yolked group received the same strategies or reinforcement as their counterparts in the individually tailored group. For example, if a subject in the individually tailored group received visuo-motor behavior rehearsal, so did the counterpart in this yolked group.

**Package group.**--Following the interviews, subjects discussed questions or problems that they were having with "The Seven Steps to Peak Performance." In addition, the instructor took the subjects through an actual practice
session of the strategies in order to upgrade the quality of their training.

**Placebo control group.**--Following the interview, each member had the opportunity to philosophize and ask questions concerning the Chinese quotations. Discussions were led by the instructor concerning the beneficial effects that the teachings of early oriental sages may have on karate performance.

**Class Procedures**

Each class met Mondays, Wednesdays, and Fridays or Tuesdays and Thursdays for 3 hours per week. Random assignment of subjects were made independent of class times. At the beginning of each session, the instructor asked subjects to use the 1-minute mini-version of their cognitive strategy to prepare for training. All subjects sat cross-legged, with their eyes closed as they performed their mental technique. Students who were not involved in the experiment practiced a simple low abdomen breathing exercise. Additionally, just prior to training on different aspects of physical performance (e.g., skill, combinations, sparring, muscular endurance, flexibility) the subjects again were provided 1 minute in order to practice their cognitive strategy. At the end of each class period, the subjects were required to practice their cognitive strategy for 5 minutes with their eyes closed, in a sitting position. Furthermore, during the
eleventh week and the fifteenth week, the subjects were required to turn in their logs and manipulation checks to the instructor. Finally, a post-experimental questionnaire concerning the subjects' feelings about their cognitive strategy was completed the last day of class.

In summary, subjects spent 3 hours per week for 15 weeks actually attending classes. Of these 45 hours of class time, subjects spent approximately 3.5 hours out of the 10-week experimental session actively practicing their cognitive strategies under the supervision of the instructor. Furthermore, 10 minutes of daily home practice along with two 1-hour interviews resulted in a minimum of 17 hours of cognitive strategy practice over the 15-week session for each subject.
CHAPTER REFERENCES


CHAPTER IV

RESULTS

Manipulation Checks

All experimental subjects were required to keep a personal written log concerning the practice and training of their cognitive strategies. The format of the logs varied in style. Some ranged from simple numerical descriptions of levels of arousal and vividness of imagery, to elaborate well defined analyses of thoughts and feelings. Many of the subjects wrote that they found their cognitive strategy practice interesting as well as valuable to their karate performance.

In addition, all experimental subjects were required to complete manipulation checks to verify the utilization of their cognitive strategies. Subjects reported their frequency of practice, duration of practice sessions, along with their feelings concerning the value of their cognitive training. In general, the manipulation checks demonstrated that subjects experienced a moderate to high degree of success in the practice and training of their cognitive strategies. Furthermore, they felt that this mental training was valuable tool for enhancing their karate performance. Following is a description of the questions found in the manipulation checks found in each of the experimental groups. Each
The following questions are presented along with the means for each experimental group.

1. "How many times per week do you practice your technique?" from (1) once a week to (11) everyday. Results indicated a significant main effect $F(3, 26) = 3.75, p < .05$, and Newman Keuls' post hoc tests revealed that the individualized group ($M = 8.1$) practiced significantly more than the yolked group ($M = 4.0$) and the package group ($M = 5.2$).

2. "Do you feel comfortable (familiar) with your technique?" from (1) uncomfortable to (11) very comfortable. There were no significant differences between groups and the grand mean score was 7.9.

3. "Did you understand the instructor's explanation and comments concerning your strategy?" from (1) not at all to (11) very much so. There were no significant differences between groups and the grand mean score was 8.4.

4. "How many minutes per day do you practice your technique?" from (1) 1 minute or less to (11) 10 minutes. There were no significant differences between groups and the grand mean score was 5.5.

5. "Do you feel that this technique is aiding your karate performance?" from (1) not at all to (11) helping
extremely much. There were no significant differences between groups and the grand mean score was 7.7.

6. "Do you feel that your cognitive strategy would benefit other performers in other sports?" from (1) not at all to (11) very much so. There were no significant differences between groups and the grand mean score was 9.0.

Overview of Statistical Procedures

This section presents an analysis of the data compiled in the present investigation. Karate performance, muscular endurance, flexibility, anxiety measures, and attentional profile data were analyzed using separate multivariate analyses of variances (MANOVA). If significance was found, appropriate post hoc procedures were utilized. In addition, Pearson Product Moment Correlations were utilized to determine the relationship between dependent variables. The alpha level was set at .05. The data were analyzed by the IBM Model 50 Computer System at the North Texas State University.

Pretest

A pretest was administered during week 5 in order to establish a performance baseline as well as to test for any significant differences between groups. Dependent variables included skill, combinations, sparring, muscular endurance, state anxiety, and competitive state anxiety. Results of
one-way ANOVA's showed that there were no significant differences between groups on any of the dependent variables.

**Karate Performance**

A 5 (treatment) by 2 (trials) MANOVA was conducted using karate skill, combinations, and sparring as the dependent variables. Results indicated a significant overall multivariate treatment main effect $F(12, 95) = 3.09, p < .01$. No other main effects or interactions reached significance. Four separate post hoc analyses were conducted to examine the treatment main effect. The first procedure used multivariate deviation contrasts to determine the potential differences between the treatment conditions and group centroids. Results showed that the individualized $F(3, 36) = 4.08, p < .01$ and packaged groups $F(3, 36) = 3.08, p < .05$, performed significantly better than the means of the grand centroid. In addition, the yolked group performed significantly less than the grand centroid $F(3, 36) = 4.08, p < .001$. Finally, the placebo control condition did not differ significantly from the mean of the grand centroid.

To determine how the treatment groups differed from one another on the dependent variables, regression contrasts were conducted. The independent variable (i.e., treatment conditions) was transformed into a coded vector to determine the relationship between the vector and the dependent variables (Kerlinger & Pedhazar, 1973). In particular, the first
regression contrast analysis was performed on the individualized (1) versus the package group (-1) and results revealed that there were no significant differences between the two treatment conditions. The next regression contrasted the package (3) and individualized (3) groups versus the placebo control (-2), control (-2) and placebo control (-2) groups. Results indicated a significant difference $F(6,36) = 4.30, p < .01$ with the package and individual groups performing better than the other three groups.

To further examine the relationship between each dependent variable and the significant effect described above (i.e., individual and package groups were better than all other groups) skill, combination, and sparring measures were correlated with this significant treatment effect. Results showed that the relationships between skill, combinations and sparring performance and the significant main effect were significant, although the strongest relationships were seen in combinations and sparring performance. These correlations are presented in Table I.

The final post hoc procedure was to conduct 5 (treatment) by 2 (trials) univariate ANOVA's for skill, combinations, and sparring. Results for combinations and sparring on both measurements reached significance, supporting the preceding analyses, in that the individualized and package groups performed significantly better in terms of sparring performance and combinations than all of the other groups.
TABLE I
CORRELATION BETWEEN DEPENDENT KARATE PERFORMANCE VARIABLES AND TREATMENT EFFECT

<table>
<thead>
<tr>
<th>Variable</th>
<th>Correlation</th>
<th>P values</th>
<th>dF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skill 1</td>
<td>.38</td>
<td>.006</td>
<td>4, 38</td>
</tr>
<tr>
<td>Skill 2</td>
<td>.27</td>
<td>.03</td>
<td>4, 38</td>
</tr>
<tr>
<td>Comb 1</td>
<td>.51</td>
<td>.001</td>
<td>4, 38</td>
</tr>
<tr>
<td>Comb 2</td>
<td>.51</td>
<td>.001</td>
<td>4, 38</td>
</tr>
<tr>
<td>Spar 1</td>
<td>.52</td>
<td>.001</td>
<td>4, 38</td>
</tr>
<tr>
<td>Spar 2</td>
<td>.44</td>
<td>.001</td>
<td>4, 38</td>
</tr>
</tbody>
</table>

Skill performance, however, showed only a trend toward significance. The univariate ANOVA's for karate performance dependent variables are presented in Table II.

TABLE II
UNIVARIATE ANOVA FOR KARATE PERFORMANCE DEPENDENT VARIABLES*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Hypoth. SS</th>
<th>Error SS</th>
<th>Hypoth. MS</th>
<th>Error MS</th>
<th>F</th>
<th>Sig. F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skill 1</td>
<td>52.12</td>
<td>239.50</td>
<td>13.03</td>
<td>6.30</td>
<td>2.06</td>
<td>.104</td>
</tr>
<tr>
<td>Skill 2</td>
<td>23.20</td>
<td>116.47</td>
<td>5.80</td>
<td>3.06</td>
<td>1.89</td>
<td>.132</td>
</tr>
<tr>
<td>Comb 1</td>
<td>73.56</td>
<td>159.17</td>
<td>18.39</td>
<td>4.18</td>
<td>4.39</td>
<td>.005</td>
</tr>
<tr>
<td>Comb 2</td>
<td>45.18</td>
<td>76.72</td>
<td>11.29</td>
<td>2.01</td>
<td>5.59</td>
<td>.001</td>
</tr>
<tr>
<td>Spar 1</td>
<td>44.70</td>
<td>77.94</td>
<td>11.17</td>
<td>2.03</td>
<td>5.49</td>
<td>.001</td>
</tr>
<tr>
<td>Spar 2</td>
<td>27.06</td>
<td>80.79</td>
<td>6.76</td>
<td>2.12</td>
<td>3.18</td>
<td>.024</td>
</tr>
</tbody>
</table>

*Degrees of freedom = (4, 38)
In addition, means and standard deviations for skill, combinations, and sparring are presented in Table III.

Muscular Endurance and Flexibility

Separate 5 (treatment) by 3 (trials) repeated measures MANOVA’s on muscular endurance (situps, roundhouse kicks) and 5 (treatment) by 2 (trials) repeated measures MANOVA on flexibility (hamstring, groin) indicated no significant treatment main effects or interactions. However, there was a significant trials effect for situps $F(1,38) = 45.78$, $p < .001$ demonstrating a significant improvement from trial 1 ($M = 73.04$) to trial 2 ($M = 79.27$). In addition, there was a significant trials effect for roundhouse kicks $F(1,38) = 77.75$, $p < .001$ with a significant gain in performance from trial 1 ($M = 118.72$) to trial 2 ($M = 171.53$). Although flexibility measures were administered only during weeks 10 and 15, results for hamstring flexibility significantly improved $F(1,38) = 70.24$, $p < .001$ from trial 1 ($M = 133.72$) to trial 2 ($M = 149.25$), and results for groin flexibility also showed a significant improvement $F(1,38) = 116.57$, $p < .001$ from trial 1 ($M = 130.76$) to trial 2 ($M = 144.46$). Means and standard deviations for situps and roundhouse kicks are presented in Table IV and hamstring and groin flexibility in Table V.
TABLE III
MEANS AND STANDARD DEVIATIONS FOR SKILL, COMBINATIONS AND SPARRING*

<table>
<thead>
<tr>
<th>Treatment Group</th>
<th>Skill 1</th>
<th>Skill 2</th>
<th>Comb. 1</th>
<th>Comb. 2</th>
<th>Spar. 1</th>
<th>Spar. 2</th>
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<td></td>
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<td>Mean</td>
<td>S.D.</td>
<td>Mean</td>
<td>S.D.</td>
</tr>
<tr>
<td>Individualized</td>
<td>13.75</td>
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<td>12.75</td>
<td>1.58</td>
<td>13.50</td>
<td>1.30</td>
</tr>
<tr>
<td>Packaged</td>
<td>12.62</td>
<td>3.58</td>
<td>13.00</td>
<td>2.07</td>
<td>12.62</td>
<td>2.50</td>
</tr>
<tr>
<td>Yolked</td>
<td>11.75</td>
<td>1.48</td>
<td>12.37</td>
<td>1.68</td>
<td>11.37</td>
<td>1.68</td>
</tr>
<tr>
<td>Placebo Control</td>
<td>10.57</td>
<td>2.22</td>
<td>10.71</td>
<td>1.79</td>
<td>10.74</td>
<td>1.97</td>
</tr>
<tr>
<td>Control</td>
<td>11.09</td>
<td>2.81</td>
<td>12.16</td>
<td>1.64</td>
<td>10.00</td>
<td>2.33</td>
</tr>
<tr>
<td>Total</td>
<td>11.91</td>
<td>2.63</td>
<td>12.23</td>
<td>1.82</td>
<td>11.51</td>
<td>2.35</td>
</tr>
</tbody>
</table>

*High scores demonstrate better performance.
TABLE IV
MEANS AND STANDARD DEVIATIONS FOR MUSCULAR ENDURANCE*

<table>
<thead>
<tr>
<th>Treatment Group</th>
<th>Sit-Ups 1</th>
<th></th>
<th>Sit-Ups 2</th>
<th></th>
<th>Sit-Ups 3</th>
<th></th>
<th>R. Kicks 1</th>
<th></th>
<th>R. Kicks 2</th>
<th></th>
<th>R. Kicks 3</th>
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<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>S.D.</td>
<td>Mean</td>
<td>S.D.</td>
<td>Mean</td>
<td>S.D.</td>
<td>Mean</td>
<td>S.D.</td>
<td>Mean</td>
<td>S.D.</td>
<td>Mean</td>
<td>S.D.</td>
</tr>
<tr>
<td>Individualized</td>
<td>75.75</td>
<td>16.91</td>
<td>81.62</td>
<td>15.36</td>
<td>85.25</td>
<td>18.08</td>
<td>134.87</td>
<td>56.59</td>
<td>179.12</td>
<td>64.98</td>
<td>250.87</td>
<td>70.33</td>
</tr>
<tr>
<td>Yolked</td>
<td>72.50</td>
<td>22.07</td>
<td>78.50</td>
<td>18.36</td>
<td>86.37</td>
<td>20.85</td>
<td>90.37</td>
<td>40.60</td>
<td>135.75</td>
<td>24.60</td>
<td>175.75</td>
<td>33.70</td>
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<tr>
<td>Packaged</td>
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<td>9.68</td>
<td>78.25</td>
<td>9.08</td>
<td>83.12</td>
<td>16.26</td>
<td>113.12</td>
<td>42.62</td>
<td>165.62</td>
<td>33.31</td>
<td>195.62</td>
<td>69.75</td>
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<tr>
<td>Placebo Control</td>
<td>70.14</td>
<td>12.11</td>
<td>81.71</td>
<td>15.14</td>
<td>87.71</td>
<td>14.25</td>
<td>152.42</td>
<td>77.83</td>
<td>213.57</td>
<td>57.49</td>
<td>219.85</td>
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<td>Total</td>
<td>73.04</td>
<td>15.45</td>
<td>79.27</td>
<td>13.31</td>
<td>83.62</td>
<td>15.66</td>
<td>118.72</td>
<td>51.71</td>
<td>171.53</td>
<td>49.80</td>
<td>209.51</td>
<td>67.45</td>
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</table>

*High scores demonstrate better performance.
<table>
<thead>
<tr>
<th>Treatment Group</th>
<th>Hamstring 1</th>
<th></th>
<th>Hamstring 2</th>
<th></th>
<th>Groin 1</th>
<th></th>
<th>Groin 2</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>S.D.</td>
<td>Mean</td>
<td>S.D.</td>
<td>Mean</td>
<td>S.D.</td>
<td>Mean</td>
<td>S.D.</td>
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<tr>
<td>Individualized</td>
<td>136.12</td>
<td>16.93</td>
<td>156.12</td>
<td>9.40</td>
<td>133.87</td>
<td>12.36</td>
<td>150.75</td>
<td>12.71</td>
</tr>
<tr>
<td>Yolked</td>
<td>127.50</td>
<td>11.33</td>
<td>143.00</td>
<td>9.75</td>
<td>130.62</td>
<td>12.30</td>
<td>140.12</td>
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<tr>
<td>Packaged</td>
<td>143.87</td>
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<td>155.00</td>
<td>14.63</td>
<td>136.62</td>
<td>14.70</td>
<td>148.25</td>
<td>14.01</td>
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<tr>
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<td>118.57</td>
<td>18.39</td>
<td>139.85</td>
<td>17.56</td>
<td>118.28</td>
<td>13.17</td>
<td>137.00</td>
<td>13.61</td>
</tr>
<tr>
<td>Control</td>
<td>138.33</td>
<td>24.40</td>
<td>150.50</td>
<td>18.50</td>
<td>132.16</td>
<td>20.13</td>
<td>145.00</td>
<td>18.34</td>
</tr>
<tr>
<td>Total</td>
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<td>19.51</td>
<td>149.25</td>
<td>15.42</td>
<td>130.76</td>
<td>15.89</td>
<td>144.46</td>
<td>14.70</td>
</tr>
</tbody>
</table>

*Scores reflect the angle of the tibia in relation to a vertical axis with higher scores demonstrating greater flexibility.*
Anxiety

Three anxiety tests were administered (i.e., state anxiety, the CSAI-2 and SCAT) and analyzed by a 5 (treatment) by 2 (trials) MANOVA. Results showed that there were no significant main effects or interactions for these anxiety measures. The means and standard deviations are presented in Table VI for state anxiety and SCAT, and Table VII for the CSAI-2.

Attention

Attentional data were measured by the TAIS using the OIT and BIT subscales. Attentional data were analyzed by a 5 (treatment) by 2 (trials) ANOVA with the results demonstrating a significant trials effect for the BIT subscale $F(1,26) = 12.35, p < .05$ with subjects demonstrating a decrease in their ability to cope with stimuli from trial 1 ($M = 27.80$) to trial 2 ($M = 26.00$). Means and standard deviations are presented in Table VIII.
### TABLE VI

**Means and Standard Deviations for the Sport Competitive Anxiety Test and State Anxiety**

<table>
<thead>
<tr>
<th>Treatment Group</th>
<th>SCAT 1</th>
<th></th>
<th>SCAT 2</th>
<th></th>
<th>State A 1</th>
<th></th>
<th>State A 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
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<td>Mean</td>
<td>S.D.</td>
<td>Mean</td>
<td>S.D.</td>
<td>Mean</td>
<td>S.D.</td>
</tr>
<tr>
<td>Individualized</td>
<td>20.00</td>
<td>3.58</td>
<td>17.37</td>
<td>4.43</td>
<td>16.75</td>
<td>4.59</td>
<td>15.75</td>
<td>4.68</td>
</tr>
<tr>
<td>Yolked</td>
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<td>4.83</td>
<td>17.50</td>
<td>3.81</td>
<td>18.75</td>
<td>5.23</td>
<td>17.12</td>
<td>4.51</td>
</tr>
<tr>
<td>Packaged</td>
<td>19.00</td>
<td>4.56</td>
<td>15.12</td>
<td>2.10</td>
<td>17.37</td>
<td>4.50</td>
<td>15.75</td>
<td>6.98</td>
</tr>
<tr>
<td>Placebo Control</td>
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<td>3.15</td>
<td>17.00</td>
<td>2.16</td>
<td>22.00</td>
<td>4.39</td>
<td>19.57</td>
<td>7.29</td>
</tr>
<tr>
<td>Control</td>
<td>20.80</td>
<td>3.55</td>
<td>18.50</td>
<td>5.35</td>
<td>17.60</td>
<td>4.71</td>
<td>18.10</td>
<td>6.19</td>
</tr>
<tr>
<td>Total</td>
<td>19.65</td>
<td>3.86</td>
<td>17.17</td>
<td>3.90</td>
<td>18.36</td>
<td>4.81</td>
<td>19.73</td>
<td>7.29</td>
</tr>
</tbody>
</table>

*Possible scores for the SCAT may range from a low anxiety score (10) to a high anxiety score (30). The range of scores for the state anxiety are from a low anxiety score (10) to a high anxiety score (40).*
<table>
<thead>
<tr>
<th>Treatment Group</th>
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<th>Cognitive 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individualized</td>
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<td>5.04</td>
<td>S.D. 3.53</td>
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<tr>
<td></td>
<td>15.75</td>
<td>4.06</td>
<td>S.D. 4.85</td>
</tr>
<tr>
<td></td>
<td>15.12</td>
<td>3.69</td>
<td>S.D. 2.53</td>
</tr>
<tr>
<td></td>
<td>20.57</td>
<td>8.36</td>
<td>S.D. 3.62</td>
</tr>
<tr>
<td></td>
<td>19.39</td>
<td>5.26</td>
<td>S.D. 6.32</td>
</tr>
<tr>
<td>Yoked</td>
<td>17.90</td>
<td>5.54</td>
<td>S.D. 5.37</td>
</tr>
<tr>
<td></td>
<td>17.90</td>
<td>5.37</td>
<td>S.D. 4.71</td>
</tr>
<tr>
<td>Total</td>
<td>15.65</td>
<td>5.54</td>
<td>S.D. 4.71</td>
</tr>
</tbody>
</table>

**TABLE VII**

**MEANS AND STANDARD DEVIATIONS FOR COGNITIVE, SOMATIC AND CONFIDENCE VARIABLES OF THE CSA-1-2**
<table>
<thead>
<tr>
<th>Treatment Group</th>
<th>Somatic 1</th>
<th></th>
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<td></td>
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<td>Mean</td>
<td>S.D.</td>
<td>Mean</td>
<td>S.D.</td>
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<td>4.94</td>
<td>14.75</td>
<td>5.17</td>
</tr>
<tr>
<td>Yolked</td>
<td>16.87</td>
<td>5.81</td>
<td>14.75</td>
<td>3.57</td>
<td>14.00</td>
<td>4.00</td>
</tr>
<tr>
<td>Packaged</td>
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<td>3.75</td>
<td>15.00</td>
<td>3.81</td>
<td>13.25</td>
<td>2.54</td>
</tr>
<tr>
<td>Placebo Control</td>
<td>15.42</td>
<td>5.12</td>
<td>17.14</td>
<td>4.74</td>
<td>14.00</td>
<td>3.21</td>
</tr>
<tr>
<td>Control</td>
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<td>5.99</td>
<td>16.08</td>
<td>4.33</td>
<td>13.50</td>
<td>3.45</td>
</tr>
<tr>
<td>Total</td>
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<td>5.09</td>
<td>15.83</td>
<td>4.18</td>
<td>13.86</td>
<td>3.61</td>
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### TABLE VII--Continued

<table>
<thead>
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<td>Mean</td>
<td>S.D.</td>
<td>Mean</td>
<td>S.D.</td>
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<td>28.37</td>
<td>4.34</td>
<td>27.87</td>
<td>5.33</td>
</tr>
<tr>
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<td>24.87</td>
<td>5.40</td>
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<tr>
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<td>5.04</td>
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<tr>
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<td>25.28</td>
<td>3.77</td>
<td>26.85</td>
<td>5.61</td>
</tr>
<tr>
<td>Control</td>
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<td>5.51</td>
<td>24.08</td>
<td>4.79</td>
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<td>7.22</td>
</tr>
<tr>
<td>Total</td>
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<td>5.93</td>
<td>25.83</td>
<td>4.80</td>
<td>26.95</td>
<td>5.98</td>
</tr>
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</table>

*The range of scores for the CSA1-2 subscale may be from a low anxiety score (9) to a high anxiety score (36).*

55
**TABLE VIII**

MEANS AND STANDARD DEVIATIONS FOR THE ATTENTIONAL PROFILE OF THE SUBJECTS*

<table>
<thead>
<tr>
<th>Treatment Group</th>
<th>OIT 1</th>
<th>OIT 2</th>
<th>BIT 1</th>
<th>BIT 2</th>
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<tbody>
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<td></td>
<td>Mean</td>
<td>S.D.</td>
<td>Mean</td>
<td>S.D.</td>
</tr>
<tr>
<td>Individualized</td>
<td>23.37</td>
<td>5.42</td>
<td>22.00</td>
<td>4.69</td>
</tr>
<tr>
<td>Yolked</td>
<td>23.62</td>
<td>4.27</td>
<td>22.75</td>
<td>3.10</td>
</tr>
<tr>
<td>Packaged</td>
<td>24.00</td>
<td>6.87</td>
<td>22.28</td>
<td>4.30</td>
</tr>
<tr>
<td>Placebo Control</td>
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<td>2.22</td>
<td>24.42</td>
<td>3.90</td>
</tr>
<tr>
<td>Control</td>
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<td>.</td>
<td>21.00</td>
<td>.</td>
</tr>
<tr>
<td>Total</td>
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<td>4.67</td>
<td>22.77</td>
<td>3.88</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*High OIT scores connote an overload in the subjects' attentional demands while lower scores show that the subjects are able to handle increased stimuli. High BIT scores show that the subjects can effectively handle increased attentional stimuli while lower scores demonstrate an inability to process stimuli effectively.*
CHAPTER REFERENCES

CHAPTER V

DISCUSSION

Karate Performance

Results from the present investigation indicated that the individualized group performed significantly better in karate performance than the yolked group, placebo control group, and control group. These results are supported by Desiderato and Miller (1979), Meyers and Schleser (1980), and Silva (1981), who have demonstrated that individualized cognitive intervention is beneficial to athletic performance. In these studies, CBM techniques were utilized based on the specific needs of the athletes. The CBM programs were developed following a thorough needs assessment administered prior to intervention. For example, Silva (1981) employed three stages in using cognitive intervention to improve a hockey player's performance. Stage one required the subject to establish behavioral and situational boundaries in order to pinpoint specific performance problems. In addition, the subject acted out any covert verbalizations which may have preceded or followed a poor performance. Stage two involved aiding the subject in restructuring maladaptive covert verbalizations into positive self-statements. The third phase paired adaptive and coping instructions. During the 10-game
intervention period, the subjects' penalty time was reduced from 52 minutes to 22 minutes.

To meet the specific needs of the athlete, in the present investigation, the individualized group was given an oral and written needs assessment followed by interviews and instructions concerning cognitive intervention procedures specific to their goals. In addition, manipulation checks, and both formal and informal interviews were utilized to keep abreast of subjects' progress as well as to aid them further in their pursuit of improved karate performance.

The package group also performed significantly better than the yoked group, placebo control group, and control group. These results are supported by De Witt (1980), and Kirchenbaum and Bale (1980) who found that when subjects chose their own strategies from a package format, they performed significantly better over the experimental period. For example, De Witt (1980) presented a cognitive strategy package to basketball players which included relaxation training, imagery rehearsal, coping techniques, and thought stopping. The treatment group practiced their strategies for 11 one-hour sessions. Pre-intervention performance was compared with post intervention performance for both the treatment and control groups. The results demonstrated a significant reduction in EMG and heart rate levels of treatment subjects over the experimental period. In addition, treatment subjects showed a significant gain in performance
while control subjects showed no gain in performance across the 11-session period. Kirchenbaum and Bales' (1980) study with golfers showed similar findings using a broad-based psychological training package including relaxation, imagery, self monitoring, and positive self instruction. Results showed that all subjects receiving the treatment package showed at least a one stroke improvement over an 18 hole golf course.

However, these designs were case study in nature using small N's and lacking in both placebo control and control conditions. Furthermore, there was no attempt made to compare the effects of the treatment intervention with other intervention procedures not specifically designed for the subjects need. These methodological problems are understandable, however, because a coach's ultimate goal is performance improvement regardless of a sound empirical design. For example, in one study, U.S. Olympic skiers served as subjects in which the experimental group received VMBR and the control group did not. "The VMBR technique was so effective that the research study lost the use of its control group when the coach of the team chose to race only the more successful experimental group, rather than the matched control group" (Suinn, 1976, p. 295). Therefore, in the present investigation, 45 subjects were administered cognitive intervention procedures utilizing a placebo control group and a control group. Furthermore, a yoked group was used to find out
whether intervention procedures should be prescribed based on specific needs of subjects, or whether they should be globally administered.

It should be noted that both the package group and individualized group were equally effective concerning their improved karate performance. The individualized selection procedure utilized for both groups may have enabled subjects to gain a sense of responsibility and commitment to their cognitive training. Furthermore, the strategies were presented to subjects in a systematic training approach which may have been an important ingredient for their successful performance. For example, Meichenbaum and Cameron (1974) have demonstrated that the step by step educational and practical approach utilized in SIT may be an integral component to the success of that strategy. Therefore, the individualized approach and the package approach to cognitive intervention both seem to be effective strategies for enhancing performance if they are presented systematically.

In addition, cognitive intervention may be most beneficial to subjects if an initial needs assessment is utilized to aid them in determining which strategies may be most valuable for their performance enhancement. Specifically, the subjects' awareness concerning their needs for particular cognitive strategies may be an important initial step for successful intervention (Silva, 1981). For example, the
yolked groups' cognitive strategy practice was not based on their needs assessment. This lack of integration of the needs assessment and subsequent implementation of cognitive intervention may have contributed to the yolked groups poorer karate performance as compared to the individualized and package groups. This is consistent with previous research (Bennett & Stothart, 1979; Meyers, Schleser, Cook, & Culliver, 1979) who found no significant performance effects for globally prescribed cognitive strategies. That is, when subjects were randomly presented with non-individualized prescriptions, such as relaxation, positive self instruction, coping instruction, negative instruction, or neutral self talk, no significant performance differences were found between treatment conditions. This adds further credence to the notion that cognitive strategies may be more effective if they are designed for the athletes specific needs.

Finally, another important factor which may have added to the increased performance of the individualized and package groups was the packaging format (D'Zurilla & Goldfried, 1971) of the Seven Steps to Peak Performance (see Appendix B). For example, Suinn's Seven Steps to Peak Performance was presented in a logical sequence including a motivation introduction, easily understandable procedures, and utilizable manipulation checks. Each of the seven cognitive strategies presented in the manual was capsulized
into a step by step progression for easy usage. This easily utilizable progression of phases has been discussed in previous research (Meichenbaum & Cameron, 1974; Silva, 1981) as necessary ingredients for the makeup of a successful packaging format. Specifically, the athlete must be able to peruse the package and understand the step by step treatment procedures without having to falter through cumbersome text.

Muscular Endurance and Flexibility

Results showed that there were no significant differences between groups for situps, roundhouse kicks, hamstring flexibility, or groin flexibility. However, all groups improved in these areas over time. A possible reason for the lack of between group differences may have been because the subjects cognitive strategies were geared towards their actual karate performance (i.e., skill, combinations, sparring) with a lesser emphasis on the exercise components of situps, roundhouse kicks, and flexibility training. Therefore, this supports the notion that cognitive intervention strategies may be most efficacious when designed for a specific physical activity are the major determinants of progress for that particular exercise (Wilmore, 1977). For example, the mere physical training provided during each class session may have been the major factor for the general increase in performance for all of the groups. Therefore, in future research, the cognitive strategy instruction
should be specific to all aspects of performance including muscular endurance and flexibility.

Anxiety

Results showed that there were no significant differences between groups for state anxiety, the CSA1-2, or SCAT. A possible explanation for the lack of trait anxiety differences may have been that the experimental period was not of sufficient duration (Martens, 1976). For example, trait anxiety tends to remain stable over time for subjects unless threatening circumstances are introduced (Spielberger, 1966).

Furthermore, the lack of state anxiety findings may be attributed to several factors. First of all, the subjects were not accustomed to the performance test procedure. For example, in class, the subjects practiced their cognitive strategies at specific intervals each day. However, during the performance evaluation, the subjects were required to sit quietly, in lines of five, while one line was taking the test, and another line was practicing their cognitive strategy. Therefore, the sudden change in procedure which was prescribed by the karate instructor, may have been a mediating factor for subjects' anxiety levels.

Another factor which may have contributed to the lack of state anxiety findings was that not all subjects utilized relaxation as part of their cognitive strategy regime.
Indeed, relaxation training was only one of seven steps which may have been administered in the Seven Steps to Peak Performance. Therefore other strategies (i.e., energetic control, concentration training, etc.) were utilized by subjects without particular concern for regulating their anxiety level.

Anxiety and Performance

Results showed that there was no relationship between levels of anxiety and performance in the present investigation. One possible explanation for this lack of findings may have been due to the nature of the dependent performance variables (i.e., skill, combinations, and sparring). For example, Oxendine (1976) matched several sport skills with their optimal level of arousal for peak performance. Those activities high on speed, strength, or endurance, but low on complexity and fine muscle control require a high degree of arousal. Those activities requiring mostly fine muscle control, precision, and coordinated movements require a lower level of arousal for maximum performance. For example, Weinberg and Genuchi's (1980) golf study showed that subjects with low levels of state anxiety and low levels of trait anxiety demonstrated significantly better performance than moderate or high trait anxious golfers. However, it should be noted that in this study, along with others (Bennett & Stothart, 1979; Weinberg, Seabourne, & Jackson, 1981) no attempt was made to discover at what specific anxiety level
individuals may function in order to consistently have their best performance. Specifically, Sonstroem and Bernardo (1982) examined the relationship between intraindividual pregame state anxiety and basketball performance. Results showed that subjects had different optimal state anxiety levels for the same basketball performance task. For example, one player may perform optimally at a lower level of anxiety than another player. Therefore, prior to performance, his state anxiety measure may be determined to be extremely low, while the other players' state anxiety measure may be much higher. That is, not only is there an optimal level of arousal for different sport skills, but this optimal level of arousal may consist of a different value for different individuals (Sonstroem & Bernardo, 1982).

In the present investigation, therefore, two actors must be addressed concerning the anxiety-performance relationship. First of all, karate performance requires different arousal levels for optimal performance depending on the particular skill involved (i.e., skill, combinations, or sparring). However, state anxiety was administered preceding the entire performance test rather than prior to each area of skill, combinations, and sparring. Secondly, individuals may have different optimal anxiety levels in order for them to perform up to their potential. However, intrasubject optimal anxiety levels were not measured due to lack of
previous research in this area prior to beginning this investigation.

Attention

Results for the attentional profile inventory demonstrated no significant differences between groups for the BIT or OIT subscales. However, there was a marginally significant trials effect for the BIT subscale showing that subjects exhibited a decrease in their ability to cope with stimuli over the experimental period.

Conclusions and Recommendations

In conclusion, the major findings from the present study and recommendations for future research are presented.

1. The results of this investigation add support to previous research (De Witt, 1980; Meyers & Schleser, 1980; Silva, 1981) attesting to the importance of individualized cognitive intervention strategies in enhancing performance.

2. The superiority of the package approach to cognitive intervention is also consistent with previous literature (D'Zurilla & Goldfried, 1971; Jaremko, 1979; Meichenbaum, 1977) demonstrating the significance of suitable format and content of the package for improving performance (De Witt, 1980; Kirchenbaum & Bale, 1980).

3. The increased sample size, use of suitable control and yoked groups, and manipulation checks utilized in the present investigation add empirical support to previous case

4. Results indicated no significant anxiety performance relationships. This might be best explained because subjects were required to perform a multitude of performance assessments with only one administration of state anxiety. In addition, intraindividual state anxiety differences for each subject were not taken into account.

5. Future investigations should individualize cognitive intervention strategies to the needs of athletes, utilizing a suitable packaging format and measuring performance frequently on a valid and reliable scale.

6. Areas such as intraindividual anxiety, subjects' desire and predisposition to utilize their cognitive intervention, and differences between novice and elite athletes concerning their needs for cognitive intervention should provide fruitful variables for future research.
CHAPTER REFERENCES


Appendix A

Consent Form Cover Letter

I have freely volunteered to take part in a scientific study being conducted by Tom Seabourne under the supervision of the North Texas State University.

The instructor of my self-defense class, Tom Seabourne, has explained the study to me and I understand the explanation that has been given and what my participation will involve. I will participate in class as well as out of class in learning and practicing a cognitive strategy. I am not permitted to discuss my individualized strategy with any other participant in the study until the end of the semester. Additionally, I understand that this extracurricular training and practice will not influence my grade in this course.

I understand that the results of the study will be treated in strict confidence and that my results will remain anonymous. Within these restrictions, results of the study will be made available to me at my request. However, I understand that my participation in the study does not guarantee any beneficial results to me.

I understand that I am free to discontinue my participation in the study at any time and that at my request, I can receive additional explanation of the study after my participation is completed.
Appendix A

Form 2

USE OF HUMAN SUBJECTS

INFORMED CONSENT

NAME OF SUBJECT: ____________________________________________

1. I hereby give consent to ________________________________ to perform
or supervise the following investigational procedure or treatment:

   __________________________________________________________

2. I have (seen, heard) a clear explanation and understand
the nature and purpose of the procedure or treatment; possible
appropriate alternative procedures that would be advantageous
to me (him, her); and the attendant discomforts or risks
involved and the possibility of complications which might
arise. I have (seen, heard) a clear explanation and under-
stand the benefits to be expected. I understand that the
procedure or treatment to be performed is investigational
and that I may withdraw my consent for my (his, her) status.
With my understanding of this, having received this infor-
mation and satisfactory answers to the questions I have
asked, I voluntarily consent to the procedure or treatment
designated in Paragraph 1 above.

SIGNED: ___________________________  SIGNED: ___________________________
  Witness  Subject
  or

SIGNED: ___________________________
  Witness

DATE: ____________________________

  Person Responsible
  Relationship

Instructions to persons authorized to sign: If the subject
is not competent, the person responsible shall be the legal
appointed guardian or legally authorized representative.
If the subject is a minor under 18 years of age, the person
responsible is the mother or father or legally appointed
guardian. If the subject is unable to write his name, the
following is legally acceptable: John H. (His X Mark)
Doe and two (2) witnesses.
Appendix B

"THE SEVEN STEPS TO PEAK PERFORMANCE"*

Mental Training Manual for Athletes

Richard M. Suinn, Ph.D.

Colorado State University

*Copyrighted 1982 by Richard M. Suinn. All rights reserved. None of the material may be reproduced by any means without written consent of the author.
Using the Manual

This manual was mainly written to give athletes an opportunity to begin training in mental skills. There are several ways of using the manual. The idea would be to first attend a clinic on sports psychology sponsored by your sports association or governing board, where you will be taught some skills covered in this manual. The manual then becomes a means of following up on the direct training experience. Another method would be to use the manual, step-by-step, practicing the skills through the exercises until you have gained control...then moving to the next step. By this method, you would proceed at your own pace through the entire seven steps in the manual. A third approach is to examine the manual with your coach, and together decide which skills are most relevant for your needs. The self-assessment might be helpful in giving direction. You would then orient your mental skills training around those skills you and your coach believe to be most needed by you at this time. In all cases, remember that practice is crucial to acquire the mental skills, and that you should transfer these skills to the practice field or court, and that they should be part of your routine you use on the competitive field or court.

The Author

Richard M. Suinn, Ph.D., is currently team psychologist, U.S. Women's Track and Field, and a psychology consultant to the U.S. Olympic Committee's Elite Athlete Project. He was team psychologist at the 1976 Winter Olympics for the U.S. Olympic Biathlon Team and the U.S. Olympic Nordic Ski Teams. He has developed programs preparing for the 1980 Summer Olympics for the U.S. Women's Athletics teams. He has consulted with the U.S. Modern Pentathlon Team, the U.S. Marksmanship Unit, and the U.S. Alpine Ski Team, as well as individual athletes in a variety of sports. He is currently professor and head of the Department of Psychology at Colorado State University.
Appendix B (Continued)

"THE SEVEN STEPS TO PEAK PERFORMANCE"

TABLE OF CONTENTS

Some Questions and Answers about Sports Psychology

Step 1--
Mental Skill: Relaxation Training

Step 2--
Mental Skill: Stress Management

Step 3--
Mental Skill: Positive Thought Control

Step 4--
Mental Skill: Self-Regulation

Step 5--
Mental Skill: Mental Rehearsal (VMBR)

Step 6--
Mental Skill: Concentration

Step 7--
Mental Skill: Energic Control

Psychological Programming for Peak Performance

Reading List

Evaluation Form
SOME QUESTIONS AND ANSWERS ABOUT SPORTS PSYCHOLOGY

What can sports psychology do for my athletic performance?

Sports psychology has developed across the years to the point that we know more about mental aspects of performance. So far athletes have almost been overeducated on physical factors and undereducated on psychological aspects of training and performance. Yet, we know that your mind can clearly influence your body. The "seven steps to peak performance" are in this manual.

Can you give me some examples of the mental aspects in athletics:

One example is the many ways in which your performance can be disrupted if another competitor manages to disturb your concentration through psyching you out. Another example becomes clear if you recall your personal best...how did it feel: easy? confident? smooth? like you just thought and your body instantly responded? alive? strong? Now compare this with a really bad event...how did that feel: loggy? like you were forcing? distracted? stressed out? unready? thoughts racing? Many of these differences touch on mental characteristics or the smooth flow of mind and body.

Can you teach me how to psych my opponents out?

Mind games don't win events for you, you win the event through your training, your athletic ability, and how good you are in getting your own act together. And getting your act together might include learning how to retain concentration and control even when someone is trying to psych you out.

So what kinds of things does mental training offer?

Training covers relaxation (centering), mental rehearsal, stress management, concentration, self-regulation, positive thought control, and energy control. Where available, programs could include biofeedback, goal setting, team building, group support, and career planning.
Appendix B (Continued)

What things can I learn and do for myself?

This handout will cover some basics that you might find helpful. The major rule is that acquiring skill for these basics to help your performance requires practicing. Training and practice is as important for both physical skills as for mental skills. You cannot expect to develop strength by occasionally using weight training; nor can you expect to develop mental skills without practice. Also, you don't expect to bench press with skill the first time you work out on weights; similarly you should not expect overnight miracles the first time you engage in mental training. Discipline and training works for physical training and for mental training. The payoffs are there for you to reach for.

What will this manual cover?

Several basic mental skills are covered: relaxation, stress management, concentration, positive thought control, self-regulation, mental rehearsal, and energy control. Each includes instructions for learning the skill, a self-assessment, and a training log to measure your progress. Follow the instructions and add these skills to your training routine, and watch the benefits.
Appendix B (Continued)

STEPS TO PEAK PERFORMANCE

--STEP 1--

MENTAL SKILL: RELAXATION TRAINING

Purpose: Being able to relax the body gives the athlete control over muscles important for keeping loose in competition. The feeling of 'flow' is often associated with being loose and easy. Knowing how to relax can also be used if competition or conditions cause a feeling of tense- ness or tightness. Finally, relaxation is often a basic step in other training, such as visualization, some concentration control, some stress management.

STAGE 1 Training - Progressive Relaxation

The trick is to learn relaxation by first learning what tense muscles feel like. Hence, this stage involves your tensing up muscle groups, focusing on what that feels, then letting go, and noticing the contrasting feelings. This exercise should take about 20-30 minutes; use a steady, slow pace without rushing.

Once a day, select a place where it's quiet and you won't be disturbed. It could be at night before going to sleep. Lie on your back, eyes closed.

Tense each muscle group only as long as is required for you to attend to the tension generated; this usually is about 5-8 seconds. These times are approximate, don't distract yourself by paying too much attention to counting or timing. Tense the muscles, notice the tension, then relax.

Begin with dominant hand--clench into a fist, notice the tension (5-8 seconds), release, and notice the contrasting relaxation. Repeat.
Tense the other hand into a fist, then relax. Repeat.
Flex the one arm to flex the biceps, then relax. Repeat.
Flex the other arm, relax. Repeat.
Frown to tense the forehead, relax. Repeat.
Clench jaws tight, relax. Repeat.
Shrug the shoulders for tension, relax. Repeat.
Take a deep breath, hold it to tense; slowly exhale and notice the relaxation. Repeat.
Appendix B (Continued)

Tighten the stomach muscles, relax. Repeat.
Point your toes downward to tense, relax. Repeat.
Take a slow deep breath, drawing in the air by your stomach moving outward; slowly exhale by your stomach moving inward. Repeat a total of three times. Center your attention on this breathing process (we'll call this "centering" in the future). Return to normal breathing.
Whenever you wish to further control your relaxation, return to "centering":
--center your attention on breathing with the stomach to cause relaxation
--scan your muscles to determine if any important tension remains in spots
--use the centered breathing to flow the relaxation to those spots
--now as you continue the centered breathing, visualize each muscle group loosening up one by one (like light bulbs going off one by one).

STAGE 2 Training - Relaxation on Cue

After 3-4 practice sessions using Stage 1, you should be ready for Stage 2, shortening the relaxation to about 5-10 minutes, eliminating tensing, and relying upon the centering technique.

Once again, select a quiet place, and lie on your back with eyes closed.

Use centering:

--focus your attention on centered breathing, 3 deep breath cycles.
--now flow the relaxation through each muscle group--first the dominant hand, then opposite hand, one bicep/arm, other bicep/arm, forehead, jaw, shoulders, chest, stomach, thigh/legs, feet.
--now scan the body to determine if any tension spots remain.
--use centered breathing to flow relaxation to those spots.
--as a final check, continue centered breathing, visualizing each muscle group loosening up (like light bulbs going off one by one).

STAGE 3 Training - On-site Relaxation

After 3-4 practice sessions with Stage 2, you should be able to use centering to achieve relaxation within less
and less time, reducing from 20-30 minutes (Stage 1) to 5-10 minutes (Stage 2). In Stage 3 you should be able to initiate relaxation by centering, and in places other than your quiet room, and without lying down or closing your eyes. You should also be able to achieve relaxation as fast as less than one minute.

Pick a time and place that you feel relaxation will be useful, for example, on the bus to the stadium, or on the field (or in the auditorium) while you’re waiting. You may center while standing or sitting. Initially, you may want to close your eyes for the brief centering exercise; later you may be able to center with your eyes open but not focused on anything specific.

First, center your breathing, with the stomach breathing method.

Next, visualize each muscle group loosening up, like light bulbs going off one by one.

Now, check for any spots that are still tense.

Continue centered breathing to flow relaxation in those spots.

Include some triggering cues as you breathe and relax; experiment to find what works best, e.g., as you breathe and relax, think "I'm loose and relaxed" several times as your cue. Or picture the words "Loose and Calm". Or picture a color that feels relaxing to you, such as deep blue or green. When you discover the cue that seems right, use that along with centering.
Appendix B (Continued)

SELF-ASSESSMENT

Use the scale from "-10" to "+10", with "-10"=extremely tense and "+10"=extremely relaxed. Rate yourself for the following situations:

1. During competition
2. After stretching exercises
3. During good competition performances
4. During poor competition performances
5. When you had your "personal best"

TRAINING LOG

Use from "-10" to "+10" to show your level of relaxation before the relaxation exercise and after.

Stage 1: Progressive Relaxation

<table>
<thead>
<tr>
<th>Date of Practice</th>
<th>Level Before Relaxing</th>
<th>Level After Relaxing</th>
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Stage 2: Relaxation on Cue

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<th>Date of Practice</th>
<th>Level Before Relaxing</th>
<th>Level After Relaxing</th>
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## Appendix B (Continued)

### Stage 3: On-site Relaxation

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<th>Date of Practice</th>
<th>Level Before Relaxing</th>
<th>Level After Relaxing</th>
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Appendix B (Continued)

STEPS TO PEAK PERFORMANCE

--STEP 2--

MENTAL SKILL: STRESS MANAGEMENT

Stress hides in many forms: are you "hyper" before your event? does your mind race? do you find yourself distracted by irrelevant things (noises, thoughts)? do you feel your mind is separate from your body at the start of your event? do you feel uptight and jerky? do you have trouble sleeping? are you easily "psyched" out? are you irritable or emotional?

Many athletes experience a little anxiety before their event that adds to their excitement. However, too much removes concentration, raises the risk of injury, causes negative thoughts, and shows up as loss of coordination, endurance, or smooth performance.

Recognizing stress --

1. Use a scale 0-10 with "0"=no stress, "10"=high tension (stress).
2. Daily, watch for times you know you're under stress, e.g., you have to take a test, or someone is picking on you unfairly (your stress level=around "8", "9", or "10").
3. Pay attention to how your body reacts: do your hands clench? do you grit your teeth? do you start to hunch your shoulders? do you start to swallow, have a dry throat? Everyone has their own body signs ("stress signs"); what are your stress signs?
4. Now, at the next competition (even practice time trials, practice match, etc.), watch for your stress signs--
   a. what level on the stress scale are you the night before competition?
   b. what level on the stress scale are you the morning of competition?
   c. what level on the stress scale are you in the locker room?
   d. what level are you coming on the field (gym)?
   e. what level are you during warm-ups?
   f. what level are you just before your event?
   g. what level are you at the start?
   h. what level are you during the event?
   i. what level are you at the finish?
5. Now, look back at your answers for #4 for this competition and others. Is there a pattern? Are you the most
stressed the moments just before your event? Or at the start? When?

Preventing stress --

1. Learn the relaxation skill through Stage 3.
2. During competition, always practice centered relaxation at the times you discovered are your high stress points (just before your event, at the start, or whenever).
3. Get into the habit of checking your body for "stress signs" to make sure you're staying loose (e.g., check on the ride out, during warm-ups, when you're watching another athlete, before the start, etc.).

If you notice "stress signs" building, immediately go to centered relaxation to lower stress.
Appendix B (Continued)

SELF-ASSESSMENT

Using 0-10, with 10=high stress, 0=no stress, record your stress levels from the last competition:

1. the night before, stress was at ___
2. the morning of, stress was at ___
3. in the locker room, stress was at ___
4. going on the field (gym), stress was at ___
5. during warm-ups, stress was at ___
6. just before your event, stress was at ___
7. at the start, stress was at ___
8. during the event, stress was at ___
9. at the finish, stress was at ___

What are your body's "stress signals"?

- hand clenches
- throat goes dry
- shoulders hunch
- clench teeth
- palms sweat
- frown
- heart rate increases
- neck tenses
- stomach knots
- other

TRAINING LOT

For each competition, remember to use centered relaxation to lower stress. Record below the level of stress you experienced for each competition.

<table>
<thead>
<tr>
<th>Date of Competition</th>
<th>Stress Level (0-10) Before Centering</th>
<th>Stress Level (0-10) After Centering</th>
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Appendix B (Continued)

STEPS TO PEAK PERFORMANCE

--STEP 3--

MENTAL SKILL: POSITIVE THOUGHT CONTROL

Your thoughts influence your actions more than you believe. Think about a situation that really irritates you, and you'll find yourself getting angry. What you do with your thoughts can change your life, and your performance.

Negative Thoughts

Successful and unsuccessful competitors are subject to negative thoughts; what distinguishes the winner from the loser is what you do with the thoughts.

The successful person considers what might go wrong; the unsuccessful person is afraid to pay attention because the thoughts cause negative emotions.

The real secret is to make use of negative thoughts. Most problem thoughts are problems because they feed on themselves, you think, "I'm getting tired, what if I tie up", and this thought leads to fear or tensing, and indeed you perform poorly. Or you think, "I don't feel ready, I don't feel right today, I'm not going to have a good day", and indeed you don't.

But negative thoughts can be put to good use. Instead of letting them feed on themselves, use them to work out a solution. What could you do if you begin to feel too tired to stay in the running in a distance event? (Possibly shorten your stride or your arm swing.) What should you do if you miss in a gymnastic or a skating routine? (Possibly focus your concentration on being smooth throughout the next sequence). So, to make a negative thought into a positive event, you would not avoid the thought, but prepare yourself to use it to trigger a positive and corrective action. If you think, "I'm getting tired and beginning to cramp", you would then immediately act by adjusting your stride. If you make an error in a routine, you would immediately remind yourself, "Stay smooth, here comes the next move, very smooth". (Use the self-assessment to work out your thoughts and corrective actions.)
Appendix B (Continued)

Positive Thoughts

You often hear of persons talking about keeping a positive self-concept. Sometimes this seems hard to do, given life's experiences or a demanding training and competitive schedule. So what can you do?

Value yourself as a person, who also happens to be an athlete.

Always try for the very best out of yourself regardless of conditions (such as weather, how organized the games/match/meet has been, etc.).

Know your stage of development before the competition. What is the best you can expect of yourself, given your stage of training? (It's very hard to not win all the time, but should you have won?)

Develop affirmations during training to remind yourself of your talents, e.g., "I've trained well, I'm ready", "I'm fit and strong", "I'm comfortable and calm", "I've trained mentally and have a mental edge".

Review your progress in your sport, from where you started to how far you've developed. Keep a total outlook to avoid feeling down about temporary letdowns.

As you recall your successful performances, get used to viewing yourself as talented and successful, "That's me, I can be successful; my body can function well with all that training".

Know what you want, what is success for you, what are your reasons for competing and doing well.
Appendix B (Continued)

SELF-ASSESSMENT

Do you have negative thoughts during competition or assessment?

<table>
<thead>
<tr>
<th>Always</th>
<th>Rarely</th>
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<tbody>
<tr>
<td>Often</td>
<td>Never</td>
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<td>Sometimes</td>
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How do they affect your performance?

| Always helps me |
| Always hinders me |
| Sometimes helps, sometimes hinders |
| No effect |

TRAINING LOG

<table>
<thead>
<tr>
<th>List your common negative thoughts in competition</th>
<th>In the future, what should you immediately do if you have this thought?</th>
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State the positive affirmation, and the time during competition or training it would best be used to help your performance:

<table>
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<tr>
<th>Positive thought (affirmation)</th>
<th>Time during competition</th>
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Appendix B (Continued)

STEPS TO PEAK PERFORMANCE

--STEP 4--

MENTAL SKILL: SELF-REGULATION

Self-regulation deals with 'getting psyched up', feeling ready. It involves both that frame of mind of feeling good and up for competing, as well as having body sensations that feel right.

Your mind. Some refer to having 'that winning feeling'. Remember the feeling that surrounded you during your personal best performance? Capturing and controlling this feeling can help establish the winning frame of mind. Here's an exercise:

Pick a competition where you had this 'winning feeling'. Identify when the feeling was there; it might have been present the night before or just when you started warming up.

Do some centering, relaxing yourself.

Now, take yourself back to that competition. Let yourself be flooded with the experience. Gradually pay attention to more and more details of that winning feeling in this order:

1. First, what was the overall feeling like? Loose? Excited? Mentally alert? Feeling "strong"? Goose bumps?
2. Next, think of some phrase you can use to recall this overall feeling. "Personal Best in Nationals"? "The tower-of-strength feeling"? "Unbeatable"?
3. Now, daily, during training, picture that winning feeling again and repeat your phrase. Use this to recreate the winning feeling again in your body.

Your body. Don't be mistaken. If you haven't slept well, or are tired from travel, the loggy feeling in your body won't go away until its rested. However, if "feeling down" is a mental state, then there are steps you can take:

First, using events to get "up":
1. does certain music get your body and mind up?
2. do certain people help you get up?
3. do certain topics (the importance of the event, being a favorite or underdog, who's in the crowd) get you primed?
4. does remembering your goals help you get tuned (using today to better times or distance, going for a win, competing with a sense of freedom of movement, regaining fun?)
Appendix B (Continued)

Secondly, training your body for peak activation:
1. use a scale, where "0"=loggy and "100"=overly excited.
2. in your daily training log, write down the number describing your level of body activation during performances.
3. look at your good performances--what level was your body usually at ("50", "70", "85"?); this tells you your
   optimal arousal level for performing.
4. now, on competition day, check your arousal level before your event. If your optimal level is 80, but today
   you feel it's at 65, then you're too low; or if you feel you're at 95, then you're too high.
5. if you're too low
   --first, alternately tighten and loosen your shoulders, your arms, your legs;
   --secondly, take brisk steps and turns;
   --thirdly, focus on things around you and as quickly as you can, identify the different colors around you as you
   turn your body--what is the first color you see? Turn again, now what do you see?
   --repeat these three exercises in order until you
   have increased your body and mental alertness to your optimum level.
6. if you're too high, then you need to use centering to relax and settle.
Appendix B (Continued)

SELF-ASSESSMENT

"The Winning Feeling"—getting the mind "up"

1. Recall your personal best or when you had the "winning feeling". Describe generally the event, and what this feeling was like.

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

2. Write down a phrase to refer to this winning feeling.

__________________________________________________________________________

"Being Up"—getting the body "up"

1. What helps you feel up:
   music? __yes__ no  What selection?
   certain people? __yes__ no  Who?
   certain topics? __yes__ no  What?
   certain goals? __yes__ no  Which?

2. Rate body arousal level (0-100) and performance during training/competition:

<table>
<thead>
<tr>
<th>Date</th>
<th>0=loggy</th>
<th>100=overly excited</th>
<th>Performance</th>
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<td></td>
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<td>Poor</td>
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<td>Poor</td>
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<td>Good</td>
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Appendix B (Continued)

TRAINING LOG

"The Winning Feeling" -- getting the mind "up"

Did you use your phrase, or otherwise remember that "winning feeling"?

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<tr>
<th>Date of Competition</th>
<th>yes</th>
<th>no</th>
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"Being Up" -- getting the body "up"

Rate your body activation level; did you use the exercises to raise/lower your optimal level?

<table>
<thead>
<tr>
<th>Date of Competition</th>
<th>Your Level (0=100) Before Event</th>
<th>Did you raise/lower to your optimal level?</th>
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STEPS TO PEAK PERFORMANCE

--STEP 5--

MENTAL SKILL: MENTAL REHEARSAL (VMBR)

The use of imagery, or VMBR, is one of the most powerful tools for peak performance. Visualization enables you to program mind and body into a single unit.

VMBR, "visual-motor behavior rehearsal", always involves relaxation followed by visualization of competition. By preparing mind and body before your event, it gives you an extra edge.

VMBR Training. Stage 1

1. Pick a quiet place and time, and sit or lie down comfortably.
2. Use centering to achieve a relaxed state.
3. Now, switch on a scene of a familiar activity or situation that is relaxing for you when you're there. It might be a scene involving listening to a favorite record as you sit on a specific chair in your room, or a specific beach you have visited, etc.
4. Let this scene develop, allow yourself to be there, using any senses that make the experience real for you. Don't try to force the scene; as any details appear, use these details to help the rest of the scene.
5. As you experience this relaxing scene, use it to further increase your relaxation.
6. Now, switch off the scene.
7. Return to centering.
8. Switch on the scene again. Then off. Then center.
9. Repeat.
10. End of training session by moving first hands and feet, then sitting up.

VMBR Training. Stage 2

After about three repeats of Stage 1, you should now be good at centering and visualizing of the relaxation scene. In all scenes, always be there as a participant (inside your body) and not an observer (outside your body).

Pick a quiet place and time. Sit or lie down comfortably.
Appendix B (Continued)

1. Use centering to achieve a relaxed state.
2. Switch on your relaxation scene, let it come realistically.
3. Switch off the relaxation scene.
4. Use centering.
5. Now, switch on a success competition scene, an event in which your body functioned at a peak performance level. Let the scene be real and vivid, and be there again.
6. Switch off the scene and center.
7. Switch on the success scene again, experience the competition, especially how well you are functioning.
8. Switch off scene, center, and end session.

VMBR Training. Stage 3

You are good enough in VMBR now that you can now apply it for different goals:

-One goal is to visualize that competition where you had the "winning feeling". Use the visualization repeatedly until it or your phrase to describe it will produce the "winning feeling" when you want it.

-Another goal is to use VMBR to remove tension if there is a moment in competition when you always get too tense.
  1. Center, then visualize yourself in competition just before that moment.
  2. Keeping the relaxed state, now let the scene progress to that moment.
  3. If you start to feel tension building, use centered breathing until you're in control again.
  4. End scene, center.
  5. Repeat.

-Another goal is to practice a part of your sport (explosive start, running smoothly, accurate throw, extension, a routine, etc.). What you practice may be decided by you and your coach, from video-tape, from biomechanics analysis, etc. The method involves:
  1. Center.
  2. Switch on a competition, visualizing this specific move.
  3. Repeat this rehearsal over and over until you've programmed your body.

-Another goal may be to practice your "keys" or the trigger phrases or attitudes that help you to peak performance. For example, instead of a specific move, you might visualize instead:
Appendix B (Continued)

1. Competing, repeating your key phrase or image, such as "remember, smooth and easy" or "explosive, like a bullet".
2. Competing, emphasizing an attitude such as "aggressive" or "go all out".

- Another goal might be to practice the other mental skills. For example, you could visualize an upcoming competition:
  1. and employing the concentration exercise,
  2. or doing stress management,
  3. or having a negative thought during the event and immediately correcting.

- Another goal can be to practice the upcoming competition over and over until you're so familiar that you have an edge. For example,
  1. practice what you will do under different conditions (different weather, if you're behind, if you've made an error, etc.)
  2. practice the entire event so that it is so familiar that it's as if you've already won it.
  3. practice the success feelings that will be usable if you need that extra motivation when tired--visualize yourself pushing to win...being ahead...and winning.
Appendix B (Continued)

SELF-ASSESSMENT

VMBR Training. Stage 1

Rate how realistic your relaxation visualization was

<table>
<thead>
<tr>
<th>not real</th>
<th>very real</th>
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<td>at all</td>
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VMBR Training. Stage 2

Rate your success competition scene

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<th>not real</th>
<th>very real</th>
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VMBR Training. Stage 3

List what goal in using visualization best helps you reach peak performance?

________________________________________

Describe what you are doing and the scene you would use to achieve your primary goal

________________________________________

________________________________________

________________________________________

TRAINING LOG

<table>
<thead>
<tr>
<th>VMBR scene(s) used for competition</th>
<th>Effect on performance</th>
<th>How can VMBR scenes better help your performance?</th>
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STEPS TO PEAK PERFORMANCE

--STEP 6--

MENTAL SKILL: CONCENTRATION

Concentration is no more than paying attention. Yet sometimes it is a very difficult thing to keep hold of. Part of the reason is because there are different aspects involved in loss of concentration, and you have to find out what aspect is important for you.

Sometimes concentration is lost because attention is grabbed by other events. Some athletes, for example, have their attention immediately captured by the various different things going on. They notice the crowd noises and wonder what's happening, they hear the different advice by the coach, they attend to the various athletes -- and find it hard to focus in on preparing for the event itself.

If this describes your situation, then a routine for controlling and directing your concentration should help:

When you first step in to the stadium/auditorium, deliberately look at broad things -- gaze at the crowd around you, let the sounds surround you, get impressions of color.

Next, focus on the spectators in the lowest row, and "search" to see four basic colors--can you see any red? can you see any blues? any green? any yellow?

Now, bring your concentration closer, by attending to the field (or the playing floor)--let your eyes move along the outer edges as you start in one spot, scan toward the corner, then follow the complete length until you're back where you started.

Next, bring your concentration to the area right next to you--what colors can you identify of the four? any red? blue? green? yellow?

Now, pay attention to yourself. Do some centered breathing for a moment, using this to focus on your stomach area.

Now, initiate relaxation. Scan for tight muscle spots. Loosen each, like light bulbs one by one.

Next, go to a brief mental rehearsal of your event.
Appendix B (Continued)

If you start to become distracted again by something that catches your attention:
--be sure to slow your actions down--move slowly, talk slowly, look around you slowly
--go to centering and relaxing, let your eyes look into the distance on nothing special, continue centering
--then use mental rehearsal

Sometimes 'losing concentration' really means:
--You're under stress, tense: if so, then use stress management
--You're being distracted: if so, go alone to a quiet spot, slow down, and use centering.
--You're responding to someone psyching you out: if so, remember that persons who resort to this are desperate to win; so look back at them kindly, and think about your own affirmations.
--You're too attentive to negative thoughts: if so, use the "Positive Thought Control" exercise.
Appendix B (Continued)

SELF-ASSESSMENT

Rate yourself on what your attention is like during competition.

My concentration is weak; I'm distracted
My concentration fades, sometimes focused, sometimes drifts
I can keep focused on my surroundings that are relevant to performance (e.g., the net, the bar, the ball, my opponent, strategy, the course)

TRAINING LOG

Record your progress in using the concentration exercise

<table>
<thead>
<tr>
<th>Date</th>
<th>Success in Concentration Exercise</th>
<th>What helped you gain concentration?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Very successful, Some success, Failure</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Very successful, Some success, Failure</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Very successful, Some success, Failure</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Very successful, Some success, Failure</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Very successful, Some success, Failure</td>
<td></td>
</tr>
</tbody>
</table>
Energic Mental Training -- Recognizing energy presence

1. Use centering to relax in a quiet place.
2. In centering, your attention focuses on a location about the midpoint of your body, as you do centered (stomach) breathing.
3. Using the scale from -10 to +10 (extremely tense to extremely relaxed), center until you are about +8 or better.
4. Now, let your body signal the energy that has built through centering.
5. Pay attention to the warmth as blood vessels bring warmth during relaxation--be aware of the mid-body area. (You might experience this building energy instead in other ways, e.g., tingling, a spreading sensation of power, etc.)
6. Now, visualize the scene with the 'winning feeling'.
7. Capture the bodily sensations of the 'winning feeling'.
8. Allow the sensations of the winning feeling that relate to a sense of energy become clear.
9. As these energic sensations become clear, let it grow so that you can identify energy.
10. Next, visualize the scene with the optimal level of activation.
11. Use centering and self-regulation to reach that number that represents your optimal level ("50", "70", "85"?)
12. Allow the body activation related to energy to become clear, as your body is activated--the blood flows, the oxygen flows, the muscles build--picture this process of your body changing--picture the blood, the oxygen, the muscles, the energy.
13. Let the energy sensations become clear, let it grow so that you can identify energy.

With practice, find the best method for identifying energy—centering, use of the 'winning feeling' scene, or body activation.

Know how energy feels to you. Is it warmth growing at mid-body? Is it a spreading sensation? Is it a picture of blood and oxygen and muscle activity? Is it a sensation of deep power?

Energic Mental Training -- Directing energy

All athletes have inner energy; not all athletes guide their energy. Energy that is dispersed reduces your distance, hampers your speed, lowers your endurance, interferes with your power. Energy can be dispersed through stress, tension, concentration lost on the surroundings, or negative thoughts. To prevent this, rely upon your mental skills in stress management, relaxation, concentration, and positive thought control.

Energy can also be harnessed and made directional. Use VMBR for energic directional control:

1. Center and relax in a quiet place.
2. Visualize a competition scene that is successful.
3. Now, while in the scene, pay attention to the direction of your energies--for throwers and fencers, is the force through your arm in front? for spring/hurdlers/long jumpers, swimmers, and skiers, is body energy directed along a lane ahead? for pole vault, high jump, gymnasts, and divers, does the force take your body through a point in space?
4. Repeat the success scene, but imagine an energetic force attached to your body/arm like a ray of light.
5. Continue this scene, visualize the light extending in the proper direction. (For discus, the light explodes out of your hand carrying the discus forward...for hurdlers, the light explodes at the start through your shoulders drawing you to the tape at the finish...for high jump, the light is a tunnel you fit and slide your body through).
6. Repeat visualization until you know your direction, see the light, and feel the light pulling you toward success.
Appendix B (Continued)

Energic Mental Training—Using energy space

Energic space is your sphere of dominance. It is expanding your inner energy to mentally "own" space and competition. It is the mental domination of others in your space, or objects in your space, of anything that threatens your space (even the weather conditions, officiating, etc.).

To expand your energy space:

1. Center and relax in a quiet space.
2. Increase your inner energy—through centering, the winning scene, bodily activation. Notice the energy presence.
3. Use VMBR in the success scene to gather the light and control energetic direction, feeling the pull to success.
4. Now, use VMBR to visualize the coming competition. Picture the space of the competition: the starting blocks, the ring, the lane.
5. Continue VMBR, and picture your inner energy expanding to cover this space.
6. Continue VMBR to increase energy as it covers this space, think about this as "your space".
7. Start to visualize others or objects daring to come into your space; visualize your energy as controlling them, diminishing them.
Appendix B (Continued)

PSYCHOLOGICAL PROGRAMMING FOR PEAK PERFORMANCE

Now that you've completed the mental skills training, you should be a more complete competitor. You should have control over--

- Relaxation
- Stress Management
- Concentration
- Positive Thought Control
- Self-Regulation
- Visual-Motor Behavior Rehearsal
- Energetic Control

By using the self-assessment and training logs, you should now also know what your ideal preparation should be psychologically.

--How can you trigger relaxation: centered breathing? key words? imagery?
--When are you most stressed during competition? What are your body "stress signals"?
--What influences your concentration?
--What negative thoughts are likely to occur during the competition?
--What positive actions help your performance? affirmations? the "winning feeling"? music/people/topics, goals?
--What is your "optimal body activation" level?
--What visualization helps you to peak performance?
--How does energetic mental control help your peak performance?

The final step is to put all of this into a psychological program plan to follow on competition day. The following checklist might be a useful guide:

**DAY BEFORE:**

- ___ familiarize yourself with the field/gym
- ___ become psychologically comfortable on-site

**AFTERNOON BEFORE:**

- ___ use VMBR to rehearse the entire competition

**EVENING BEFORE:**

- ___ use one VMBR success scene only
- ___ use centering and relaxation to sleep
Appendix B (Continued)

COMPETITION DAY:

Start day

- with winning feeling exercise
- list VMBR goals, e.g., explosive start, confidence, how to handle strategy, "Keys"
- employ brief VMBR
- end with success scene

Throughout day

- check for "stress signals"
- use stress management

On field/gym before event

- check body arousal level, use appropriate exercise

During or after warm-up

- use concentration exercise
- then centering and relaxing

Immediately before

- VMBR for single goal, e.g., start, strengthen key, single strategy
- trigger "winning feeling" and energy
- clear your mind, now just let your body take over
SELF-ASSESSMENT

Recognizing energy presence

Examine your sport. At what point is energy important? (To power explosive starts? For the final sprint? After several bouts? At take-off?)

Directing energy

If you tie a line (or light ray) to you, what part of your body would it be tied to and where would the line end? (Would it be to your finger tips or palms, with the line upward and ahead? Would it be to your shoulders, with the line going to the tape at the finish?)

Energy space control

Think about your 'winning feeling'; write down how you felt regarding the presence of other competitors, field conditions, or your javelin (shot, discus, weights). Did you sense you were the best person on the field, did you feel powerful over your javelin (shot, etc.)? Or, consider a poor performance in the same way. Did you feel inferior to someone else, an intruder, controlled by field conditions or the weather?

TRAINING LOG

Recognizing energy presence

List what part of the exercise most increased energetic presence
Appendix B (Continued)

Directing energy

Rate the influence of the energy during light ray visualizing

no help                     extremely helpful
to competition

Energy space control

Rate your ability to dominate through expanding inner space during VMBR

no domination                 I was very dominating
achieved
Appendix B (Continued)

READING LIST*

Kraus, D. PEAK PERFORMANCE. Prentice Hall, 1980


Winter, L. RELAX AND WIN. Barnes, 1981.

*Several books are available, written from many different perspectives. This is not meant to be a complete list, but does highlight some recent books for the athlete.
Appendix B (Continued)

EVALUATION FORM

Please take a moment to give your evaluation of this manual. Send this page to Richard H. Suinn, Professor and Head, Department of Psychology, Colorado State University, Fort Collins, CO, 80523. You may put your name or send it anonymously, but please indicate your sport and event.

Your name ________________________________
Address ____________________________________
Sport ____________________________ Event __________
Athletic skill level (e.g., world class, "A Team", university, varsity, developmental, etc.) __________________________

Step 1: Relaxation Training
Very useful to me ____________________________ Not useful at all

Step 2: Stress Management
Very useful to me ____________________________ Not useful at all

Step 3: Positive Thought Control
Very useful to me ____________________________ Not useful at all

Step 4: Self-Regulation
Very useful to me ____________________________ Not useful at all

Step 5: Mental Rehearsal (VMBR)
Very useful to me ____________________________ Not useful at all

Step 6: Concentration
Very useful to me ____________________________ Not useful at all

Step 7: Energic Control
Very useful to me ____________________________ Not useful at all
Appendix B (Continued)

Programming for Peak Performance (Competition Day)
Very useful ____________________________ Not useful at all

to me _________________________________

Overall Training Manual
Very useful ____________________________ Not useful at all

to me _________________________________

Should this manual be made available to other athletes?
_____Yes   _____No
Appendix C

Skill
front kick
front punch
knife hand
side kick
reverse punch
backfist
overhead block
side twist punch
roundhouse kick
back kick

Combinations
front kick, punch
knife hand strike, side kick
reverse punch, side kick, reverse punch

Muscular endurance
sit-ups
roundhouse kicks on wall

Sparring
Each student will spar the instructor for one minute and will be rated on the following criteria: breathing, speed, power, endurance, flexibility, coordination, relaxation, and execution.

Rating Scale

<table>
<thead>
<tr>
<th>Subject</th>
<th>Skill</th>
<th>Combinations</th>
<th>Sparring</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frm</td>
<td>Int</td>
<td>Pwr</td>
</tr>
</tbody>
</table>

1. 

2. 

3. 

4. 

5. 
Appendix D

Part III: Self-Evaluation Questionnaire

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.

<table>
<thead>
<tr>
<th>Number</th>
<th>Statement</th>
<th>Not at all</th>
<th>Somewhat</th>
<th>Moderately</th>
<th>Very much</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I am concerned about this competition</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>I feel nervous</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>I feel at ease</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>I have self-doubts</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>I feel jittery</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>I feel comfortable</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>I am concerned that I may not do as well in this competition as I could</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>My body feels tense</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>I feel self-confident</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>10</td>
<td>I am concerned about losing</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>I feel tense in my stomach</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>I feel secure</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>I am concerned about choking under pressure</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>My body feels relaxed</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>I'm confident I can meet the challenge</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
Appendix D (Continued)

<p>|</p>
<table>
<thead>
<tr>
<th>Not at all</th>
<th>Sometimes so</th>
<th>Moderately so</th>
<th>Very much</th>
</tr>
</thead>
<tbody>
<tr>
<td>17. My heart is racing</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>18. I'm confident about performing well</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>19. I'm worried about reaching my goal</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>20. I feel mentally relaxed</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>21. I feel my stomach sinking</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>22. I'm concerned that others will be disappointed with my performance</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>23. My hands are clammy</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>24. I'm confident because I mentally picture myself reaching my goal</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>25. I'm concerned I won't be able to concentrate</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>26. My body feels tight</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>27. I'm confident of coming through under pressure</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
Appendix E

SELF-EVALUATION QUESTIONNAIRE

STAI FORM X-1

NAME____________________________________ DATE____________________

DIRECTIONS: A number of statements which people have used to describe themselves 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; that is, at this moment.

There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

Not at all  Somewhat  So so  Moderately  Very much

1. I feel calm . . . . . . . . . . . . . . . . 1  2  3  4
2. I feel secure . . . . . . . . . . . . . . . . 1  2  3  4
3. I am tense . . . . . . . . . . . . . . . . . . 1  2  3  4
4. I feel at ease . . . . . . . . . . . . . . . . 1  2  3  4
5. I feel anxious . . . . . . . . . . . . . . . . 1  2  3  4
6. I feel comfortable . . . . . . . . . . . . . 1  2  3  4
7. I feel nervous . . . . . . . . . . . . . . . . 1  2  3  4
8. I am jittery . . . . . . . . . . . . . . . . . . 1  2  3  4
9. I am relaxed . . . . . . . . . . . . . . . . . . 1  2  3  4
10. I feel over-excited and rattled . . . . . . 1  2  3  4
Appendix F

Part V: General Feelings

DIRECTIONS: Read each item carefully and then answer according to the frequency with which it describes you or your behavior. For example, an item may say "when people talk to me, I find myself distracted by sights and sounds around me." Circle one response that best describes you or your behavior from the following - (A) Never, (B) Rarely, (C) Sometimes, (D) Frequently, or (E) Always. The same key is used for every item, thus each time you mark "A", you are indicating NEVER, etc.

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<table>
<thead>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>When people talk to me, I find myself distracted by my own thoughts and ideas.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>All I need is a little information and I can come up with a large number of ideas.</td>
<td></td>
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<tr>
<td>3.</td>
<td>My thoughts and associations come so rapidly, I can't keep up with them.</td>
<td></td>
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<tr>
<td>4.</td>
<td>I theorize and philosophize.</td>
<td></td>
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<tr>
<td>5.</td>
<td>I get caught up in my thoughts and become oblivious to what is going on around me.</td>
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<td></td>
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<tr>
<td>6.</td>
<td>My interests are broader than most people's.</td>
<td></td>
<td></td>
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<tr>
<td>7.</td>
<td>It is easy for me to focus on a number of things at the same time.</td>
<td></td>
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<tr>
<td>8.</td>
<td>It is easy for me to keep thoughts from interfering with something I am watching or listening to.</td>
<td></td>
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</tbody>
</table>
9. I am good at quickly analyzing complex situations around me, such as how a play is developing in football or which of four or five kids started a fight . . . . . . . . . . . . . . . . . . . A B C D E

10. I have so many things on my mind that I become confused and forgetful . . . . . . . A B C D E

11. In games I make mistakes because I am watching what one person does and forget about the others . . . . . . . A B C D E

12. I can plan several moves ahead in complicated games like bridge and chess . A B C D E

13. On essay tests my answers are (were) too broad, bring in irrelevant information . . . . . . . . . . . . . A B C D E

14. I have a tendency to get involved in a conversation and forget important things like a pot on the stove, or like leaving the motor running on the car . . . . . . . . . . . . . . . . . . . A B C D E

15. It is easy for me to bring together ideas from a number of different areas . . . . . . . . . . . . . . . . . . . A B C D E

16. People have to repeat things because I get distracted by my own irrelevant thoughts . . . . . . . . . . . . . A B C D E

17. People pull the wool over my eyes because I fail to see when they are obviously kidding or by looking at the way they are smiling or listening to their joking tone . . . . . . . . . . . . . A B C D E

Yes ____ No ____ I would like a summary of the results sent to me (probably in May or June)
Appendix G

Part II: Competition Questionnaire

**DIRECTIONS:** Below are some statements about how persons feel when they compete in sports like wrestling. Read each statement and decide if you HARDLY EVER, SOMETIMES, or OFTEN feel this way when you compete in wrestling. If your choice is HARDLY EVER, put an "X" under the column marked "(1) Hardly ever"; if your choice is SOMETIMES, place an "X" under the column marked "(2) Sometimes"; and if your choice is OFTEN, place an "X" under the column marked "(3) Often." 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 wrestling.

<table>
<thead>
<tr>
<th></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></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Before I compete I feel uneasy</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3. Before I compete I worry about not performing well</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. I am a good sportsman when I compete</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. When I compete I worry about making mistakes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Before I compete I am calm</td>
<td></td>
<td></td>
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<tr>
<td>7. Setting a goal is important when competing</td>
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<tr>
<td>8. Before I compete I get a queasy feeling in my stomach</td>
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<tr>
<td>9. Just before competing I notice my heart beats faster than usual</td>
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<td></td>
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<tr>
<td>10. I like to compete in games that demand considerable physical energy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Before I compete I feel relaxed</td>
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</table>
### Appendix G (Continued)

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<tbody>
<tr>
<td>12. Before competing I am nervous . . . . . . . . . . . . . . . .</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Team sports are more exciting than individual sports . . . . . . . . . . . . . . . . .</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>14. I get nervous waiting to start the game or the match . . . . . . . . . . . . . . . . .</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>15. Before I compete I usually get uptight . . . . . . . . . . . . . . . . . . . . . . .</td>
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</table>
Appendix H

Post Experimental Questionnaire

1. How useful do you feel that your cognitive strategy was in aiding your karate performance?

1 2 3 4 5 6 7 8 9 10 11
not useful somewhat useful extremely useful

2. Do you feel that your cognitive strategy would benefit other performers in other sports?

1 2 3 4 5 6 7 8 9 10 11
not at all somewhat very much so

3. Did you receive enough personal attention from the instructor in order to make the technique valuable to you?

1 2 3 4 5 6 7 8 9 10 11

4. Do you feel that your cognitive strategy aided your karate performance?

1 2 3 4 5 6 7 8 9 10 11

5. Did you attempt to practice your cognitive strategy regularly?

1 2 3 4 5 6 7 8 9 10 11

6. Did you understand the procedures for your cognitive strategy?

1 2 3 4 5 6 7 8 9 10 11

7. Do you plan to ever use your cognitive strategy after the completion of the semester?

1 2 3 4 5 6 8 9 10

8. Would you recommend this technique to others?

1 2 3 4 5 8 9 10
Appendix H (Continued)

9. Did you gain any insight into yourself through the use and practice of your cognitive strategy?

10. Would you be interested in learning and practicing another cognitive strategy designed to improve your performance?

1 2 3 4 5 6 7 8 9 10 11
Appendix I

Interview Record and Scoring Sheet

Tom Seabourne

Biographical/Experience Data

Age__________________

Sex__________________

Belt rank______________

Do you have any previous experience in karate? Explain.

Do you have any previous experience in other sports? Explain.

Do you have any previous experience in the practice of mental preparation? (i.e., relaxation, meditation, biofeedback, imagery, psyching-up strategies, etc.) Explain.

Instructions. The following questions deal with various aspects of karate performance and competition. Your honest and accurate responses will help us to understand some of the important factors in optimal karate performance and help us to offer more beneficial services to people like yourself. Your responses will be kept confidential. Thank you for your cooperation.
Appendix I (Continued)

Karate Sparring Performance Questions

How anxious are you before your bout?

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<td>not anxious</td>
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How confident are you before your bout, in general?

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<tr>
<td>not confident</td>
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Are you psychologically in control of the bout, or is your opponent?

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<tbody>
<tr>
<td>I have no control</td>
<td>I am somewhat in control</td>
<td>I am definitely in control</td>
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Is your fighting style aggressive, defensive, counter-attacker, or somewhat in between?

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<td>defensive</td>
<td>counter-attacker</td>
<td>aggressive</td>
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How tough would you describe yourself to be?

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<td>somewhat tough</td>
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How effective is your favorite fighting technique?

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Do you enjoy sparring?

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Appendix I (Continued)

Do you have trouble getting yourself up or energized for performance in karate?

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Do you have trouble concentrating during karate performance?

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Do you think about performing poorly in karate?

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Do you concentrate more on your own karate performance or those in your class?

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When you perform karate techniques, is your concentration "in the moment" or in the future or past?

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<td>in the moment</td>
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Do you worry about making mistakes in a karate performance?

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Do you talk to yourself while performing in karate?

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When you make an error in your performance, do you become anxious?

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Appendix I (Continued)

Do you worry about "choking" prior to your karate performance?

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Appendix I (Continued)

Directions: Please feel free to write your answers to the following questions with as much detail as you like.

1. Do you feel confident that you are mentally and physically preparing yourself as well as possible for your karate performance?

2. How does your body usually feel when you perform well?

3. How does your body usually feel when you perform poorly?

4. Have you ever thought much about the role that your thoughts, emotions, and feelings play in your karate performance?

5. When you have karate performance problems, what do you think is interfering with your ability to perform maximally?

6. Do you really have the physical karate skills down?

7. When you perform real well in karate, do you have any explanation of why? Describe your feelings and thoughts in these situations.

8. How are they different from when you perform poorly?

9. What were you thinking and feeling prior to, during, and after these peak experiences in karate?

10. How does it differ from your thoughts and feelings when you perform poorly?

11. Do you have any idea as to why you perform so well in certain karate situations?

12. What do you think are the differences between problem and peak karate performances?
Appendix J

After establishing rapport and having the athlete feel comfortable, I will ask the subject:

I. Reiterate some of the information he or she had submitted to me in the written needs assessment.
   A. "Describe to me what happened with your thoughts and feelings the last time you performed poorly."
   B. "Try to recall how your body felt."

II. Now compare these to your thoughts and feelings prior to a good performance in karate.
   A. "Do you notice anything here?"
   B. "Do you realize that you can control your thoughts and feelings?"
   C. "Do you realize that your thoughts and feelings may help or hinder your karate performance?"
   D. "Why have you failed to control your thoughts in the past?"
   E. "Are you beginning to realize that your thoughts and feelings are important to your karate performance?"

III. Prior to intervention:
   A. "This part of the interview was an important first step in helping yourself."
   B. "Are you ready to learn a technique to improve your karate performance?"
   C. "What do you think might be used out of 'The Seven Steps To Peak Performance' to help you?"
   D. "Is there anything else I should know about you before we learn the cognitive strategies? I feel that we may really make some progress. Your openness and honesty are very important; it will help you know yourself better, and it will help me help you help yourself better."
Appendix K

Weakness prevails over strength gentleness conquers, the calm and restful breeze tames the violent sea.

Do not seek victory in contention, for where there is no contention there is neither victory nor defeat, the supple willow does not contend against the storm yet it survives.

Revenge is a water vessel with a hole, it hold nothing but the promise of emptiness.

Fear is the enemy, trust is the warrior. Listen for the color of the sky, look for the sound of a hummingbird's wings, search the air for the perfume of ice on a hot day. When you have found these things, you will know.

The cobra seeks to fix the eye of the bird, in that moment of looking at each other each accepts his role the predator and prey. The victim creates his own destiny.

In class, you will be required to sit with your eyes closed and go over these quotes in your head, one by one, thus, try to memorize them.
Appendix L

Cognitive Strategy Exam

What is the name of your cognitive strategy?

Briefly outline the steps of your cognitive strategy.

When you practice your technique, describe your arousal (anxiety) level.

1  2  3  4  5  6  7  8  9  10  11
calm       somewhat        anxious

What do you do if your mind wanders while you are practicing your technique?

1  2  3  4  5  6  7  8  9  10  11
try            let it        give up
harder       come

How many times per week do you practice your technique?

1  2  3  4  5  6  7  8  9  10  11
once a week               more than 4 days/wk
                                 every day

Do you feel comfortable (familiar) with your technique?

1  2  3  4  5  6  7  8  9  10  11
uncomfortable            somewhat        very
                                 comfortable

Did you understand the instructor's explanation and comments concerning your strategy?

1  2  3  4  5  6  7  8  9  10  11
not at all                somewhat        very much so
                                 so

How many minutes per day do you practice your technique?

1  2  3  4  5  6  7  8  9  10  11
1 min.     more than 4 days/wk    ten
or less                       5 min.
Appendix L (Continued)

Do you feel that this technique is aiding your karate performance?

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<tr>
<td>not at all</td>
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<td>helpful</td>
<td>helping</td>
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Do you plan to continue to use some form of this technique after the semester is over?

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<td>not at all</td>
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<td>yes, very</td>
<td>much</td>
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Were you able to incorporate these strategies into your lifestyle?

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