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COGNITIVE AFFECTIVE STRESS MANAGEMENT TRAINING WITH HIGH PERFORMANCE YOUTH VOLLEYBALL PLAYERS: EFFECTS ON AFFECT, COGNITION, AND PERFORMANCE

by

PETER RONALD EARL CROCKER

A THESIS

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DEDICATION

TO MY PARENTS ....

ELLARD AND DOROTHY CROCKER

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Abstract

Contrary to previous research into Cognitive-affective/Stress Management Training, the purpose of the present study was to investigate SMT in a quasi-experimental controlled study with high performance youth athletes. The study sample consisted of the 1987 Alberta Canada games men and women's (under 19) volleyball teams, separated into control and treatment groups, within each team, on the basis of geographical location. The treatment group was administered an eight week package consisting of one hour modules. All subjects were evaluated on affective, cognitive and performance measures at pretreatment and posttreatment, while the treatment players were also evaluated at six month posttreatment. Further data was collected three weeks posttreatment at the National Challenge Cup.

The analysis at posttreatment found that the treatment subjects had fewer negative thoughts to video-taped volleyball stressors and superior performance compared to the control group. The positive thoughts were in the expected direction. The anxiety measures, however, did not reveal any trends in the direction of the hypothesized results. Follow-up analysis revealed some gender differences with the women's team exhibiting more durable treatment effects, although this data is confounded with time. The Challenge Cup analysis revealed some results that were contrary to the expected treatment effects. The male control group had lower cognitive anxiety while the control females had lower somatic anxiety in some games compared to the treatment groups. These data may be reflective of construct validity problems. The performance data was not interpretable. A program evaluation questionnaire indicated that players found the SMT program moderately effective in understanding and controlling negative stress. Based on the converging results, it was concluded, with some caution, that SMT is an effective stress management program with high performance youth volleyball players. Nevertheless, additional research is critically

needed to unravel the complexities behind appraisal processes, coping, and stress relationships so that efficient and effective intervention programs can be designed to help athletes and coaches gain emotional control.

Table of Contents

List of Tables

List of Figures

CHAPTER 1

Introduction

Organized sport competition is capable of eliciting high levels of distress (Long, 1980; Scanlan, 1984; Smith, 1980; Smoll, 1986). The inability of athletes and coaches to self-regulate emotional behavior and experience often leads to adverse consequences such as sport violence (Goldstein, 1983). In the 1987 World Junior Hockey Championships, Canada was involved in two bench clearing brawls against first the U.S.A. and then against the Soviet Union. This latter incident led to the disqualification of both Canada and the Soviet Union and triggered several weeks of national debate about the future direction of Canada's "unofficial" national sport.

The disruptive qualities of stress, however, are often far more subtle than the sport violence seemingly adored by the media. Stress often leads to reduced enjoyment (Scanlan & Passer, 1978), disrupted performance (Suinn, 1976; Kroll, 1982), increased risk of athletic injury (Cryan & Alles, 1983), and lack of participation (Orlick & Botterill, 1975; Orlick, 1986). The presence of competitive stress spans all ages and ability levels. Scanlan and her associates (e.g., Scanlan & Lewthwaite, 1984, 1986; Scanlan & Passer, 1978) have identified numerous factors that contribute to competitive stress in youth sport. Other researchers have reported interviews with elite athletes that implicate stress in performance disruption (Kroll, 1982; Orlick, 1985; Smith, 1980; Suinn, 1976). For example, Smith (1980) reported that over 40% of 200 football players indicated that they experience high levels of stress that they believed interfered with their performance.

Many emotional control problems probably occur because the individuals involved do not possess, or possess and do not use, the required coping skills (Meichenbaum, 1985; Roskies & Lazarus, 1980). One could easily speculate that many athletes fail to reach levels of achievement within their level of physical and mental ability because they lack

the coping skills required for successful performance. Despite the experimental and experiential evidence linking the inability to manage and control high stress levels to performance disruption, coping skills training in competitive sport is very sparse (Long, 1980). Most coaches, even at the elite level, are not certain which coping skills techniques are more effective or suitable for the athlete or how to implement such a program (Feltz & Landers, 1981).

There are several different conceptual models for stress reduction including extinction and counter conditioning, cognitive mediational, and coping skills models (Smith, 1984). In recent years, sport psychologists have attempted to adapt stress management programs that were originally developed for "clinical populations". These programs were developed to treat clinical symptoms such as maladaptive anger (Novaco, 1975, 1977), phobias (Meichenbaum & Cameron, 1972), and excessive anxiety (Goldfried, 1971; Suinn & Richardson, 1971). Two coping skills programs that have shown some promise in helping athletes gain emotional control and possibly enhance performance are stress inoculation training (Meichenbaum, 1977, 1985) and cognitive-affective stress management training (Smith, 1980). Stress inoculation training, or SIT for short, is designed to teach a comprehensive and flexible set of active coping behaviors that can be utilized in a number of stress-related situations. The effectiveness of SIT in controlling stress has been explored in sporting situations including SCUBA (Diekis, 1983), abseiling (Mace & Carroll, 1985,1986), and cross-country runners (Ziegler, Klinzing, & Williamson, 1982).

Cognitive-affective stress management training, or SMT program was designed specifically to teach the athlete a specific "intergrated coping response" having both relaxation and cognitive components which can be used to control emotional arousal (Smith & Smoll, 1982). Despite the fact that the SMT program was first published in two separate

book chapters in 1980 (Smith, 1980a, 1980b), there are few controlled investigations into its effectiveness. Most of the evidence reported by Smith and his associates consists primarily of case studies or group studies that lack control conditions. SMT has been applied to such diverse groups as football players (Smith & Smoll, 1978), figure skaters (Smith, 1980), test anxious students (Nye, 1979), and cross-country runners (Ziegler et al., 1982). The lack of controlled outcome studies makes it difficult to evaluate the effectiveness of SMT.

One practical advantage of the cognitive-affective program is that is highly structured and directed towards having the athlete learn a specific coping response. This makes it easier to evaluate the effectiveness of SMT compared to a highly flexible and less structured program like stress inoculation training. On the other hand, the lack of SMT's flexibility may not meet the needs of individual athletes and therefore may not be effective for some athletes.

Cognitive-affective Stress Management Training represents a complex intervention package which, like any package, is difficult to evaluate in terms of effectiveness because of the problems of internal validity, construct validity, and external validity (Campbell, 1987). In general, The SMT framework appears to be sound in that its theoretical tenets are based on cognitive emotion theories (Lazarus, 1966; Schachter, 1977). The coping skills intervention used in SMT also receives construct validity from theoretical development in the stress, appraisal and coping area (Lazarus & Folkman, 1984; Pearlin & Schooler, 1978). The application procedures have received converging empirical evidence in reducing stress such as relaxation (Novacco, 1977), self-instructional training (Mace and Carroll, 1985; Meichenbaum, 1985), and induced affect (Siprelle, 1967). Furthermore, SMT employs a cognitive-behavioral approach which has been advocated to be effective in a number of behavioral intervention areas (Mahoney, 1979; Meichenbaum, 1977). Nevertheless,

cognitive-affective stress management training needs to be evaluated under controlled outcome conditions to internally validate its effectiveness.

Proposed Research

The purpose of this study is to investigate the effectiveness of SMT in reducing the adverse effects of competitive stress at the youth high performance level. The team selected as a target sample is the Province of Alberta juvenile (18 & under) women's and men's 1987 Canada Games volleyball teams. These high performance youth teams were selected because:

1. High performance youth players are subjected to potentially high stress situations in training and at the National Championships.
2. They are involved in a highly structured training program.
3. They are a non-clinical population.
4. Youth players often lack the experience of high level competition in which they might learn effective coping skills.
5. Youth players receive little, if any, formalized stress management training.
6. There is an increasing trend in applying cognitive behavioral modifications techniques to sport populations (Mahoney, 1979; Gravel, Lemieux, & Ladoucer, 1980; Hamilton & Fremouw, 1985).
7. Volleyball performance can be broken down into measurable components (e.g., service reception, blocking, serving, and spiking).

The specific treatment program was carried out over a three month period (8 training sessions) with assessment occuring at pretreatment, posttreatment, and a six month follow-up. Additional assessment occured about two-three weeks posttreatment at the

National Challenge Cup held in Regina, Sasketchewan. In line with Meichenbaum's (1977) recommendation that affective, cognitive, and behavioral measures be evaluated in assessing any treatment program, the specific purposes of the study were:

1. To examine the effects of SMT on affective measures of the stress response, namely state anxiety and trait anxiety.
2. To examine the effect of SMT on changes in general self-efficacy.
3. To examine the effects of SMT on mediating thoughts to potentially stressful situations.
4. To examine the effects of SMT on game and controlled practice performance.
5. To determine whether state or trait anxiety are significant predictors of controlled and/or game performance.
6. To determine whether competitive trait anxiety is a significant predictor of pregame state anxiety.
7. To examine how players perceived the effectiveness of each component of the SMT program.

CHAPTER 2

Review of the Literature

This study is primarily concerned with evaluating the efficacy of Cognitive-affective Stress Management Training Smith (1980a) in a controlled study employing high performance youth volleyball players as subjects. Studies designed to test the separate components of the treatment will be left to future study and/or other researchers. The conceptualization behind the development and proposed effectiveness of stress management training is reflected in the review of the literature. The review of the literature is divided into six main areas: cognitive theories of emotion, conceptualizations of stress, effects of stress/emotion on action, sport and anxiety, conceptual approaches to stress management, and a review of cognitive affective stress management training.

A) Cognitive theories of emotion

Human emotions have a profound impact on the life of each individual. Emotions have been the source of speculation for poets, painters, composers, as well as psychologists (Mandler, 1985). Emotion constitutes an important aspect of involvement in sport (Vallerand, 1983). Terry Simpson, coach of Canada's 1985 National Junior Hockey Team, stressed the importance of playing with "controlled emotion". Ryan (1986) argued that volleyball setters must be able to calmly communicate the offense to teammates with consistent emotional control. Most players, coaches, administrators, and fans all seem to understand how emotions are felt or displayed, but there is little agreement among theorists regarding a simple explanation of what emotion is (Vallerand, 1983). A major handicap in the study of emotion is arriving at an acceptable definition. This problem originates from the historical context from which the different theoretical approaches developed (i.e., physiological vs psychodynamic vs behavioural vs cognitive). For

example, William James (1890), reflecting his training in biology and medicine, developed a concept of emotion which emphasized the relationship between subjective feelings and physiological states. James assumed that feedback from the autonomic nervous system was the key factor in determining emotional feelings. More contemporary theories, such as an attributional analysis proposed by Weiner (1982, 1985), place far more emphasis on cognitive processes in determining the emotional life of the individual. According to Weiner, cognitions (attributions) about obtained outcomes contribute to the emotions.

Many other models or theories of emotion vary in the relative importance of either physiological changes or cognitive influences in determining emotional behaviour and experience. These disagreements among theorists results in a rather confusing state of understanding in the psychology of emotion.

Although it may be difficult to find a definition of emotion that is acceptable to all theorists, it is possible to describe the major components which have been the source of investigations into emotion (Vallerand, 1983). There are three major components that need to be considered in emotion. The first component is the conscious or subjective component which is concerned with what is experienced by the person. The conscious component has been investigated by those psychologists who believe that cognitions are the major factor in determining emotion (e.g., Lazarus and Folkman, 1984; Weiner, 1982).

The second component is concerned with observable, measurable behaviour such as grinding teeth, facial expression, or other physical gestures. This dimension of emotion is the domain of the behaviorists (e.g., Millenson, 1967), although some cognitively oriented researchers (e.g., Schachter, 1964) also rely upon the behavioural component. Indeed, cognitive behavioral approaches assume that both thoughts and actions interact and influence each other and the environment in a transactional fashion (Meichenbaum, 1985; Smith, 1986a). In sport situations, measurable behaviors may include performance

analysis or other behaviors such as number of fights, penalities, shots, or interactions.

The third and final component of emotion is that of physiological changes. These changes in the autonomic nervous system include heart rate, blood pressure, viseral functioning, and galvanic skin response. Although this component of emotion was of primary interest to the psychophysiologists (e.g., Duffy, 1941), it is now more prominant among what are often called cognition-arousal theorists (e.g., Lazarus, 1966; Mandler, 1985: Schachter, 1964). These two-factor theories propose that emotional experience results from an constant interaction between cognitive evaluation and arousal. The two-factor approach contrasts with a "pure" arousal perspective such as advocated by Duffy (1941). She hypothesized that changes in emotion simply reflected changes in energy levels.

The three components of emotion reviewed above; conscious experience, physiological changes, and observable physical behaviour, may be important factors to consider in the understanding and evaluation of emotion. These three components can be found, to a greater or lesser degree of emphasis, in most models and theories of emotion. It would be an enormous task to review all of the emotion theories that exist in the literature. There are numerous excellent books which serve that purpose (see Young, 1973; Strongman, 1978). Instead I will review some of the contemporary theories of emotion that emphasize the role of cognitive processes which serve as a conceptual base for coping skills stress management programs such as stress inoculation training (Meichenbaum, 1977, 1985) and cognitive-affective stress mangement training (Smith, 1980a). These theories have become very popular and have spawned a renewed interest in the study of emotion (Vallerand, 1983, 1987). These theories and models of emotion include the writings of Arnold (1960), Lazarus (1966,1977), and Weiner (1971, 1985).

M. Arnold

Arnold (1945, 1969, 1970) proposed a theory of emotion which has developed over three decades and appears as a mixture of phenomenology, physiology and cognition (Strongman, 1978). Arnold proposed that cognitive appraisals represented the critical determinant of emotion. She suggested that we immediately and automatically evaluate, according to our well- being "here and now", any situation that we encounter. Cognitive appraisals may be of two types. The first type of appraisal is intuitive and almost automatic. The second type is reflective or rational. Arnold contended that intuitive appraisal is very important and is implicated in all emotions. On the other hand, reflective (attributional) appraisal is secondary and only takes place after intuitive appraisal.

Arnold argued that appraisal produces a "felt tendancy" towards or away from a situation and produces specific physiological changes. This leads the individual to approach any situation that is appraised as "good", to avoid situations evaluated as "bad", and ignore "indifferent" situations. This tendency to do something may vary in intensity. When this tendency is strong it is called emotion, although all appraisals have the status of affective experiences (Strongman, 1978).

The felt tendency produced by cognitive appraisal provides an impetus to action. There is, however, one final link in the appraisal chain before we act. The present situation plus relevant memories leads to inferences about future events. These memories plus expectations cause the individual to devise a plan of action which involves possibilities for coping with the situation (Strongman, 1978). Therefore, the action defined by the initial intuitive appraisal is not final. For instance, the hockey player may have a strong desire to retaliate after being hit with a hard body-check. Yet he knows that the consequences of such an illegal action may hurt his team. Therefore, deliberate judgements counterbalance or override or, in some cases, reinforce intuitive

appraisal (Arnold, 1970). On the other hand, deliberate judgements may be disrupted because intuitive appraisal directs attention to some event which is emotionally more appealing. A volleyball player involved in a difficult, physically and mentally demanding practice may have her attention diverted away by the sight of an attractive male on the sidelines. As a result, deliberate judgement may lose out because the emotion interferes with the execution of a plan of action (Arnold, 1970).

R.S. Lazarus

Richard Lazarus and his associates (Lazarus, 1966; Lazarus & Folkman, 1984; Lazarus and Launier, 1978) have been highly influencial in promoting the importance of cognition in emotion experiences and behavior. The key feature of Lazarus's formulation is that individuals are evaluators. People evaluate each situation with a view to its personal relevance and significance. Each evaluation, or cognitive appraisal is specific to each emotion and serves as an adapting function in that cognitive processes arouses coping processes to deal with an appraised situation (Vallerand, 1983).

Lazarus (1966) suggested there are two broad types of appraisal which restructure the environmental information into functional stumuli. These two types of appraisal are benign appraisal and threat appraisal. Benign appraisal has three possible adaptive consequences. First, there is automatic coping which is dealing with situations without producing emotion. These particular coping responses occur often without conscious awareness. The second outcome of benign appraisal is reappraisal. Reappraisal results in the restructuring of the environmental stimuli and makes a potentially threatening or unpleasant stimuli more positive (Mandler, 1985). The third adaptive function of benign appraisal may occur when positive emotional states form from benign appraisal.

In recent writings (Lazarus & Folkman, 1984), Lazarus has focused more extensively on the second broad category of appraisal termed threatening appraisal which involves two processes. The primary process deals with the evaluation of the threat or nonthreat. The secondary process deals with the actual coping process in response to the perceived threat. The secondary process involves both problem-focused coping and emotion-focused coping responses which attempt to change or redefine the perceived threat. Lazarus and Folkman (1984) emphasized that primary and secondary processes are dynamic and interactive.

Lazarus suggested that emotion is a complex system that occurs as a result of a transaction between three subsystems; stimulus properties, emotional responses (cognitive, expressive, and behavioural) and the appraisal process. He argued that one cannot attempt to understand emotion by analyzing each system separately. It is the cognitive appraisal of the environment and one's ability to manage these demands that produces the emotional response.

An example from a sporting situation may help clarify the basic tenets of Lazarus's theory. Take the soccer player attempting to dribble by a known aggressive opponent. The attacking player appraises whether or not the opponent (stimulus) is threatening (physically and ego-wise). Once the defender is appraised as a threat, coping mechanisms would be triggered through secondary appraisal to deal with the threat. The emotional responses such as feelings of apprehension and fear (cognitive), increases in sweating and heart rate (expressive), and passing the ball instead of dribbling (instrumental) would follow. The player's actions would then provide feedback to the appraisal system resulting in an "update" and a change in cognitive appraisal and emotional experience.

Lazarus's theory is quite complex and represents a cognitive adaptive argument for emotion. It has, like most theories, been the focus of some criticism. For example, it is not

clear how primary and secondary appraisal interact (Arnold, 1968) or how threatening a stimulus must be judged in order to trigger the secondary appraisal mechanism (Vallerand, 1983). Nevertheless, Lazarus's model has served as the conceptual basis of Smith's (1980) stress management training program for athletes. Lazarus's conceptual viewpoint of appraisal and coping processes in the stress reaction will be discussed in greater detail in a later section.

B. Weiner

Weiner and his associates (Weiner, 1971; Weiner, 1985; Weiner, Russell, & Lerman, 1979) proposed a dynamic expectancy-value theory of motivation in which expectancy and emotion direct motivated behavior. Weiner argued that cognitive evaluations or causal attributions made after an outcome determines not only the emotional experience but also one's choice of activities, performance levels, and expectencies for future performance (Roberts, 1980). Thus, cognitions determine emotion and act as a directing, motivating force (Weiner, 1985).

Weiner (1971) originally suggested that attributions for outcomes emerge primarily from four causal sources: ability, effort, task difficulty, and luck (Rejeski, 1980). These four causal elements were originally placed in a two dimensional model. The first dimension was termed locus of control, a measure initially conceptualized by Rotter (1966). Ability and effort are generally considered to be under the personal control of the individual. On the other hand, luck and task difficulty are considered external forces and are considered to be outside personal control.

The second dimension was termed stability and refers to whether the causal explanation is fixed or variable. The elements of luck and effort can fluctuate over time, while ability and task difficulty are thought to be relatively stable. Rejeski (1980) has

suggested, however, that in sporting situations that ability, especially physiological parameters such as fitness, may be considered at times to be an unstable factor. Furthermore, ability is unstable early in the learning process.

A third dimension of causality, termed controllability, was later proposed when it became evident that some causes identically classfied on both locus of control and stability factors yielded dissimilar results (Weiner, 1982). The concept of controllability suggests the person 'could have done otherwise'. For example, a person cannot control such factors as inherited characteristics or, in most cases, illness. On the other hand, effort is subject to personal control. Using the three dimensions of causality, effort is internal, unstable, and controllable, whereas motor coordination is internal, stable, and uncontrollable (Weiner, 1985).

Weiner (1985) proposed that emotion is determined by a two stage process in which cognitions of increasing complexities differeniate emotional experience. Following an event or outcome, a primitive emotion of a general positive or negative nature is produced based upon perceived failure or success. These outcome-dependent, attribution-independent emotions are determined by goal attainment. Success usually produces happiness while frustration and sadness follow failure.

The second stage of the emotional experience occurs when the person attempts to determine the cause of the outcome. The chosen attribution generates a different set of emotions, which are labeled attribution-dependent emotions. This second stage of attribution generation has been the focus of extensive work in the sport psychology literature (see Brawley & Rejeski, 1983; Septon and Wankel, 1987).

The specific emotional reactions to the causal attribution is determined by the three dimensions of locus, stability, and controllability, plus who the recipient of the outcome is (Fiske & Taylor, 1984; Weiner, 1985). The emotions of pride and positive self-esteem

are related to the dimension of internal locus. These affective states are associated with positive outcomes ascribed to self-related actions. Guilt may follow negative outcomes to which the individual abscribes personal responsibility to controllable causes such as effort. Anger, on the other hand, follows a negative self-related outcome attributed to factors controllable by others.

The dimension of stability seems to affect the intensity of emotions. If a person perceives a cause as stable, then the resulting emotion will be more pronounced than if the perceived cause is unstable (Weiner, 1979). For example, positive affect is maximized when the individual perceives a successful outcome is due to the stable internal factor of ability (Rejeski, 1978). However, when success is attributed to external and unstable factors such as luck, then pride is reduced (Rejeski, 1980). This intensifying effect for the stability dimension holds true also for negative affects. Hopelessness results from abscribing negative outcomes to stable causes such as lack of ability.

Weiner's model seems to have important implications for controlling negative emotions following failure. Attributing failure to unstable, external elements (i.e., luck) should produce less intense negative affects compared to when failure is attributed to stable, internal factors (i.e., ability). Rejeski (1980) has noted, however, that fostering external attributes may produce undesirable effects. Athletes who attempt to succeed but fail, and attribute this failure outcome to external factors, experience a form of learned helplessness (Dweck, 1976; Seligman, 1975). These individuals perceive that task outcomes are uncontrollable, lose interest and motivation in the sport, and often drop out (Roberts, 1977).

Weiner's model has been very popular and widely supported in a number of different areas of study (Fiske & Taylor, 1984). That success has not prevented criticism, however. One of the main criticisms concerns whether the model is one of emotion or a model of

thoughts of emotion (Vallerand, 1983). Much of the original research was restricted to situations wherein the individual had almost unrestricted time to make causal attributions. These studies often used role playing or scenerio methodologies. Therefore, subjects in these experiments may have responded on how they thought they should feel (Fiske & Taylor, 1984).

Another possible criticism is that Weiner seems to selectively ignore the role of physiological arousal in emotion. According to Weiner, the subjective experience of emotion completely depends on the meaning attached to a situation. Weiner's position contrasts with those of Mandler, Schachter, and Lazarus who all posit that arousal interacts in some way with cognitions to produce emotional experience. Weiner (1982) defended his position on the basis that arousal is completely superfluous to the attributional analysis. He argued that cognitions are a sufficient determinant of affect.

B) Stress

Due to the different orientation of researchers, there is a lack of agreement on a definition of "stress". Mason (1975) summed up this dilemna when he stated,

> The disenchentment felt by many scientists with the stress field is certainly understandable when one views two decades in which the term "stress" has been used variously to refer to "stimulus" by some workers, "response" by some workers, "interaction" by others and more comprehensive combinations of the above factors by still other workers (p. 29).

Attempting to support any one orientation of stress is wrought with pitfalls. For example, response-based definitions of stress (e.g., measuring changes in autonomic nervous system activity) suffers from the fact the same general physiological response (e.g., Heart rate) may occur because of completely different environmental conditions (Hamberger and Lohr, 1984). Lazarus and Folkman (1984) and others have strongly argued that the psychological interpretation of an environmental conditions will be different

between individuals and time. Because of these difficuties in defining stress, Lazarus suggested that stress be used as a collective term for an area of study.

There has been a growing shift towards viewing stress in subjective or phenomenological terms (McGrath, 1970; Lazarus & Folkman, 1984; Diekis, 1983). Stress is increasingly viewed as a dynamic interaction between the environment and an individual. The nature of the stress response is increasingly thought to be dependent on the perceptual-cognitive abilities of the individuals.

More than anyone, Lazarus and his colleagues (e.g., Lazarus, 1966, 1977; Lazarus & Folkman, 1984; Lazarus & Launier, 1978) have attempted to develop a comprehensive cognitive account of stress. In their cognitive phenomenological analysis of psychological stress, Lazarus & Launier (1978) argued that three key stress relationships (harm-loss, threat, and challenge) occur between the person and environment. They suggested that these stress relationships can not be understood as either person or environment variables, but must be approached from a transaction perspective.

Lazarus argued that linear casual models or static statistical concepts of interaction cannot handle the continuous flow of person-environment relationships in stress and coping (Lazarus & Launier, 1978). The higher order concept of threat can only be understood by examining the transaction between the environmental demands and the resources of the person. A person may perceive a situation as threatening because the environmental demands are excessively taxing for the person's resources. Conversely, the environmental demands may be relativey low but still exceed the individual's perceived resources for managing it (Lazarus & Launier, 1978).

From the transactional perspective, it is senseless to attempt to partition out discrete "elements" of stress. The transactional approach implies there is a "reciprocity of causation".

> The person thinks and acts and thereby changes the person- environment relationship; information about this is fed back to the person through cognitive activity. Moreover, the environment often actively resists our effort to cope by changing it (Lazarus & Launier, 1978, p. 291.).

Lazarus (1977) suggested that psychological stress requires a judgement that the person-environment transaction involves one of the three stress relationships (harm-loss, threat, challenge). This process is dependent upon the cognitive appraisal of the environmental demand and one's ability to manage these demands (coping ability). The coping processes may be a series of physical and/or cognitive responses that function to actively change or reappraise the situation. If the environment demands exceed the individual's coping ability, the individual is overwhelmed. Its seriousness is primarily determined by the costs/benefit of the situation. For example, a deep personal commitment to success, which is common in elite athletes, would probably leave an individual more vulnerable to threat by the prospect of poor performance, injury, and being left out from the team compared to an individual with a lower commitment (Lazarus & Launier, 1978).

Many recent writings on competitive stress in athletic settings are based on Lazarus's transactional perspective. For instance, Smith's (1980) cognitive-affective stress management program views the stress response as a transaction between environment, cognitive appraisal, physiological arousal, response, and personality and motivational factors. Long (1980) suggested that effective coping skills to manage environmental demands are required in athletic competitions to prevent performance disruption, enjoyment reduction, and even injury. Scanlan (1984) argued that a young athlete experiences a negative emotional reaction when he/she perceives an imbalance between competitive performances demands and his/her ability to meet those demands. All three of these writers imply a transactional perspective in the stress process.

C. Stress, Anxiety and Performance

Stress is an integral part of sport (Long, 1980). Many different emotions may be elicited in the sport setting, including jealousy, anger, shame, guilt, joy, happiness, contentment, and anxiety. The construct of anxiety is probably the most studied subjective experience in performance situations (e.g., Deffenbacher, 1978; Gould, Petlichkoff, Simons, and Vevera, 1985; Hodges, 1968; Martens, 1977; Passer, 1983; Scanlan, 1984). The important role of anxiety in sport competition is recognized in a definition of competitive stress;

> ...the acute state anxiety reaction to competitive situations that the participant perceives as threatening to self- esteem (Scanlan & Lewthwaite, 1984, p. 209).

Competitive stress occurs when the athlete perceives a discrepency between his/her ability to successfully meet the demands of the competitive situation and therefore anticipates negative outcomes (Scanlan & Passer, 1983; Scanlan, 1984).

Speilberger (1972) defined the anxiety state as "unpleasant, consciously perceived feeling of tension and apprehension, with associated activation or arousal of the autonomic nervous system" (p.29). It has been recognized, however, that anxiety can be separated into two independent but interacting factors. Trait anxiety is described as relatively stable individual differences in anxiety proneness (Speilberger, Gorsuch, and Lushene, 1970). State anxiety, on the other hand, is characterized by a temporary state of unpleasant, consciously perceived feelings of tension, worry or concern.

A strong prediction that follows from Spielberger's state/trait anxiety conceptualization is that there should be only small performance differences between high and low trait anxious persons under nonstressful conditions. However, these performance differences should become more emphasized as the level of stress increases.

This prediction has generally been reported for ego-related threat (fear of failure) but not for physical changes (Hodges, 1968; cf: Eyzenck, 1982).

A central question is how does anxiety disrupt performance? A popular position is that worry and other cognitive irrelevant activities are the crucial determinants of performance disruption (Morris, Brown, and Halbert, 1977; Wine, 1971). Sarason (1975) suggested that the highly anxious person is distracted by task irrelevant self-defeating thoughts. Task-irrelevant thoughts disrupt performance because they compete with task-relevant information for space in the processing system (Eysenck, 1982).

The disruption of task performance by task-irrelevant thoughts is predicted by models of attention. Early models of attention (e.g., Broadbent, 1958; Welford, 1952; Keele, 1973), while differing in detail, shared many common features in regards to explaining performance decrements (Schmidt, 1982). Attention was thought to be a fixed, undifferential capacity for processing information. When the task demands exceeded capacity, performance decrements occured.

Some attentional models proposed in the 1970's (e.g. Kahneman, 1973; Posner & Snyder, 1975) suggested that attention capacity was more flexible. Posner and Snyder developed a conceptual distinction between conscious and automatic attention. Automatic attention should not interfere with any ongoing activity. Conscious attention was slower and more errorful but could be used in a flexible fashion at different stages of processing (Eysenck, 1982). Kahneman argued that attentional capacity was flexible, changing as the task requirements change. As a task becomes more difficult, more capacity becomes available for processing. Performance is disrupted when attentional capacity is exceeded.

Recent theories (e.g., Freidman & Polson, 1981; Navon & Gopher, 1979; Wickens, 1980) have conceptualized attention not as a single and differentiated capacity, but as a number of pools of processing resources. These multiple-resources theories posit that

each pool has its own capacity and is designed to handle specific classes of processing or tasks (Schmidt, 1982). For example, Freidman and Polson suggested that the left and right hemispheres have separate limited capacity pools of undifferentiated resources. According to Navon & Gopher (1979),

> not only can the processing system as a whole be involved in several activities in variable proportions but a specific mechanism or modality is not necessarily dominated by one process exclusively but instead can accommodate more than one process at the expense or speed of performance (p. 233).

The cognitive attention model has been only one of the explanatory constructs used to account for performance under stress. Physiological arousal explanations were, and still are, popular. Research at the turn of the century was generally devoid of "cognitive explanations" and emphasized primarily biologically oriented explanations. These early investigations focused on the interrelationship between physiological states and task performance. This viewpoint is examplified by the Yerkes-Dodson Law (1908) which assumed that there was an inverted-U relationship between the level of arousal and the efficiency or "goodness" of performance.

The Yerkes-Dobson Law has proven to be very popular as an explanation of performance decrement, especially under high stress conditions (Martens, 1974). Nevertheless, there are a number of problems with the Yerkes-Dobson Law. The most damning criticism against the Yerkes-Dobson Law is that it provides no clues about the underlying mechanisms and processes involved in "emotional" effects on performance. It only provides a predicted interrelationship between arousal, task difficulty, and task performance. The lack of explanatory power makes it next to impossible to account for why in some instances the arousal - performance relationship sometimes reveals an inverted-U pattern whereas in other circumstances there exists a linear relationship as

predicted by drive theory (Spence & Spence, 1956).

Arousal continued to be an important explanatory concept in many contemporary performance-related theories. Several theorists have argued that arousal effects are mediated by attentional mechanisms. This arousal-information processing relationship viewpoint was evident in Easterbrooke's (1959) cue-utilization hypothesis. He proposed that arousal affected cue-utilization in that as arousal increased there was a progressive reduction in the range of cues used by the person, which improves performance up to an optimal level of arousal. Increases in arousal beyond the optimal point, however, reduces the number of relevant cues and causes a deterioration in performance. Nideffer (1981) used Easterbrooke's theory as a conceptual base for his attention control training program for athletes. Nevertheless, Eysenck (1982) criticized Easterbrooke's theory because there is no evidence that highly aroused people are more selectively attending to cues compared to low aroused people (see Landers, 1980).

The concept of "arousal" as "emotion" is present in many theories of attention. While different theorists have emphasized different possible effects of arousal on attention, there is a general acceptance that high states of arousal produces conscious attention selectivity (Eysenck, 1982). There is also evidence that arousal affects attentional stability (e.g., Hasher & Zacks, 1979), and makes attentional processes more susceptible to distraction (e.g., Kahneman, 1973; Mandler, 1985). Nideffer (1976) suggested that increased arousal (which may be associated with anxiety) may narrow the individual's attention bandwidth, and also change the direction of attention resulting in the individual's attention becoming too external or too internal. These theoretical positions all strongly suggest that arousal is important factor in performance.

D. Sport Performance and Anxiety

Most work in sport psychology concerning the relationship between anxiety and sport has focused on either identifying a distinct sport personality or the development, testing, and predictive value of sport specific anxiety tests (e.g., Martens, 1977; Martens et al., 1983). There has been a recent surge of research in identifying factors that contribute to competitive stress (Passer, 1984, Scanlan & Lewthwaite, 1984, 1986). However, the research evidence examining the relationship between sport performance and anxiety is limited.

Sport anxiety research in the 50's, 60's and early seventies was primarily devoted towards identifying whether athletes were significantly different from the general population. This "athletic personality" view was championed by the writings of Ogilivie (1968). He argued that superior athletes are emotionally more stable, have greater resistance to emotional stress, and have lower levels of trait anxiety (cf. Martens, 1977). Numerous writers, however, challenged Ogilivie's argument. Kroll (1970), Martens (1975), and Morgan (1972), in reviewing the same literature from which Ogilivie based his findings, failed to find any psychological characteristics that discriminated superior athletes from any other group. Hardman (1973) strengthened the "no difference" view when he compared A-trait among 42 different samples of athletes from different sports and found that most athletes fell within the normal range of A-trait on Cattell's 16 PF norm tables.

The 1970's witness a shift from personality oriented questions to the development of situation- specific anxiety scales which would be stronger predictors of sporting behavior. This shift was propelled by the development of Speilberger's (1966) distinction between state and trait anxiety and Morris and Liebert (1967) distinction between cognitive and somatic anxiety. Soon numerous situation-specific scales were proposed including test anxiety scales (Sarason, 1975) and social evaluation anxiety (Watson and Friend, 1969).

Within the sport field, Rainer Martens has been the major advocate and developer of sport specific anxiety scales.

Martens (1977) published the Sport Competition Anxiety Test (SCAT), a sport-specific trait anxiety measure. The SCAT was found to be a better predictor of sport state anxiety compared to Speilberger et al.'s (1970) trait anxiety inventory. Martens found, however, that SCAT was not a predictor of sport performance (see section 3 for a more detailed description of SCAT).

A logical extension of situation-specific anxiety scales in sport was the development of a competitive state anxiety inventory (CSAI). Martens, Burton, Rivkin, and Simon (1980) modified Speilberger et al.'s (1970) STAI by identifying 10 items which were more sensitive to state anxiety changes in competitive situations. They found that CSAI was a stronger predictor of SCAT in competitive situations compared to STAI. Although CSAI has been used by some researchers (e.g., Cox, 1986), there is inconclusive evidence that CSAI is a valid predictor of sporting performance.

A recent sport specific anxiety scale, the CSAI-II (Martens et al., 1983), is based on the conceptual distinction between cognitive anxiety and somatic anxiety. Cognitive anxiety reflects negative expectations and worries about performing a task whereas somatic anxiety is indictive of perceived autonomic arousal. A third subscale that was revealed through factor analysis during test construction, is self-confidence. Martens et al. (1983) found, however, that precompetition measures of the CSAI-II subscales did not predict performance. (A more detailed description of CSAI-II can be found in chapter 3).

The development of sport-specific anxiety scales has created the potential for a more reliable and possibly valid examination of sport performance-anxiety relationships. Studies in the 1980's have attempted to investigate more carefully this relationship (e.g., Cox, 1986; Petlichkiff, Gould, Simons, & Vevera, 1985; Sonstroem & Bernardo, 1982;

Weinberg & Genuchi, 1980). At this time, however, there is little convergence in thie research to draw any conclusive statements.

Sonstroem and Bernardo (1982) investigated the relationship of state anxiety, measured by CSAI, to the performance of female intercollegiate basketball players over three games in a tournament. Performance was measured by a means of a composite score of various aspects of player's performance as well as a second measure of total points. The players were also divided into three levels of trait anxiety based on natural breaks in CSAI scores. The intra-subject performance data fit a quadratic relationship with state anxiety. All players had their best performances under conditions of moderate stress, a finding that was consistent within the three trait anxity levels. However, Cox (1986) argued that the Sonstroem and Bernardo study violated a major assumption of trend analysis on categorical data, which was that anxiety categories increase systematically as anxiety increases.

Cox (1986) investigated the relationship between performance and competitive state anxiety, measured by CSAI, in female intercollegiate volleyball players. The volleyball skills of service reception, serving, and spike performance were evaluated on a three point scale (0, 1, 2). A score of zero was assigned for failure situations, a score of 1 was assigned for any situation ranging between success and failure. State anxiety was measured before each game and was averaged across games in a match. Regression analysis found a significant linear relationship between spiking and anxiety. There was also a linear relationship between serving and anxiety in the play-offs matches. No detectable relationship was found between service reception and anxiety.

Petlichkoff et al. (1985) examined the relationship between cognitive and somatic anxiety, measured by the CSAI-II, and performance of forty pistol shooters. The CSAI-II was administered on five separate occasions immediately before shooting. Intrasubject performance analysis indicate there was a significant quadratic relationship between

somatic anxiety and performance. There was no interpretable relationship between cognitive anxiety and performance. Petlichkoff et al. suggested that somatic anxiety is probably a good predictor of shooting performance because shooting requires fine muscular control. High somatic anxiety, which is indicative of muscle tenseness, sweating and nervousness, would disrupt fine muscle control.

The cited studies failed to provide any conclusive evidence for a robust significant relationship between sporting performance and anxiety. The absence of a consistent, robust relationship is influenced by several theoretical and methological problems. These problems include problems of individual differences, within verus between subject analysis, anxiety verus arousal effects, construct validity, and measuring performance. Until these problems are rectified it is unlikely that any significant progress will be made in determining and measuring the relationship between sporting performance and anxiety.

E. Theoretical and therapeutical approaches to stress management

The negative consequences of dysfunctional emotional behavior have long been recognized in clinical psychology and psychriatry. The theraputic techniques developed to assist the individual in attaining more adaptive psychological functioning have spawn from various theoretical approaches. In many cases these treatment approaches have been modified to fit specific problems that occur in the sport setting.

There are four different models of anxiety reduction that can be adapted for use in sport (Smith, 1984). Two of these conceptual models are based on the notion of conditioning. These models of extinction and counter conditioning conceive anxiety as an emotional response and do not emphasize the role of cognitive processes. On the other hand, a third conceptual model, termed cognitive mediational, strongly emphasizes the role of thoughts, beliefs, and values in emotion and attempts to change affect elicting cognitions (Smith,

1984). The fourth model, and the model to be evaluated in this dissertation, is known as a coping skills model. This model focuses on the development of cognitive and behavioural skills of the individual in managing potentially distressing situations.

The purpose of this section will be to review each of these conceptual models and their associated therapeutic techniques, and indicate how they can be used to assist athletes in overcoming maladaptive emotional experience and behaviour. The section will attempt to show the limitations of the first three models and emphasize the power and efficacy of the coping skills approach.

Extinction Model

The extinction model is based upon learning models that postulate that fear and anxiety may be elicted by previously neutral situational cues or stimuli (CS). Through repeated pairing of the CS with a potent adversive stimuli (UCS), the CS becomes capable of elicting fear and accompaning avoidance response in the absence of the adversive stimuli. A sporting example may clarify this process. A hockey player is repeatedly body checked heavily into the boards by a certain defenseman, with the continous consequence of pain and discomfort. In a later game against the same team, the action of skating near the board within the proximity of this same defenseman elictedsfear, anxiety, and avoidance responses. In this scenerio, the defenseman and the boards are the neutral stimuli with the bodycheck and pain as the adverse stimuli.

The conditioned emotional response of fear may be established through different procedures: Estes and Skinner (1941) first superimposed a CS-UCS contingency upon an instrumental response. In this sense the neutral and adverse stimuli occur during the performance of a task. In our hockey example, the defenseman and pain occur while the player is attempting to skate along the boards. The result is a decrease in skating along the boards or in learning theory jargon, instrumental response suppression.

The conditioned emotional response may also be established through the pairing of CS & UCS separate from the instrumental response (Hall, 1986). Take the case where a coach (neutral stimulus) berates the player (adverse stimulus). The mere presense of the coach (CS) in the future may suppress performance during a practice or game.

It is also possible to develop fear, anxiety, and avoidance response through vicarious classical conditioning (Smith, 1984). Watching another athlete being seriously injured may elict fear responses under similiar environmental conditions.

Many of the factors which influence the extinction of fear are the same as those that influence fear acquisition (Tarpy, 1975). The stronger the adversive stimuli (e.g., pain or injury), the more difficult the extinction process. Another critical problem in extinction is the development of avoidance responses. For extinction to occur, the athlete must experience the conditioned stimuli in the absence of the adversive stimuli. However, the avoidance response removes the athlete from the conditioned stimulus. Removing the CS results in the reduction of fear, which reinforces the avoidance responses (i.e., negative reinforcement). These avoidance responses, such as not skating along the boards in hockey, may be totally inappropriate for successful performance.

Avoidance responses, and their subsequent reinforcement, present a dilema in the extinction of fear and anxiety. It is necessary to have the athlete experience the fear-provoking stimuli in the absence of adversive events. Therefore, what is required is to force the athlete to be exposed to the CS while preventing avoidance responses. This procedure is referred to as flooding.

Flooding is a therapeutic technique in which the athlete is exposed to the fear elicting stimuli and is prevented from making avoidance responses to reduce the fear generated by the CS (Yates, 1970). The athlete may be exposed to the CS either through imagined scenes, or IN VIVO (real situation). Prolonged exposure or "flooding" of the CS in the

absence of an adversive event will extinguish the fear (Smith, 1984). There exists some controversy as to whether the Pavlovian fear (CS-elicting fear) must be extinguished first before the avoidance responses are extinguished concurrently or independently (see Tarpy, 1975). In animal studies, Coulter, Riccio, & Page (1969) found that avoidance responses were suppressed after flooding, but subjects still demonstrated residual fear.

The technique of flooding demands a careful assessment of the kinds of situations that elict fear and anxiety. The assessment should identify the specific contextual situational information that trigger the fear. In this sense, the assessment is the critical step in helping the athlete overcome the fear. It is recommended that the athlete receive training in imagery to enhance experiencing situations in auditory, visual, kinesthetic, and olfactory-gustotory sensory modalities (Smith, 1984).

Smith (1984) gives an example how flooding could be used in an athletic setting. His hypothetical case involved a basketball player who "choked" in pressure situations. A series of distressing scenes was established that involved performance failure, and social, peer, and family disapproval and rejection. The player would vividly imagine a scene that involved "choking" and experiencing kinesthetic, olfactory, visual, and auditory stimuli associated with this "choking" behavior. The scene would be continued until there was a visible and reported reduction of anxiety. Such flooding scenes last from 30 to 40 minutes.

The Counter Conditioning Model

The counter conditioning or reciprocal inhibition model refer to procedures that strengthen alternative responses to stimuli that presently elict maladaptive behaviour (Yates, 1970). Generally, in the treatment of anxiety, this new reponse is incompatible with

anxiety. Wolpe (1958) maintained that:

> If a response antagonistic to anxiety can be made to occur in the presence of anxiety-evoking stimuli so that it is accomplished by a complete or partial suppression of the anxiety responses, the bond between those stimuli and the anxiety response will be weakened (p . 71).

Wolpe (1958) argued that the individual must be systematically exposed to the cues that trigger anxiety, but without the feared consequences occuring. The procedure of counter conditioning allows the therapist to introduce the use of pleasant events, rather than the fear-provoking procedure used in flooding. The procedure in which the process of counter conditioning is applied is termed systematic desensitization.

As the term implies, systematic desensitization involves the systematic gradual counter conditioning of anxiety such that the individual becomes desensitized to the cues that formerly elicted the anxiety states. Wolpe (1958) stressed the use of relaxation as a preferred alternative response, probably because relaxation activates parasympathetic neural activity which is incompatible with the sympathetic activity activated during anxiety states. However, other behavioral responses such as assertive behaviour, sexual behaviour, and eating may also be incompatible with anxiety (Yates, 1970), but their use may not be easy or dependable (Smith, 1984). Systematic desensitization requires that the therapist work with the client in identifying the stimuli that trigger the anxiety. This assessment stage is critical to the treatment of anxiety as these stimuli are used in the construction of hierarchies used in the gradual counter conditioning procedures.

Systematic desensitization involves three stages. The first stage is training in deep muscle relaxation. The second stage is the construction of anxiety hierarchies, usually consists of 10-15 scenes, arranged in terms of anxiety-provoking intensity from lowest to highest. The anxiety hierarchy is constructed from the case history of the individual,

special investigation into the area of difficulty and responses to the Willoughly questionnaire and Fear Survey Schedule (Yates, 1970). Hierarchy construction occurs during the period of relaxation training.

The final stage of systematic desensitization is the application of desensitization by moving systematically through the anxiety hierarchy. The individual session of application involves having the athlete attain a state of deep relaxation and then imagining a scene (starting at lowest) for a few seconds. If any anxiety is experienced, the athlete signals the therapist and the scene is terminated. If no anxiety is present, the scene is presented for longer periods of time. After the first scene is counter conditioned, the therapist preceeds to the next scene. Often the counter conditioning generalzes to the next scene. In any case, the same procedure is used through each scene in the hierarchy. Systematic desensitization has been used extensively in the treatment of anxiety, with over 100 controlled studies demonstrating effective treatment (Rimm & Masters, 1979; Smith, 1984). However, the major drawback of systematic desensitization is its heavy reliance on having a well trained therapist. Also, there is some question as to the generalization of treatment effects to new or different potentially anxiety-provoking situations.

Cognitive Mediational Model

Another major influence in contemporary approaches to stress management was the growing recognition of cognitive mediational processes in emotion. Theories such as Arnold (1970), Beck (1976), Ellis (1962), Lazarus and Folkman (1984), Weiner (1980), and Mandler (1985) have collectively recognized the major role cognition plays in stress reactions. The cognitive mediational perspective advocates that modifying irrational or maladaptive ideation will change maladaptive behaviour or, conversely, result in more desired behaviour. This process of changing thoughts, values, and beliefs that often elict

stress-related emotions such as anger, fear, and anxiety is termed cognitive restructuring.

Many cognitive approaches to either the prevention or treatment of maladaptive ideation and behaviour involve using cognitive restructuring (e.g., Beck, 1976; Ellis, 1962, 1977; Goldfried and Davison, 1976). Cognitive restructuring entails having the client monitor and change thoughts, beliefs, and values which influence the evaluation of a stressor and produce emotional experience and behaviour. Although there are differences among the various clinical approaches to cognitive restructuring, they all generally employ structured protocols in teaching clients more and better adaptive ways of evaluating situations.

Albert Ellis (1962, 1977) and Aaron Beck (1970, 1976) have been strong proponents of the application of cognitive restructuring as a coping skill to change maladaptive thoughts and behaviour. Both theorists believe that many dysfunctional behaviours are caused by distorted or unrealistic cognitions. There are, however, some important differences between Ellis and Beck in the assumptions behind the application of cognitive restructuring. Since cognitive restructuring is critical to Smith's (1980) stress management program, a brief review will follow of both Ellis's (1977) Rational Emotive Therapy and Beck's (1976) Cognitive Therapy.

Albert Ellis --- Rational Emotive Therapy

Rational Emotive Therapy (RET) (Ellis, 1962, 1977) posits that many maladaptive behaviours are mediated by the individual's attitudes towards, and assumptions about, the world around him/her (Goldfried, 1980). It also assumes that cognitions, emotions, and behaviours interact and have a reciprocal cause-and-effect relationship (Corey, 1986). According to RET, rational examination of attitudes, beliefs, thoughts, and behaviours will

lead to future adaptive behaviour.

Ellis (1977) argued that emotional behaviour is primarily determined by cognitive evaluation of situations. He developed a conceptualization of the emotion complex, termed the A-B-C complex, that allowed individuals to understand the role of cognitions in adaptive and maladaptive behaviour.

The RET formula consists of breaking down the situation-behaviour complex into components and analyzing the contribution of each component. The basic components are the activating experience (A), belief system (B), and consequences (C). through the rational analysis of each of the three components, individuals can learn to dispute (D) their maladaptive behaviours and produce adaptive effects (E). The RET framework assumes that the activating experience (A), while contributing to the consequence (C), does not really cause it. It is the thought processes which occur between A and C that determines the response to A. These thought processes are determined by underlying beliefs and values (Ellis, 1977). It is critical in RET therapy that the client understands that thoughts and beliefs, not the situation per se, are the critical determinants in producing feeling and actions to any given event (Ellis, 1977).

Ellis (1977) separates beliefs into two general categories: rational beliefs and irrational beliefs. According to the RET framework, the individual's response to a given situation is determined by the relative influence of rational and irrational beliefs. Irrational beliefs generally produces maladaptive behaviour, whereas rational beliefs generate adaptive behaviour.

Based on the RET approach, Ellis (1977) suggested that anger and anxiety are produced by absolutistic, command-oriented thinking. The three basic ways that the individual uses this type of thinking are, a) putting others down, b) putting oneself down,

c) putting down the conditions of the world in which one lives (Ellis, 1977). Ellis (1977) suggested that angry people generally hold beliefs that are captured by the following four general statements:

1. How AWFUL for you treating me so unfairly
2. I CAN'T STAND you treating me in such an irresponsible and unjust manner
3. You SHOULD NOT, MUST NOT, behave that way towards me.
4. Because you have acted in that manner towards me, I find you a TERRIBLE PERSON who deserves nothing good in life, and who should get punished for treating me so.

Once the individual is able to understand the role of irrational beliefs in maladaptive behaviour, the next step is to challenge these beliefs. The individual must recognize the irrational beliefs and consistently dispute these beliefs. Disputing of beliefs involves three components: detecting, discriminating, and debating. Thus the individual must detect their main irrational beliefs, discriminate them clearly from rational beliefs, and then forcefully debate these irrational beliefs. Successful disputing and debating leads to new cognitive and behavioural effects (E).

Aaron T. Beck --- Cognitive Therapy

Beck (1976) proposed a set of treatment techniques, which are similar to RET, that are designed to modify or eliminate maladaptive behaviour through modification of distorted ideation. Beck's techniques, though developed primarily for the treatment of depression, can be applied in changing most maladaptive behaviour that is mediated by distorted cognitions. For example, Meichenbaum (1985) has incorporated many of Beck's ideas into Stress Inoculation Training, which has been applied in the treatment of phobias and anxiety. Beck (1976) suggested that maladaptive behavior could be modified through a

careful analysis of cognitive distortions of reality. Beck and his associates (Beck, 1976, 1984; Bedrosien and Beck, 1980) argued that there are several common cognitive distortions that produce maladaptive behavior. The following types of cognitive distortions, although not exhaustive, have particular relevance in the sport setting.

1. Selective Abstraction

This cognition involves focusing on a specific situation or a detail such that the global significance of a situation is missed. Take the example of the coach selectively attending to one player who is not paying attention, while ignoring the many players who are alert and interested. The coach comes to the false conclusion that the team is not interested in his coaching

2. Arbitary Inference

This distorted cognition refers to coming to a conclusion based upon irrelevant, improper, or inadequate information. This cognition may occur in a player who interpretes every competitive situation as an opportunity to fail.

3. Overgeneralization

Overgeneralizations are predictions based upon a single incident or a blanket judgement that does not consider the diversity of the situations or people. Take the example of the player who says, "I just can't serve in important matches", because he missed an important serve.

4. Polarized Thinking

This distortion in thinking involves interpreting events into two extreme catergories or dichotomies; good or bad, success or failure. Polarized thinking appears to be common in sporting situations The media and coaches are often espousing the addage that, "There are winners and losers". A player may view all performance

below that of actually winning as inadequate. Polarized thinking prevents the player from viewing performance as lying along a continuum ranging from poor to excellent.

5. Magnification and exaggeration

This type of thinking is charaterized by emphasizing the most unpleasant and negative consequences that can or did occur in a situation. An anxiety prone player, after making one mistake, may believe she is going to have a poor game.

6. Assuming excessive responsibilty

The meaning of this attribution is fairly straight forward and probably occurs often in players in responsible, high profile positions. A soccer goalkeeper, after allowing a decisive late goal, may believe she is totally responsible for the defeat, despite the fact there were twenty-one other players involved in a game lasting ninety minutes.

7. Dysfunctional attitudes about pleasure verus pain.

This type of cognitive distortion refers to the belief that some people have regarding the conditions for attaining true happiness and success. [illegible] of unrealistic goals as a basis for self-respect may lead to maladaptive behavior such as cheating and depression. For example, a volleyball player is convinced that his future success and self-worth are contingent upon winning a particular championship. Failure to meet this goal may provoke a loss of self-esteem.

Cognitive therapy offers highly structured procedures to change distorted cognitions. One such procedure is distancing which refers to the process of having the athlete reevaluate engrained beliefs and judgements (Bedrosien and Beck, 1980). With the assistance of the therapist, the athlete is encouraged to make explicit all assumptions

underlying a certain thought pattern. The athlete then rationally examines the accuracy and functional utility of these assumptions.

The use of the distancing technique may be observed in the case of the soccer goalkeeper who, after her team lost several key games, repeatedly expresses the belief that The use of the distancing technique may be observed in the case of the soccer goalkeeper who, after her team lost several key games, repeatedly expresses the belief that she is terrible and a failure. This belief probably reflects selective abstraction, overgeneralizing, and assuming excessive responsibilty. The first step is for the therapist to have the player provide more details. Did she feel the same about life in general or was the belief soccer specific? Let us assume that the belief is confined to soccer. The therapist then inquires about responsibilities, specific areas of difficulties, areas of success, types of coach and teammate feedback, and other factors. When the components of her responsibility and performance as a goalkeeper are broken down and analyzed separately, then the player can rationally analyze her own performance. As the player distances herself from the global cognitions of, "I'm terrible and a failure", she can then focus on some concrete problems with her performance. This process will make it easier to develop solutions to the problem.

A potential problem with cognitive therapy, as well as RET, is that it appears to be highly dependent on the therapist, rather than emphasizing self-regulation by the athlete. Since the techniques were developed for a clinical population it is easy to understand the strong role of the therapist. Nevertheless, some of the techniques could be adapted for use in the sport setting to promote self-regulation (see Kirschenbaum, 1984)

Coping Skills Training Model.

The fourth model of managing adversive emotional states is the coping skills model. Many of the coping skills training approaches are rooted in the transactional stress perspective which holds that stress occurs from a transaction between environmental events and the individual's appraisal of these events and his/her ability to manage these events (Lazarus and Folkman, 1984). The coping skill model addresses the important role of coping with potentially stressful situations.

In the sport setting there are numerous potential stressors. It would be inappropriate or unrealistic to completely avoid many of these stressors. Therefore, for the athlete to perform effectively, it may be argued that it is necessary to have developed effective coping skills (Long, 1980). Coping may be defined as:

> constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person (Lazarus and Folkman, 1984, p.141).

Coping may be divided into two general categories: emotion focused coping and problem focused coping (Lazarus and Folkman, 1984). Emotion focused coping is aimed at regulating emotional responses to an event. Cognitive strategies such as avoidance, re-labeling, denial, minimizing, and positive comparisons may be included under the heading of emotion focused coping. Some of these cognitive strategies are equivalent to reappraisal (e.g., "I decided that there are more important things to worry about than losing the championship game, after all it is only a game"), whereas other cognitive strategies (e.g., denial) do not change the appraisal of a situation but simply direct attention away from the problem (Lazarus and Folkman, 1984).

Problem focused coping involves problem-oriented strategies directed towards changing environmental factors and directed at changing the individual. External factors may

included problem- solving strategies for changing environmental pressures, removing barriers, whereas problem-oriented strategies centered at the self include learning new skills, changing levels of aspirations, formulating new standards of behavior, and so on (Lazarus and Folkman, 1984). Probably the most common problem focused skills applied in athletics are learning new or better technical and strategic skills.

It is easy to make the incorrect assumption that all coping is effective. Roskies and Lazarus (1980) have identified three ways in which ineffective coping may produce more problems than no coping. The first way is through direct tissue damage. Attempting to manage stress through excessive drinking, illicit drug abuse, smoking, and overeating may result in damage to the body and mind, further excerbating the problem. The second way is through indirect tissue damage caused by excessive sympathetic nervous system stimulation, resulting in disease states such as uclers, coronary heart disease, and hypertension (Everly and Rosenfeld, 1981; Selye, 1976). The third way is interfering with employing adaptive behaviors. Ignoring chest pains, lumps in the breast, pain in joints, excessive fatigue, and blood in the urine may reduce immediate emotional distress but at the cost of receiving medical care (Gordon, 1986; Roskies & Lazarus, 1980).

It is important that the individual learn effective coping skills to manage potentially stressful situations. The goal of skill training programs is to help the person develop a repertoire of coping skills to manage stress that will generalize across a wide variety of potentially stressful situations (Meichenbaum, 1977; Smith, 1984).

There are four coping skills training programs that are widely recognized in the literature and that have been developed for or adapted for use in the athletic setting: Goldfried's (1971) Self-control desensitization, Suinn and Richarson's (1971) Anxiety management training, Meichenbaum's (1977, 1985) Stress Inoculation Training and Smith's (1980) Cognitive-affective Stress Management Training. These programs, although

differing in detail, share many common features:

a. teaching the individual the role of cognitions in producing stressful situations.

b. training in monitoring of maladaptive thoughts and behaviors

c. training in the use of active coping skills such as positive self- statements, images, and relaxation training. (Diekis, 1983; Long, 1980).

Self-control Desensitization

Goldfried proposed a new conceptualization of the systematic desensitization procedure. Wolpe (1958) had argued that SD, which was the most popular and effective behavioral treatment for reducing fear and phobias, was based on the passive process of deconditioning or reciprocal inhibition. Goldfried (1971) argued that rather than through the process of reciprocal inhibition, SD was effective because people learned an active coping skill. He suggested that mediational processes operate in learning to become aware of internal cues that signal tension associated with anxiety.

> One can maintain that systematic desensitization evokes not so much passive "reciprocal inhibition" as it does the active building in of muscular relaxation response and cognitive reliability into the r-s mediation sequence (Goldfried, 1971, p.228).

Goldfried proposed a number of modifications to the traditional SD procedure to emphasize self-control active coping. Clients were instructed to use tension as a signal to use relaxation skills to reduce arousal. Unlike traditional SD in which clients are asked to terminate imagining scenes when anxiety occurs, Goldfried proposed that clients maintain anxiety provoking scenes while attempting active coping skills. Goldfried argued that active coping during anxiety provoking scenes would be more transferable to the real world.

He also emphasized that the client practice the active coping skills in naturally occuring situations; or IN VIVO.

Anxiety Management Training

Suinn and Richarson (1971) developed a nonspecific behavioral therapy program for anxiety control termed Anxiety Management training (AMT). They proposed AMT because of several perceived deficiencies with the systematic desensitization procedures. They felt that constructing anxiety hierarchies was too time consuming and that systematic desensitization programs took too long. Their primary objection, however, was that SD did not teach people how to manage anxiety and, therefore, the individual does not become less susceptible to future unpredictable anxiety provoking situations. The purpose of AMT, in contrast to SD, is to teach individuals active coping skills to handle future problems.

The AMT program involves:

1. The use of instructions and cues to assist clients in imaging scenes that produce anxiety responses. Fantasy narration and mood music can also be added to induce arousal.
2. Training the clients to develop competing responses such as relaxation, success or competing feelings (Suinn and Richardson, 1971).

The basic procedure of AMT is to have clients respond to anxiety responses with muscle relaxation and visualization. Later in training, the anxiety responses serve as cues for the clients to respond with the active coping skills (Diekis, 1983).

The theoretical basis of AMT is founded upon standard S-R behavioral psychology. The anxiety response functions as a discriminative stimuli. The individual is conditioned to respond to these stimuli with coping responses that are incompatible with the stimuli, and

remove the anxiety stimuli through reciprocal inhibition (Suinn and Richardson, 1971).

Anxiety management training has been shown to be an effective program to help ameliorate anxiety. Suinn and Richarson (1971) found that AMT was as effective as standard desensitization in treating mathematics anxiety. Deffenbacher and Shelton (1978) found similar results to Suinn and Richardson in the treatment of test anxiety. However, follow-up assessments revealed that the AMT group reported significantly less anxiety compared to the SD group.

Suinn and Richarson (1971) and Goldfried (1971) both made significant advances in the treatment of anxiety compared to earlier extinction and counter-conditioning approaches. Their re- conceptualization of the counter-conditioning paradigm, with a shifting of emphasis to using relaxation as an active coping skill, has been influential in the development of active coping skills programs like Stress Inoculation Training (Meichenbaum, 1985) and Cognitive-affective Stress Management Training (Smith, 1980).

Stress Inoculation Training

Stress Inoculation Training (SIT) is a cognitive-behavioral approach for preventing and treating stress related disorders. SIT is not just a single technique, it is " a generic term referring to a treatment paradigm consisting of a semi-structured, clinically sensitive training regimen" (Meichenbaum, 1985, p.21). The SIT program is eclectic, combining relaxation training, cognitive restructuring, imagery, role playing, modeling, self-monitoring, self-instruction, didactic teaching, and Socratic discussion (Meichenbaum, 1985). The specific procedures employed in SIT depend upon the target population. The goal of SIT is to teach the client a comprehensive and flexible set of coping behaviors that can be utilized in a number of stress related situations (Jaremko, 1984).

The SIT program can be divided into three overlapping phases: the conceptualization

phase, skill acquisition and rehearsal phase, and application and follow through phase (Meichenbaum, 1985). The conceptualization phase serves to establish a rapport with the athlete and help him/her gain a better understanding of the transactional nature of stress. During the skill acquisition and rehearsal phase, the athlete develop and rehearse a variety of coping skills. The third phase of application and follow through includes both imaginal and behavioral rehearsal as well as graded exposure in real life situations. Because SIT is conceptually similar to Cognitive-affective Stress Management Training, each of the phases will be described in greater detail in the following sections.

Conceptualization Phase.

The purpose of the conceptualization phase is to provide the athlete with a conceptual framework for understanding the stress process. The scientific validity of the framework is not as important as the plausibility to the athlete (Meichenbaum and Cameron, 1983). Unlike Smith's (1980) stress management program, the SIT program does not provide a explicit model of the the transactional nature of the stress response to the athlete, although some investigators of SIT have used explicit models such as an input-output systems model (e.g., Deikis, 1983).

During the conceptualization phase, the trainer attempts to determine the athlete's stress related problems. The athlete is assessed by means of interviews, questionnaires, self-monitoring procedures, imagery-based techniques, and behavioral assessment (Meichenbaum, 1985). The trainer also assesses the athlete's expectations and tries to establish short, intermediate, and long-term goals.

Meichenbaum (1977) suggested that the conceptualization phase conclude with a discussion encouraging athletes to view the stress reaction as a series of stages. The four stages are: a) preparing for a stressor, b) confronting or handling a stressor c) possibly

being overwhelmed by a stressor and; d) reflecting upon and reinforcing oneself for having coped. This cognitive-behavioral approach of dissecting a situation into components helps the athletes to apply appropriate coping skills to alleviate or eliminate the effects of the stressor (Meichenbaum, 1977).

Skill acquisition and rehearsal phase

The objective of the skill acquisition and rehearsal phase is to ensure that the athlete develops the capacity to effectively execute coping responses (Meichenbaum, 1985). The athlete learns a variety of coping skills to be employed at each of the four stages of the stress reaction. The coping skills to be taught include both problem focused and emotion focused coping techniques. The actual types of coping skills to be taught depend upon the target population and the goals of the treatment.

One emotion focused coping skill taught in most SIT programs is training in relaxation (e.g., Deikis, 1983; Novaco, 1977; Ziegler, Klinzing, & Williamson, 1982). No one specific relaxation technique is specified in SIT. Meichenbaum (1985) noted that there are a number of diverse relaxation techniques and that no one approach appears to be more beneficial than any other. Nevertheless, many investigations into the effectiveness of SIT have used some variant of Jacobson's (1929) progressive relaxation procedure (e.g., Deikis, 1983; Novaco, 1977; Turk, Meichenbaum and Genest, 1983). Whatever the type of relaxation procedure employed, it is important that the relaxation training is to be used as an active coping skill, not just as a method to relax (Meichenbaum, 1985).

Cognitive coping skills are introduced in the SIT program with the suggestion that the cognitve strategies can be used to control the stress response (Meichenbaum, 1977, 1985). The SIT program employs co[redacted]e skills such as problem solving, communication skills, self-instructional training, a[redacted]tive restructuring.

The major cognitive strategy used in almost all applications of SIT is self-instructional training (Meichenbaum, 1985). Self- instructional training involves the development of strategy based self statements that can be used to overcome the stress reaction (Meichenbaum and Cameron, 1983). The use of self statements is introduced with the suggestion that maladaptive and adaptive actions are mediated by thoughts the athlete says to himself. The athlete is shown how the self statements can be applied at the four stages of the stress response (see Crocker & Gordon, 1986; Meichenbaum, 1985).

Specific coping self statements are tailored to the needs of the specfic target population. The athlete is encouraged to develop self statements that are personally meaningful (Meichenbaum, 1985). Examples of self statements that are useful in anger control (Novaco, 1977) are "Keep your cool, he's losing his", "take a breath and relax". Sport specific self statements that may be appropriate for volleyball are, "attack the ball", "get in the ready position", "float serve".

The objective of the application phase is to have the athlete employ acquired coping skills in stressful situations. The SIT program uses paced mastery, in which small manageable units of stress are introduced (Meichenbaum, 1977, 1985). Paced mastery provides 'inoculation' against greater intensities of stress (Meichenbaum, 1977). The use of paced mastery in SIT contrasts with Smith's (1980) SMT program, in which induced affect is employed. The induced affect procedure involves having the athlete vividly imagine a stressful event, then "turn it off" by the use of an intergated cognitive-somatic coping response. Paced mastery, on the other hand, is based upon learning to cope with small manageable units of stress (Meichenbaum, 1977).

The SIT program may employ a number of techniques including coping imagery, modeling, role playing, and graduated IN VIVO practice. The specific techniques used are tailored to the needs of the athlete. For example, Novaco (1977) used both imaginal

provocation and role playing to enhance anger control, whereas Diekis (1983) used symbolic modeling, imagery, and graded IN VIVO practice to enhance stress prevention in divers.

The general format for the application of the SIT technique involves having the athlete and trainer generate a hierarchy of stressful situations, ranging from least to most stressful. When the athlete experiences stress in one of these situations, he/she is asked to cope with it by using the acquired coping skills. The athlete is encouraged to use the four stage approach to handling the stressor. Once the athlete is able to handle a stressful situation in the hierarchy, he/she should proceed to the next situation. The scene allows the athlete to rehearse coping skills under increasingly more stressful situations.

Research Evidence.

Stress inoculation treatment has been applied to a number of diverse populations. Various forms of SIT have been investigated in anger control (Feindler and Fremouw, 1983; Novaco, 1975, 1977), test anxiety (Meichenbaum, 1972; Nye, 1979), public speaking (Jaremko, 1980); phobias (Meichenbaum and Cameron, 1972), general life stress (Long, 1984, 1985), chronic pain (Turk, Meichenbaum, and Genest, 1983), parachutists (Dinner and Gal, 1983), runners (Ziegler et al., 1982), scuba divers (Diekis, 1983), and abseiling (Mace and Carroll, 1985). Meichenbaum (1985) argued that the accumulated evidence provides promising support, but that SIT is still in the preliminary stages of development.

Although SIT has been used primarily as a treatment procedure, there are several studies that have attempted to use SIT as a stress prevention tool (e.g., Diekis, 1983; Novaco, 1977). SIT has also been to sport settings. Deikis (1983), Ziegler et al. (1982) and Mace and Carroll (1985) have applied SIT in skill performance settings to train individuals to handle stress, with mixed results.

F) Cognitive-affective Stress Management Training.

Ronald E. Smith and his associates (Smith, 1980a, 1980b, 1986; Smith and Ascough, 1985; Smith and Smoll, 1978, 1982) developed a framework for stress management entitled Cognitive-affective Stress Management Training, or SMT for short. Like stress inoculation training, SMT is a cognitive-behavioral approach designed to enhance the learning of both cognitive and behavioral coping skills. The goal of SMT is to teach the athlete to utilize an "integrated coping response" having both cognitive and behavioral components which can be generalized across potentially stressful situations.

A fundamental difference between SMT and SIT is the method used to rehearse the acquired coping skills. Unlike SIT, which uses a graduated stress induction method, SMT employs a modification of a procedure known as induced affect (Siprelle, 1967). The induced affect (IA) procedure allows the rehearsal of coping skills under high emotional arousal conditions (Smith, 1984). When the athlete attains a level of high arousal, he/she is asked to "turn off" this heightened emotional state by employing the acquired coping skills. The induced affect procedure will be elaborated on in a later section.

Smith and his associates have examined the stress process from a component analysis perspective of the relationship between the athlete and the environment. Clearly, Smith (1986a, 1986b) supports a transactional perspective of the stress process. He has developed a conceptual model (see figure 2) that encompasses the dynamic relationship between the situational demands, the athlete's evaluation of the situation and of his/her coping resources, the athlete's physiological responses, and the athlete's behavioral actions to cope with the situation. Each of these four components are influenced by the athlete's motivational and personality charateristics (Smith,1980a).

The intervention procedures utilized in SMT were derived primarily from the

component analysis of the stress process. The SMT framework has focused on intervention aimed specifically at the athlete. Cognitive and somatic relaxation skills are directed towards controlling the physiological arousal responses. Cognitive coping skills acquired through self-instructional training and cognitive restructuring help the athlete manage the evaluation of the situation and to employ appropriate cognitive coping skills.

Intervention strategies to help the athelete manage stress are available beyond the athlete centered methods employed in SMT. Smith (1980a, 1986a) argued that the interrelationship between all the components must be considered in the stress process. The SMT framework does not identify any specific intervention strategies to control the situational demands. According to the transactional perspective, however, the stress process is dynamic. Any changes in the athlete's coping skills should have an effect on the situation. To gain a clearer perspective of Smith's formulation, a brief review will follow of Smith's (1986a) component analysis of the stress process.

The first component of the model concerns the demands of the situation upon the athlete. Smith and Smoll (1982) suggested that the stress-eliciting situation may be internal or external in origin. In sporting situations there are numerous external factors that may generate stress. These factors include the behavior of teammates, officials, coaches, opponents, parents, friends, spectators, field conditions, closeness of score, team and/or personal performances (see Kroll, 1982; Passer, 1983; Scanlan and Passer, 1978; Smoll, 1986). Furthermore, internal states such as expectations and memories of past performances will also interact with the ongoing situation to produce psychological stress in the athlete (Smith and Smoll, 1982).

Barbara Brown (1984) has identified several categories of sources of stress that may impinge upon the individual. These sources include personal circumstances, social change, social pressures, environmental influences, unhealthy lifestyles, and being ill or

handicapped. Many athletes have and will face stressors such as adjusting to school, financial problems, aging, retirement, discrimination, behavioral criteria, performance criteria, allergens, noise, poor weather, late transportation, drugs, injury, and a host of other stressors. Many of these stressors will occur outside of the athletic setting but are very capable of contributing to the stress cycle in sport.

The cognitive components of the SMT model emphasizes that the situational demands affect emotionality through the mediating role of thought (Smith and Smoll, 1982). The athlete's emotional experience and behavior depends primarily upon how the athlete perceives the situational demands. In line with Lazarus and Folkman's (1984) arguments, Smith (1986a) posited that any imbalance between the perceived environmental demands and the athlete's coping resources will result in stress. Thus, the volleyball player who perceives her blocking ability to be inadequate to effectively block the opposing hitter may perceive the situation as threatening. A second important factor to consider in the cognitive component is the perceived possible consequences of failing to meet environmental demands (Smith, 1986). If the consequences threatens harm or loss (Lazarus and Folkman, 1984), the athlete will likely perceive the situation as stressful.

According to Beck (1976), cognitve distortions like magnification and exaggeration of consequences often produces maladaptive behavior. If the athlete catastrophizes about the consequences of failure, the athlete will experience stress. Obviously, the personal meaning attached to the consequences of failure are important. If the athletic performance is strongly associated with personal self-worth, the consequences of failure leave the athlete far more vulnerable to stress (Smith, 1986a).

The physiological components of the SMT model may be important in understanding and intervening in the stress process. The SMT model assumes that the physiological arousal elicted by the cognitive appraisal process. Any situation appraised as threatening triggers

arousal as part of the mobilization of coping processes (Smith, 1986a). Physiological arousal, however, may influence the ongoing cognitive appraisal process by providing feedback about the intensity of the emotion being experienced. An athlete may evaluate high levels of arousal as nervousness, anxiety, or another negative affective state. This appraisal may produce more arousal and continue the stress spiral.

The fourth component of the SMT model represents the athlete's actions or responses that are generated in response to the perceived situational demands. These task-oriented, social, and coping actions are determined by the three components of situational demands, cognitive evaluation, and physiological responses. These actions, in turn, effect the perceived balance between situational demands and the coping resources and appraisal processes of the athlete (Smith, 1986a).

Smith (1980a) argued that the personality and motivational factors create predispositions within the individual to seek out specific situations and to think, perceive, and respond in certain ways. Often the types of goals and incentive motivation will determine the particular situations the athlete will experience (see Alderman and Wood, 1976; Carron, 1984).

A practical advantage of the SMT model is that it has clear implications for the development of the intervention strategies (Smith and Ascough, 1985). SMT promotes a general, flexible approach to intervention. The most time-consuming intervention would probably be required to effect change at the motivational and personality level (Smith and Smoll, 1982). Direct intervention at the four primary components of the model -- situation, cognitive appraisal, physiological arousal, and behavior, are more advantageous in practical and economic terms to reduce stress.

At the situational level, changes in key environmental features may help reduce stress. There is strong evidence that coach/athlete relations have a major impact on sport

participation (Martens, 1978; Smith, Smoll, Hunt, Curtis, and Coppel, 1979). Smith has provided evidence that training coaches to relate more effectively to children results in more positive coach-athlete evaluations (Smith, Smoll, and Curtis, 1978; Smoll and Smith, 1979).

Other changes at the situational level that are effective in reducing stress for the athlete are instructing parents in ways to reduce the contribution they make to their children's stress, making modifications in the sport itself (Orlick, 1986), and teaching athletes how to influence the environment. Modifications in the sport may include using a smaller ball, smaller field, and fewer players, such as the case of mini-soccer which was developed for children under the age of ten. Lastly, athletes can influence their environment by learning the necessary skills to modify or overcome adversities in the game situations.

The athlete's level of physiological arousal can be modified by arousal reduction skills such as muscular relaxation, meditation, hyponosis, and biofeedback (Costa, Binaccorsi, and Scramali, 1984; Griffiths et al., 1984; Unestahl, 1986). Other activities or measures, including the use of alcohol, certain drugs, eating, or muscular activity can be used to reduce arousal (Smith and Ascough, 1985).

The cognitive appraisal process is the key component in the SMT model in which to introduce intervention strategies. Cognitive appraisal creates the psychological reality to which the athlete responds. It is the appraisal of the situation that elicts physiological arousal and triggers behavior. Distress is not triggered directly by the situation but by what people think about the situation and how they evaluate their ability to cope with this situation (Smith and Ascough, 1985). Cognitive appraisal is linked conceptually to Bandura's (1977) notion of self-efficacy. If the athlete does not believe he/she has the skills to handle a situation, then he/she is more likely to exhibit characteristic stress responses such as anxiety, anger, and avoidance behavior.

Smith and Smoll (1982) suggested that the thought patterns of many high-stressed athletes are dominated by worry. Consistent with the views of Ellis (9177) and Beck (1976) they argued that if the athlete can be taught to discover, challenge, and change these internal self-statements, he/she can learn to keep the stress response within managable levels (Smith and Ascough, 1985). Furthermore, if athletes can learn to develop effective coping skills, they will be better able to handle stressful situations.

Intervention at the cognitive level has an obvious advantage over the situational level. For example, if young athletes are exposed only to effective coaches, athletes may not develop the necessary coping skills required to later handle a critical coach. If the athletes, however, develops good cognitive coping skills, they will be better able to handle both effective and ineffective coaches. Furthermore, effective coping skills can be applied in other potentially stressful situations such as work and interpersonal relationships.

The SMT program

The SMT program can be divided into five partially overlapping phases: 1) pretreatment assessment, 2) treatment rationale, 3) skill acquisition, 4) skill rehearsal, and 5) post-treatment evaluation (Smith and Ascough, 1985).

Pretreatment assessment

When administered on a group basis, the SMT assessment phase involves primarily paper and pen measures. In the case of an individual, assessment may take several sessions to specify when, where, and how the stress reaction occurs and the effects on the performance (Smith and Ascough, 1985). The assessment procedure also attempts to specify the athlete's behavioral and cogntive skills and deficits.

Treatment rationale

The treatment rationale involves introducing the SMT conceptual model to the athlete.

The purpose of this conceptual phase, as in SIT, is to help the athlete understand the nature of the stress response and to provide a rationale for the treatment or prevention program (Smith and Ascough, 1985; Smith and Smoll, 1982). The treatment must have face validity: that is the program must appear logical to the athlete. If the athlete fails to believe that the program makes sense, then he/she is less likely to comply with the training program.

Smith and Ascough (1985) emphasized that two important points are stresed during the rationale phase. First, the SMT program is not psychotherapy but an educational program. The notion is introduced that those people who successfully cope with stress have been fortunate in having previous life experiences that enable them to learn the kinds of coping skills that will be taught in the program. The second point is that coping skills and abilities that the athlete acquires will be a function of the athlete's effort and practice. The goal of the treatment is to ensure that the athlete takes responsibility for any positive changes (Smith and Ascough, 1985). The concept of self-responsibility and self-regulation is a crucial aspect of skills training programs (see Kirschenbaum, 1984).

Skill acquisition.

The purpose of the skill acquisition phase is to teach the athlete an integrated coping response, having both somatic and cognitive components (Smith and Ascough, 1985; Smoll, 1986). This phase involves, a) learning muscle relaxation skills and, b) the identification, discrimination, and replacement of dysfunctional stress-eliciting ideas and self-statements with functional specific cognitions to reduce stress (Smith and Smoll, 1982). The training in relaxation skills is a variant of Jacobson's (1929) procedure of deep muscle relaxation. A key feature of the relaxation training in SMT is the use of gradual relaxation during the tension-relaxation cycle. The SMT programs asks the athlete to tense the muscle, slowly relax halfway and hold, and then slowly relax completely (Smith and Smoll, 1982). Smith and Smoll argued that the SMT procedure enhances the athlete's ability to discriminate

between slight changes in muscle tension. Although the initial relaxation is done by the trainer, most relaxation sessions are done by the athlete alone on a daily basis as hommework assignments (Smith and Ascough, 1985).

Training in cognitive coping skills is done concurrently with relaxation training (Smith and Ascough, 1985). Athletes are told that the thoughts and self-statements that elict emotional responses are generally automatic. It is emphasized that with effort, athletes can learn to monitor their thoughts, logically evaluate their beliefs that induce these thoughts, and develop new adaptive statements to replace the dysfunctional thoughts (Smith and Ascough, 1985). In this sense, SMT relies heavily on the conceptualizations of Ellis's (1977) Rational Emotive Therapy.

The SMT program has used two related procedures in training cognitive coping skills, namely cognitive structuring, and self- instructional training. In cognitive restructuring, dysfunctional stress elicting ideas are rationally analyzed, challenged, and replaced with ideas that are rationally sound and will help reduce or ameliorate the stress process. For example, the statement, "It would be awful if I failed" is replaced with the more adaptive statement, "All I can do is give 100%".

The self-instructional training (Meichenbaum, 1977) involves the development of specific task relevant self commands. Examples of self statements are, "Get in the ready position", "Take a deep breath and relax", "Pass with the legs". Self instructional training is very helpful for young athletes or athletes that are not psychologically minded to have good introspective skills (Smith and Smoll, 1982). Self instructional training appears to be more readily applied than cognitive restructuring (Smith and Ascough, 1985).

Skill rehearsal

Coping skills must be rehearsed and practiced under conditions that are similar to "real-life" conditions in which the skills will be employed. The SMT program employs a

modification of a procedure known as induced affect (Sipprelle, 1967). Induced affect (IA) is thought to facilitate the rehearsal of cognitive and somatic coping skills under conditions of moderate to high arousal. In the SMT program, induced affect is designed to allow rehearsal of coping skills in the presence of two types of cues: a) internal cues generated by the emotional arousal, and b) imaginal representation of the external situations that often produce stress.

The use of IA in SMT requires that the athlete imagine a stressful scene as vividly as possible. The trainer instructs the athlete to focus and concentrate on the feeling induced by imagery, and suggests that the feeling will grow stronger and stronger. All the physical indications of arousal are reinforced and encouraged. When the athlete reaches a high level of arousal, he/she is asked to "turn it off" with the coping skills that have been learned. At first, only the muscle relaxation skills are used to reduce the arousal. In the second stage, only the self- statements are used to reduce the high arousal state. Finally, both types of coping responses are combined into an intergrated coping response that links the self statements with the breathing cycle of the relaxation skill (Smith, 1984; Smith and Ascough, 1985). As the athlete inhales, he/she says a self statement. During the exhaling cycle, he/she emits a relaxation cue.

Research evidence

There are only a few published articles that have evaluated the effectiveness of the SMT program. Most of the evidence reported by Smith and his associates consists primarily of case studies or group studies that lack the necessary control groups (e.g., Smith and Smoll, 1978). There are two controlled investigations, however, that provide encouraging results concerning the efficacy of SMT (Nye, 1979; Ziegler et al., 1982).

Nye (1979), using test anxious university students, compared an earlier version of the SMT program to Meichenbaum's (1972) covert stress inoculation procedure, plus two

control groups. Nye (1979) reported that the SMT group showed the greatest decrease in scores in Sarason's (1978) test anxiety scale. Both SMT and the covert rehearsal group recorded the largest decrease in state anxiety in actual tests. These two stress management groups also showed significant increases in general self-efficacy compared to the control groups.

Ziegler et al. (1982), using cross country runners, compared the effectiveness of the SMT program to Meichenbaum's (1977) stress inoculation procedure plus a control group over a five week training program. Nine subjects were matched on the basis of submaximal oxygen consumption and divided into three groups. Subjects in the SMT group learned relaxation and cognitive coping strategies. These coping skills were "applied to a series of disasterious track imagery scenes" (p.283). The athletes used the coping skills to control their emotional responses to the imagery. Employing the physiological measures of oxygen consumption and heart rate as dependent measures, Ziegler et al. (1982) reported significant increases in oxygen consumption at submaximal running rates in both treatment groups compared to the control group. Ziegler et al. (1982) did not report any affective or cognitive measures.

Although the above two studies do provide some evidence about the efficacy of SMT, further studies are needed to assess SMT in developing effective coping responses in athletic situations. Ziegler et al. (1982) did not evaluate whether subjects were acquiring the coping skills and then applying these skills in athletic setting. Meichenbaum (1977) suggested that it is necessary to measure affective, cognitve, and behavioral indices in evaluating the efficacy of a treatment program. At the present moment, there are no published controlled outcome studies that have carefully evaluated the efficacy of SMT in an athletic setting.

Summary

The reviewed literature provides overwhelming evidence regarding the importance and means of controlling dysfunctional emotional experience and behavior. Distress in athletic situations has been shown to disrupt performance, reduced athletic enjoyment, lead to dropping out, injury, and uncontrolled sports aggression. Cognitive theories of emotion hold that the lack of emotional control is due to a complex transaction between cognitive appraisal, environmental factors, and coping skills (Lazarus and Folkman, 1984; Weiner, 1985). The conceptualization of stress which best accounts for environmental-person relationships is the transactional approach (Lazarus and Folkman, 1984).

Smith's (1980) Cognitive-affective Stress Mangement Training program provides a sound framework to help athletes acquire, rehearse, and apply an integrated coping response having cognitive and behavioral components, to help ameliorate potentially stressful situations. Smith's program is founded on the theoretical tenets of the cognitive-arousal theories of emotion (i.e., Lazarus, 1966; Schachter, 1974) and the transactional view of the stress process. The components of the SMT program are based upon well established viewpoints of cognitive restructuring (e.g., Beck, 1976; Ellis, 1977), relaxation (e.g., Jacobson, 1929), self-instructional training (e.g., Meichenbaum, 1977), and induced affect (e.g., Sipprelle, 1967). Cognitive-affective Stress Management Training also represents a logical step in the development in intervention programs.

The SMT framework is still relatively unproven as an intervention program in athletic settings, although it has been advocated in several undergraduate sport psychology textbooks (e.g., Cox, 1985; Gill, 1986). The large bulk of supporting evidence for SMT efficacy was gathered through case studies or uncontrolled outcome studies. This study represents a controlled quasi-experimental study (Cook and Campbell, 1977) which attempted to

investigated changes in three primary components (affect, cognition, and performance) after volleyball players completed the SMT program.

G) Hypotheses

Based on the literature review, the following hypotheses have been generated for the study.

Primary Hypotheses

1. That the treatment group will have significantly lower self-reported competitive trait anxiety (SCAT) compared to the control group.
2. That the treatment group will have significantly lower self-reported competitive state anxiety (CSAI-II subscales of cognitive and somatic anxiety) compared to the control group.
3. That since SMT teaches coping skills which allow players to manage situations that may have been previously unmanageable, the treatment group will have higher general self-efficacy compared to the control group.
4. That since SMT attempts to modify the self-statements that mediate stress, the treatment group should increase positive self-statements and decrease negative self-statements in response to video-taped volleyball stressors compared to the control group.
5. That since SMT teaches athletes to develop skills to control distress, which has been associated with performance decrements, the treatment group will have higher performance on service reception in a controlled practice compared to the control group.

Secondary Hypotheses

1. That competitive trait anxiety (SCAT) will be significantly correlated with the CSAI-II subscales of cognitive and somatic anxiety.
2. That there will be a moderate positive correlation between the CSAI-II subscales of

cognitive and somatic anxiety.

3. That there will be a negative correlation between the two CSAI-II subscales of cognitive and somatic anxiety and the subscale of self-confidence.
4. That there will be a negative linear relationship between performance and the CSAI-II subscale of cognitive anxiety.
5. That there will be a curvilinear relationship between performance and the CSAI-II subscale of somatic anxiety.
6. That there will be a positive linear relationship between performance and the CSAI-II subscale of self-confidence.

CHAPTER 3

Method

Subjects

Thirty-two volleyball players, 16 men and 16 women, selected for the 1987 Alberta Canada Games Team (under 19) participated in the study. These players were classified as the top eligible players in their age class. The players were selected for the team after a series of regional training camps by Provincial Staff coaches. All players were required to participate in the study as part of the provincial team training program.

The players within each team were assigned on the basis of geographic location, with the restriction of a maximum of eight players per group, to one of two conditions; treatment or control. Since players came from most regions of the province, it was logistically impossible to randomly assign team players to each group and then conduct the treatment sessions.

Subjects were deleted from the study as soon as one of the following criteria was met; being absent from three or more training sessions, leaving the Provincial team, or being dropped from the Provincial team. The final numbers for each group were: Control-men = six, Control-women = five, Experimental-men = eight, Experimental-women = eight. One control subject from each team were loss to the Junior National Team, two were lost because of injury, and one player quit the female team.

Design

The players were assigned to one of two conditions: Cognitive- affective Stress Management Training (SMT), or control (Con). The independent variables were type of treatment (SMT or Con), gender (male or female), and time of assessment (pretreatment, posttreatment, and follow-up). The dependent measures were, 1) sport competitive trait anxiety, 2) state cognitive anxiety, state somatic anxiety, and state self-confidence taken just

before controlled practice performance, 3) a self-rating of general self-efficacy, 4) positive and negative thoughts in response to two video-taped volleyball-specific stressors, 5) evaluation of volleyball service reception in a controlled practice. Each athlete also filled in a pretreatment ancillary questionaire inquiring about previous high level playing experience, rating of ability, sources and effects of stress, and modes of coping. All treatment subjects also completed a follow-up written evaluation of the treatment program.

A separate evaluation was also held about three weeks posttreatment at the National Challenge Cup, a competition involving most of the Canada Games teams. Dependent measures evaluated were: 1) pregame state cognitive and somatic anxiety, and state self-confidence, and 2) service reception performance. It should be noted, however, that all players received different amounts of playing time. Furthermore, only eleven players from each squad played at the National Challenge Cup. The analysis was separated by gender. The designs were treatment (2) by games (5) with repeated measures on last factor.

Measures of sport competitive trait anxiety, self-efficacy, thoughts, state cognitive and somatic anxiety, self-confidence, and controlled practice performance were collected for all subjects at pretreatment and posttreatment. Only treatment subjects completed the follow-up assessment because four male controls started some form of psychological enhancement programs as part of their University of college program (about 8-10 weeks posttreatment) and three female controls were unavailable due to University commitments. The first design was treatment (2) by gender (2) by assessment (2) with repeated measures on last factor. The design for the follow-up was gender (2) by assessment (3).

Measures

State Anxiety. Self-reported state anxiety was measured by the Competitive State Anxiety Inventory II (CSAI-II) (Martens, Burton, Vealy, Bump, and Smith, 1983). CSAI-II is a psychological measure developed specifically for competitive sport. The

CSAI-II contains three subscales: cognitive anxiety (CSAI -cog), somatic anxiety (CSAI-som), and self-confidence (CSAI-sc). Cognitive anxiety is defined as conscious awareness of [illegible]nt feelings about oneself or external stimuli, worry, and disturbing visual images. Somatic anxiety refers to psychological or affective elements of the anxiety experience which develop directly from autonomic arousal (Martens et al., 1983).

Martens et al. reported a number of studies that examined the reliability, concurrent and construct validity of CSAI-II. Internal consistency, which measures the degree to which items in the same subscale are homogeneous, showed coefficients ranging from r=.79 to .90. Concurrent validity was assessed by comparing CSAI-II to a number of trait and state anxiety inventories. The results indicated respectable concurrent validity. For example, the correlation of SCAT (Martens, 1977) with the subscales of CSAI-II were r=.45 (CSAI-cog), r=.62 (CSAI-som), and r=-.55 (CSAI-sc). The subscales of CSAI-II correlated in a consistent fashion with the corresponding subscale of the Worry-Emotionality Inventory (Morris, Davis, and Hutchings, 1981). The correlation between WEI-worry and CSAI-II subscales were r=.74 (CSAI-cog), r=.37 (CSAI-som), and r=-.62 (CSAI-sc). The correlations with WEI-emotionality were r=.57 (CSAI-cog), r=.82 (CSAI-som), and r=-.40 (CSAI-sc). The evidence for independence of the subscales were mixed. Correlations varied from r=.31 to .60, indicating that there is some interdependence between subscales.

The Form E of the CSAI-II consists of 27 items to be ranked on a four point scale:

1. Not at all
2. Somewhat
3. Moderately so
4. very much so

The cognitive anxiety subscale is scored by totalling the responses for nine items: 1, 4, 7, 10, 13, 16, 19, 22, 25. The somatic subscale is scored by totalling the responses for

questions 2, 5, 8, 11, 14R, 17, 20, 23, 26 (item 14 must be reversed). The self-confidence subscale is scored by totalling responses for items: 3, 6, 9, 12, 15, 18, 21, 24, 27. The range of scores on each subscale is from 9 to 36. The CSAI-II is shown in Appendix B.

Trait Anxiety. Self-reported trait anxiety scores was measured by the Sport Competitive Anxiety Test (SCAT) (Martens, 1977). SCAT is a psychological measure developed specifically for sport. Martens (1977) argued that SCAT is a superior predictor of state anxiety when compared with general trait anxiety inventories such as the Taylor Manifest Anxiety Scale (Taylor, 1953) or the State-Trait Anxiety Inventory (Speilberger, 1972). For example. Martens and Simon (1976) found that SCAT predicted pregame A-State scores better (r=.64) compared to Speilberger's (1972) STAI A-Trait (r=.30).

The Form A SCAT scale consists of 15 self-descriptive statements to be ranked on a three-point scale:

A. Hardly ever

B. Sometimes

C. Often

Ten of the questions are test items (questions 2, 3, 5, 6, 8, 9, 11, 12, 14, 15) and the other five questions are spurious items (1, 4, 7, 10, 13). Questions 2, 3, 5, 8, 9, 12, 14, 15 are scored according to the following key:

1= hardly ever

2= sometimes

3= often

Questions 6 and 11 are scored to the following key:

1= often

2= sometimes

3= hardly ever

The range of scores on the SCAT is from 10 to 30. The SCAT is shown in Appendix C.

Self-Efficacy: Self-reported general self-efficacy was measured by Coppel's (1980) Self Efficacy Scale (SES), which was developed on the basis of Bandura's (1977) conceptualization of self-efficacy. Based on a study with university undergraduates, Coppel's SES demonstrated high internal consistency (coefficient=.91). Test-retest reliability over two weeks revealed a reliability coefficient of r=.86. Coppel found that correlations with other measures were in the predicted direction. Higher self-efficacy individuals had better psychological adjustments, were in better health, had greater social contacts, and were more internal in their locus of control.

Coppel's SES is composed of 22 self-descriptive statements which are rated on a five point scale:

1= not at all like me

2= a little like me

3= somewhat like me

4= fairly much like me

5= very much like me

Items 4, 6, 12, 13, and 22 are scored in a reversed order. Scores on the SES range from 22 to 110. The SES is shown in appendix E.

Thought-listing Athlete's thoughts in response to a stressors were measured by means of a thought listing procedure described by Cacioppo and Petty (1981) and adapted by Long (1984). The thought listing procedure used in this study involved having the athletes list their thoughts after viewing each of the two video-taped volleyball situations. One situation involves a player serving the ball into the net during an important game, while the second situation involves a player badly misplaying a serve for match point. Players were asked to imagine themselves in the players position. The two reactive situations were part of a total of five video-taped scenes (see appendix D). The three spurious scenes were changed in each assessment period.

The time period used in the thought-listing has ranged from 45 to more than ten minutes (Cacioppo & Petty, 1981), but the most common time period is in the range from two to three minutes. Cacioppo and Petty (1981) suggested that the shorter time period allows only the most salient thoughts to be recored. The present study used a time period of two and one-half minutes.

The thoughts listed by the athletes were evaluated by two judges for scoring into the three categories of positive thoughts, negative thoughts, and neutral/irrelevant thoughts. Positive thoughts are statements that are favourable or supportive, indicate preparatory self-talk, or positive reappraisal of a situation. Negative thoughts are unfavourable thoughts towards or in opposition to the situation that reflect reactionary verbalization (swearing), self-condeming, self-defeating thoughts. Neutral thoughts are statements that are neither supportive or unfavourable or are irrelevant to the situation. Scores for the the judges's ratings were computed by calculating the proportion of positive and negative thoughts to total thoughts. The judges were the primary investigator and another experienced volleyball coach who was unaware of group assignment and experimental hypotheses.

The directions to the athletes are adapted from instructions described by Petty and Cacioppo (1979):

> We are interested in what you are thinking about during the presentation on the tape. You are to image yourself in the position of the player in the situation. You should try to record only those ideas you are thinking during the presentation. Please state your thoughts and ideas as consisely as possible....a phrase is sufficient.
> IGNORE SPELLING, GRAMMAR, AND PUNCTUATION.
> You will have 2 1/2 minutes to write your thoughts. Please be completely honest and record all of the thoughts that you had.

Performance. Volleyball service reception performance was video-taped and evaluated by the experimenter and an experienced volleyball coach. The coach was unaware of group assignment. Performance was assessed on a five point scale ranging from 1 (poor) to 5 (excellent). The following performance criteria was developed at the 1983 World University Games (Baudin, 1986).

1. POOR. Results directly in a point for the opposition (Ball directly hits the floor or is shanked out of play).
2. FAIR. Offensive play cannot be run and offense is limited to a high ball attack (may or may not be set by the setter).
3. AVERAGE. Setter is forced to play the ball from such a position that only one option of the attack is possible.
4. GOOD. Pass causes the setter to move but is still good enough to allow most options of the called offensive play.
5. EXCELLENT. Pass is perfectly passed to the setter at the correct height and distance from the net that will allow the use of all options of the called offensive play.

Ancillary questions. A number of additional questions were collected for descriptive purposes. The players were asked a series of questions concerning volleyball experience and ability, types of upsetting volleyball situations, influence of stress on performance, and preferred methods of coping with stress (See Appendix F).

Program evaluation questionnaire. After the completion of the program the treatment players were sent a questionnaire consisting of eleven questions constructed to probe individual player's perception of the program. The questions addressed the SMT program's effectiveness, preferred coping strategies, compliance, and other related questions (see Appendix G)

Procedure

The players were assigned to one of two condition (experimental or control). Before any tests were administered, all subjects were told that the information was being gathered on their feelings about competing, thoughts about different volleyball situations, and volleyball performance. They were informed that the information would be used to evaluate volleyball players approaches to handling stress. It was emphasized that their responses were strictly confidential.

Before the treatment prgram began, a data acquisition session involving all the players was held.Players first filled out the ancillary questionnaire form. Players then filled out the SCAT and the Self-efficacy scale. The thought-listing procedure was then completed. During the thought-listing procedure, the players read the instructions and were then instructed to read the first context. The players were encouraged to imagine themselves in that context. After about a minute the video machine was turn on until the scene was completed. The players were instructed to write their thoughts. After the time frame of two and one-half minutes had past, the players were instructed to read the next context. The procedure continued until all scenes had been completed. The assessment finished with CSAI-II and service reception being the last measures evaluated. Players were allowed to warm-up for fifteen minutes before performance was assessed. Just before service reception, each player filled out the CSAI-II. A member of the coaching staff served twelve times to each player,

who was located in position number five on the court. The first two serves were considered warm-up. The player attempted to pass the ball to the setter in the standard position (between positions two & three).

The SMT program was structured into eight modules, with each module lasting approximately one hour. The active treatment was administered by the investigator. The SMT group was trained according the guidelines proposed by Smith (1980a, 1980b) and Smith and Ascough (1985). The present program was unique since there appeared to be no published investigations of the SMT program using volleyball players. The purpose of the SMT program is to have players acquire the "intergrated coping response". The players learned relaxation skills, monitoring and challenging irrational beliefs, replacing irrational and stress-elicting self-statements with stress reducing self-statements, and developing skill-specfic self talk. The players rehearsed these skills under high-arousal "induced affect" imaginal conditions, and finally used the intergrated coping response in practice and game situations. Players received homework assignments which were reviewed in each session. A summary of each module is attached in appendix A.

Since there were players from each condition on each team, there was a chance of contamination. To help avoid this problem, all players were instructed not to discuss the contents or procedures of the training sessions with players outside of their group or with the coaches. The problem of experimental contamination is also reduced due to one of the primary assumptions of the coping skills training model; that is, knowledge of coping skills is a necessary but not sufficient condition to control stress. The player must systematically practice the coping skills to effectively utilize the skills in managing stress.

Approximately one week following the last treatment session, posttreatment assesment involving all players was held. The procedures involved in these sessions were identical to the pretreatment data collection session with exception that the ancillary questionnaire was

not included.

During the National Challenge Cup, which was approximately three weeks posttreatment, the investigator collected CSAI-II scores about five to ten minutes before each match. Each match was also video-taped for performance analysis.

Approximately six months posttreatment, a follow-up assessment was undertaken. The assessment procedure was similar to the pretreatment and posttreatment testing situations. The two exception were that no control players were assessed and service reception performance was assessed on a separate day due to volleyball court booking problems.

Each player involved in the SMT program was sent a program evaluation questionnaire. The questionnaire was mailed two months posttreatment, with follow-up letters and extra questionnaires mailed four months and six months posttreatment.

CHAPTER 4

Results

Data Analysis

The major concern in the analysis of the data is to adequately describe and evaluate the treatment effects to allow valid inference from the sample. Stevens (1986) argued that when group size is small ($n < 20$), it is important to be aware of Type II error. Stevens recommends the use of a liberal significance level with small groups sizes ($p < .10$ or .15) to increase power. Although there is a greater risk of Type I error, it is balanced by the increase in power. In evaluating the efficacy of the SMT treatment in this study, we are faced with the problem of power. The inherent small group sizes creates the potential for Type II error if a conservative significance level is chosen. Clearly, in this study the costs of accepting the null hypothesis are far greater than the costs of rejecting the null hypothesis. This study is basically an exploratory controlled study designed to assess the efficacy of SMT. Therefore, to increase statistical power, a liberal significance level of $p < .1$ was chosen to evaluate main effects and higher order interactions.

The data for each evaluation phase (pretreatment/posttreatment; National Challenge Cup; Follow-up) were analyzed by one of two major inferential statistical techniques: analysis of covariance (ANCOVA) or analysis of variance with repeated measures (ANOVA). The purpose of using ANCOVA is to increase power by removing predictable variance from the error term. ANCOVA statistically adjusts for individual differences (Stevens, 1986). There are two critical limitations connected to the valid application of ANCOVA. First, there must be a significant relationship between the dependent variable and the covariate (Huiteman, 1980). Lack of linearity reduces power by underestimating error reduction. Second, there must not be a dependent relationship between the covariate and the treatment variables. This

homogeneity of regression is based upon the fact that adjustment of observation scores in ANCOVA is made on the basis of an average within cell regression coefficient (Tabachnick & Fidell, 1983). An interaction between the treatment and covariates violates the homogeneity of regression slopes and violates ANCOVA statistically (Stevens, 1986).

Repeated measures analysis removes variability among the subjects due to individual differences completely from the error term (Stevens, 1986). It makes the analysis more powerful than between group ANOVA without the linearity and homogeneity of regression slope assumptions required in ANCOVA. However, it is not as powerful as ANCOVA.

The post-hoc multiple comparison test selected was the Scheffe method. Although Scheffe is more conservative then Tukey HSD with equal group sample sizes, it is recommended for unequal sample sizes such as exists in the present analysis (Hinkle, Wiersma, and Jurs, 1979). The Scheffe method also allows the testing of complex comparisons, such as testing whether follow-up and posttreatment differ significantly from pretreatment. It has been recommended by Kirk (1982) to use a modified mean square error term for between group analysis (e.g., males vs. female at each assessment time) that is a pooled error term of within and between mean square error terms. The use of a pooled error term is recommended because the sum of squares for gender (A) at each time (B) is composed of the sum of squares of B within A ($SS_{B(A)}$) and the sum of squares of AB within A ($SS_{AB(A)}$). Using the mean square within overinflates the resulting F ratio score while the use of mean square between is too conservative.

Coding of thought-listing and performance data.

The performance and though-listing data needed to be coded before any data analysis was possible. Using the criteria listed in the measures section, the data was coded by the

investigator and an experienced volleyball coach who was naive about group selection and players. For service reception performance, all of the performances were viewed by both coders and separately scored. At the end of each player's performance, recorded scores were compared. Of the 520 service receptions at pretreatment and posttreatment, the coders initially agreed on 453 (87%). Because of the high agreement, the primary investigator's coding scores were used in the data analysis.

The thought-listing sheets were also coded separately by each coder. The coders agreed initially on 82% of the thoughts. After comparing coding sheets, most differences were resolved through discussion. Any unresolved differences (3%) were recorded as neutral thoughts. Most unresolved differences concerned the differences between positive and neutral thoughts.

Preview

A total of 27 subjects were available to be evaluated in this study. Due to treatment assignment, final team selection, and the nature of the analysis in the separate evaluation phases of the study, actual sample sizes used in each analysis varied. To aid in the evaluation of the study, each of the three evaluation settings will be described separately.

A) PRETREATMENT AND POSTTREATMENT DATA.

Descriptive statistics.

The mean and standard deviations of all dependent variables at pretreatment and posttreatment are reported in Tables one, two, and three. It was possible to compare the means of several variables to previously published norm or sample means.

The values for SCAT at pretreatment and posttreatment (see Table 1) were four to six points lower than norms for grade 10 to 12 females reported by Martens (1977). These scores indicate that the youth volleyball players had lower trait anxiety compared to typical male and female in this age range. These scores are also much lower compared to values for highschool female volleyball players (i.e., SCAT = 23.7 - 25.2) reported by Lanning and Hisanaga (1983).

Reported scores for cognitive and somatic CSAI-2 subscales (see Table 1) were slightly higher, while self-confidence scores were about the same as values reported for team sports by Martens et al. (1983). It is difficult to compare a highly unstable, dynamic construct across studies because numerous situational and personal factors affect state anxiety.

The general self-efficacy scores (see Table 3) were about two to six points higher than those reported for University undergraduates (Coppel, 1980), and several points higher then scores reported at pretreatment for a general population by Long (1980). This suggests that the high performance players had a good general self-confidence in their ablilities.

The percentage of positive and negative thoughts clearly indicated, at least at pretreatment, that the players perceived the video-taped scenes to be stressful. Almost 40 percent of the athletes' thoughts were classified as negative for scene one, with the percentage jumping to nearly 74 percent for scene two (see Table 2). This was an important finding because in order to assess changes in treatment players' thoughts, it was necessary to have potentially stressful situations. Indeed, the percentage of negative thoughts in scene two was slightly higher than those reported by Long (1980) who had subjects record thoughts they had experienced during a recent stressful situation.

The performance scores indicated that the group mean at pretreatment was slightly below average; that is, the setter was forced to play the ball from such a position that only one

option of the attack was possible (see Table 3). The posttreatment group mean increased to slightly above average. It apparent from the variance that there were large individual differences, especially at posttreatment. Again, pretreatment scores were important because it clearly indicated that performance increases were not negated by ceiling effects.

A correlation matrix for all dependent variables, separated by assessment time, are shown in tables four and five. The affective measures (SCAT & CSAI-II subscales) within each assessment time (pretreatment and posttreatment) were significantly correlated, indicating these dependent variables were significantly related. As expected, SCAT was related positively to CSAI-cog and CSAI-som and related negatively to CSAI-sc. The slightly higher correlation between SCAT and CSAI-som is consistent with findings reported by Martens et al. (1983). The correlation coefficients between SCAT and CSAI-cog are about .15 to .20 points higher than those reported by Martens et al. (1983).

The correlation coefficients among the CSAI-II subscales were significant. CSAI-cog and CSAI-som were positively related while CSAI-cog and CSAI-som were both related negatively to CSAI-sc. The correlation coefficients between CSAI-cog and CSAI-som ranged from r=+.72 to r=+.48 (pretreatment and posttreatment, respectively) indicating a strong inter-relationship between the two anxiety measures. The CSAI-cog subscale was more highly related to CSAI-sc than CSAI-som.

None of the affective measures significantly correlated with service reception performance. The lack of significance does not support the secondary hypothesis concerning significant linear relationships between anxiety scales and performance. These results are consistent with findings by Martens (1977) and Martens et al. (1983) that SCAT and CSAI-II are not significant linear predictors of performance. There is a possibility that the CSAI anxiety scales may be related in a nonlinear manner to performance. Visual inspection

of the performance-anxiety relationships showed in figures three, four and five does not reveal any discernable relationship.

Inferential Analysis

Data for each dependent measure was originally analyzed by a two-way analysis of covariance (ANCOVA) with pretreatment data as the covariate. The results of the ANCOVA for each dependent measure are shown in Table six. For dependent measures which were significant at $p<.1$, two dependent measures, positive thoughts to scene one and service reception performance, violated critical assumptions of ANCOVA. These two measures were analyzed by a 2 (treatments) X 2 (gender) X 2 (pretreatment and posttreatment) analysis of variance with repeated measures on the last factor. Table seven shows a breakdown of the analysis of covariance for variables that did not violate assumptions. The repeated measures ANOVA for positive thoughts to scene one and service reception performance are displayed in Table eight.

SCAT

It was hypothesized that treatment subject should decrease their SCAT scores over the course of the program. Analysis of covariance revealed a significant treatment by gender interaction ($F=3.13$, $p<.09$), but both the treatment and gender main effects failed to reach significance ($F=.38$, $p<.5$; $F=.48$, $p>.4$, respectively). An examination of adjusted means, shown in Figure six, indicates that the source of the interaction may be the higher male control score ($x=18.13$). Post-hoc analysis, using Scheffe, indicated a significant difference between treatment males and control males ($F=2.99$). It is clear that the SMT

treatment did not significantly reduced SCAT scores. Therefore, the hypothesis was not supported.

CSAI-II

It was hypothesized that players trained in SMT should have lower cognitive and somatic anxiety before evaluative performance conditions compared to control players. For CSAI-II cognitive anxiety, ANCOVA revealed that all main effects and interactions failed to reach significance. Similar findings were found for CSAI-II somatic anxiety (see Table 7). Adjusted means for CSAI-cog and CSAI-som are shown in figures seven and eight, respectively. Again, the hypothesis that subjects in the SMT treatment would have lower anxiety compared to the control group was not supported.

A third subscale of CSAI-II is self-confidence. ANCOVA indicated that all effects failed to reach significance (see Table 7). Adjusted means are shown in Figure nine. It is evident that the treatment group did not have significantly higher self-confidence before service reception performance compared to the control group .

It was surprising that the SMT program was not effective in reducing somatic and cognitive anxiety, since a major portion of the program is directed towards anxiety management. A careful analysis of the players anxiety scores at pretreatment may provide some clues as to the reason for a lack of differential effect (see Table 1). The cognitive and somatic anxiety scores can range from nine to thirty-six. The average group scores ranged from 13.1 to 20.0 for cognitive anxiety and from 12.1 to 18.3 for somatic anxiety. After correcting for individual differences, the adjusted group means at posttreatment range from 14.5 to 15.6 for cognitive anxiety and 12.4 to 13.9 for somatic anxiety. These adjusted scores are only 3 to 6 points above the minimum floor score.

The low anxiety scores could be due to two possible interrelated reasons. The subjects within each condition, on the average, already possessed good anxiety management skills or that the evaluative service reception setting was not perceived to be very threatening. The lack of potential psychological threat would not allow the SMT subjects to apply their coping skills because these skills were not required.

THOUGHT-LISTING.

It was hypothesized that subjects in the SMT program would change the type of thoughts emitted in response to two video-taped volleyball stressors. Specifically, it was hypothesized that treatment players would have more positive thoughts and fewer negative thoughts compared to the controls.

a) **Positive thoughts to scene 1.**

Analysis of covariance revealed that all main effects and interactions failed to reach significance (see Table 7). Adjusted means are shown in figure 10. From viewing figure 10, there appears to be a treatment by gender interaction. However the interaction was not significant ($F=1.92$, $p>.17$). Large within cell error and small sample size contributed to the lack of an interaction effect. From viewing the percentage of positive thoughts it was apparent that most subjects did not find the first scene extremely stressful. Approximately 40% to 50% of the thoughts were classified as positive.

b) **Negative thoughts to scene 1.**

Analysis of covariance revealed significant main effects of treatment ($F=4.04$, $p<.06$) and gender ($F=5.44$, $p<.03$). The treatment by gender interaction failed to reach significance ($F=2.52$, $p>.12$). Adjusted means are displayed in figure 11. The apparent interaction was not statistically significant due to large within cell error. The adjusted means

collapsed across treatments were 31.4% for treatment and 46.2% for controls. The adjusted means collapsed across gender were 30.5% and 47.5% for females and males, respectively. The results supported the hypothesis that the SMT groups should have significantly fewer negative thoughts compared to the controls. The gender effects indicated that females had fewer negative thoughts compared to men.

c) Positive thoughts to scene 2.

A repeated measures analysis outputs both beween-subject and within-subject effects. Between-subject results revealed a significant treatment effect ($F=4.4$, $p<.05$). All other effects were not significant. The between-subject effect only informs us that the treatment group was different from the control group over both pretreatment and posttreatment. All within-subject effects failed to reach significance (see Table 8). Observed cell means are shown in figure 12. The critical analysis of a treatment by testing times interaction ($F=1.64$, $p>.2$) failed to support the hypothesis that the SMT group would have a significantly higher percentage of positive thoughts to a stressor compared to the control group.

d) Negative thoughts to scene 2.

Analysis of covariance revealed that there was a significant treatment effect ($F=6.97$, $p<.02$). All other effects failed to reach significance. Adjusted means, shown in figure 13, clearly indicated that players in the SMT condition had significantly fewer negative thoughts in response to the stressor compared to the control group. Adjusted means collapsed across gender were 77.6% for controls and 55.3% for SMT. These results support the hypothesis that SMT subjects would have significantly fewer negative thoughts in response to a stressor compared to the controls.

SELF-EFFICACY

It was hypothesized that subjects in the SMT condition would increase their general self-efficacy compared to controls. ANCOVA revealed that all effects failed to reach significance (see Table 7). Adjusted means are shown in figure 14. The hypothesis is clearly not supported.

PERFORMANCE.

It was hypothesized that SMT players would show significant performance increases compared to the controls. Repeated measures analysis revealed a significant treatment by times interaction ($F=17.36$, $p<.001$). There were also significant within-subject effects for time ($F=39.82$, $p<.001$) and between-subjects effect for gender ($F=6.31$, $p<.02$). Other between subject effects failed to reach significance (see Table 8). Group means are shown in Figure 15. The treatment by time interaction is due to the treatment groups performing significantly better than the controls at posttreatment. Collapsing across conditions, the group mean for the treatment group at pretreatment was 26.5 compared to the control score of 28.8. However at posttreatment the treatment group improved 10 points to 36.3 while the controls improved to only 30.8. This conclusion was supported by Post-hoc analysis of simple pair-wise comparisons. The Scheffe method indicated a significant difference between pretreatment and posttreatment scores for the treatment group ($F=67.6$, $p<.001$). There was no significant difference between control group scores. Between group analysis, using pooled mean square error (Kirk, 1982), revealed no difference between groups at pretreatment but there was a significant difference ($F=8.18$, $p<.01$) at posttreatment.

The between subject gender effect was produced by the superior performance of the women. Cell means collapsed across treatments and testing times were 32.6 for women and

28.4 for men. These findings must be treated with caution however, since the performance conditions are not equivalent. The teams received service from coaches from their respective teams. There are also differences in the height of the net and height of the setter between teams. Nevertheless, the performance data strongly supports the hypothesis that service reception performance by the SMT players would be superior compared to the controls.

B) FOLLOW-UP DATA.

The purpose of the follow-up analysis was to evaluate the durability of the SMT program. Problems with obtaining a uncontaminated control group of sufficient size resulted in having only the treatment group available for analysis. This follow-up analysis, without a control group, presents problems in terms of validity. The factor of maturity produces a confound, since changes over time independent of the treatment are uncontrolled. Therefore, any changes between gender or within time in any of the dependent measures may have been produced by unobservable and uncontrollable factors.

Although the lack of a control group at follow-up does create some validity problems, the analysis does allow the examination of possible deterioration of treatment effects that were present at posttreatment. A major question of any intervention program must be whether the program effects will persist over time once the trainer-directed intervention is withdrawn. If players are still complying with the program, significant changes that occured from pretreatment to posttreatment should still be evident at follow-up.

The follow-up data was analyzed by a two (gender) by three (time) ANOVA with repeated measures on the time factor. A summary of the ANOVA for each variable is shown in Tables 9 and 10. Cell means and standard deviations for affective measures (SCAT and CSAI-II subscales), thought-listing, and performance plus self-efficacy are shown on Tables

11, 12, 13, respectively.

SCAT

Repeated measures ANOVA revealed a significant gender by times interaction ($F=2.45$, $p<.10$). The lower-order effects of gender and times were not significant. An examination of cell means (see Table 11) seems to indicate that the interaction is occuring between posttreatment and follow-up. Post-hoc analysis to test simple mean differences using Scheffe indicated there was no significant differences between each pair of means within (times) or between (gender). Only a complex contrast, which compared the means of the pretreatment plus posttreatment minus follow-up between sexes indicated a significant difference ($F=4.01$). This contrast is represented as:

Males +1 +1 -1

Females -1 -1 +1

The possible reasons for this interaction are unknown. The cross-over in scores at follow-up from posttreatment are small (1.5 to 1.6) and may reflect measurement error. The lack of a control group further clouds any meaningful interpretation of this finding. The scores are also possibly contaminated by one outlyer in the female group who's SCAT score went from 14 to 23 to 15 over the three sessions. This extreme range fluctuation challenges the validity of the SCAT analysis.

CSAI-II

The original analysis at posttreatment did not reveal any significant treatment or gender differences. A careful analysis of group means over the three assessment times (see Table 11) indicated significant changes in group means over time in each of the CSAI-II subscales.

Each of the groups will be discussed separately.

a) Cognitive Anxiety (CSAI-cog).

The ANOVA revealed a significant gender by times interaction effect ($F=4.55$, $p<.02$), a significant gender effect ($F=3.85$, $p<.08$), and a significant times effect ($F=7.15$, $p<.004$). Examining group means (see Table 11), it seems apparent that the source of interaction was due to female subjects decreasing their cognitive anxiety scores over time, with the males remaining fairly constant. This conclusion was partially supported by post-hoc analysis of group means which indicated significant differences between pretreatment and follow-up ($F=23.1$), and between posttreatment and follow-up ($F=11.9$). There were also significant differences between male and females at pretreatment and posttreatment but not at follow-up. This finding indicated that males had significantly lower cognitive anxiety scores compared to females at both pretreatment and posttreatment.

b) Somatic Anxiety (CSAI-som)

The ANOVA revealed a significant gender by times interaction effect ($F=3.66$, $p<.04$), and significant gender ($F=3.38$, $p<.09$) and times ($F=4.66$, $p<.02$) effects. The group means (see Table 11) show similar trends as found in cognitive anxiety. Post-hoc analysis found that there was a significant difference between pretreatment and follow-up scores for females ($F=18.22$). There was also a significant difference between males and females at pretreatment ($F=8.2$). All other simple pair-wise comparisions failed to reach significance at $p<.1$. These findings implied that the major source of the gender by times interaction occured between pretreatment and follow-up. It should be noted however, that there were no significant effects in the original pretreatment/posttreatment ANCOVA analysis (see Table 7).

c) Self-confidence (CSAI-sc)

The ANOVA revealed a significant gender by times interaction effect ($F=3.05$, $p<.07$),

a significant gender effect (F=4.61, p<.06) and a significant times effect (F=6.56, p<.006). Visual inspection of group means revealed that the females increased their CSAI-sc scores over time, with males SCAI-sc scores scores remaining fairly constant (see Table 11). The greatest increase occured from posttreatment to follow-up. This observation was supported by post-hoc analysis of pair-wise comparisons which showed significant differences between posttreatment and follow-up (F=9.13) and pretreatment and follow-up (F=17.68) for females. There were also significant between group gender differences at pretreatment (F=6.05) and posttreatment (F=6.05).

Summary of CSAI-II scores.

The results from all CSAI-II subscales generally supported the argument that the females were significantly reducing anxiety and increasing self-confidence over time compared to the males, from pretreatment to follow-up assessment. This observation was also support by the lack of effects in the pretreatment/posttreatment analysis (see Table 7). It must be emphasized, however, that the data be treated with caution. There are numerous situational and personal factors that affect state measures. The present analysis occured during a break during a low-key invitational tournament, about three weeks before the Canada Games tournament. The women's team for the Canada Games tournament had already been selected. The final men's team, however, had not been selected. This major difference may have significantly affected the woman's perception of the controlled practice. This reason for differences in the women's scores is only speculation. It does highlight, however, the difficulties of maintaining internal validity in a field study.

SELF-EFFICACY.

The hypothesis that treatment subjects would increase their general self-efficacy, as measured by Coppel's (1980) SES test, was not supported by ANCOVA at posttreatment. The repeated measures ANOVA at follow-up on self efficacy again revealed no significant main or interaction effects. Visual inspection of the group means showed that group means remained fairly constant over assessment times (see Table 13).

THOUGHT-LISTING.

a) Positive thoughts to scene 1.

The adjusted cell means at posttreatment had suggested a gender by treatment interaction, since the female treatment group had a larger adjusted percentage, of positive thoughts to scene 1. The ANCOVA, however ruled out a significant difference. Visual inspection of group means for all three assessment times clearly indicated differential effects of time between gender (see Table 12). This conclusion is supported by the significant gender by times interaction ($F=4.42$, $p<.02$). The main effect of time was also significant ($F=3.13$, $p<.06$).

The female SMT group increased their percentage of positive thoughts over each assessment time, while the male group changed only a few percentage points. This observation is supported by post- hoc analysis which revealed a significant difference between pretreatment and follow-up scores for females ($F=15.9$) and a significant between group gender difference at follow-up. The female scores at follow-up appear to be a stable continuation from posttreatment scores, although the follow-up is confounded by time. The interaction effect may provide evidence of differential treatment effects between gender, an issue that will be discussed later.

b) Negative thoughts to scene 1.

As would be expected from the strong correlation between negative and positive thoughts to scene 1, there was also a significant gender by times interaction ($F=4.96$, $p<.02$). All other main effects failed to reach significance at $p<.1$. As with the positive thoughts analysis, the source of the interaction appeared to be at posttreatment and follow-up (see Table 12). Post-hoc analysis of pair-wise differences revealed a significant difference between pretreatment and posttreatment ($F=9.8$) and pretreatment and follow-up ($F=9.6$) for the females. There was also a significant between gender difference at follow-up ($F=4.74$). All other pair-wise comparisons did not reach significance. These findings support the notion that differences between pretreatment and follow-up scores between gender contributed to the interaction. This argument is further supported by the lack of a gender by treatment interaction at posttreatment analysis (see Table 7), although there was a strong trend in that direction ($p<.13$).

c) Positive thoughts to scene 2.

The analysis at posttreatment had revealed that only the treatment effect was significant. Inspection of Table 12 would seem to indicated that there was a possible gender by times interaction as females slightly increase their percentage of positive thoughts and males slightly decreased. The ANOVA, however revealed only a significant main effect for gender ($F=7.07$, $p<.02$). The groups means collapsed across assessments were 11.36% for males and 26.3% for females. This finding again provided support for the argument of a gender difference in cognitive coping skills.

d) Negative thoughts to scene 2

Similar to the positive thoughts analysis, inspectations of Table 12 seemed to indicate a gender by times interaction. Again ANOVA revealed only a significant mean effect for

gender. (F=3.18, p<.10). The group means collapsed across assessment times were 71.5% for males and 55% for females. The lack of a gender by times interaction was due to large within cell variance.

Summary of thought-listing

The necessity of a control group in evaluating treatment effects was clearly demonstrated at follow-up. Posttreatment analysis, using ANCOVA, which included the control group revealed significant treatment effects for negative thoughts to scenes 1 and 2, (p<.05, and p<.02, respectively). The follow-up analysis, which did not include the control groups, did not reveal any significant times effects for the males. These findings would imply a lack of a treatment effect from baseline for the male group. The follow-up analysis is, of course, confounded by time. The different situations, different time pressures, especially those pressures due to team selection, school exams, and interpersonal relations, would all contribute to the athletes cognitive processes at the time of assessment. The absence of a control group makes it difficult to control for these temporal changes.

PERFORMANCE

The treatment groups both showed significant improvement compared to the controls at posttreatment analysis. Inspectation of group means (see Table 13) showed maintenance of posttreatment scores at follow-up. The ANOVA revealed a significant times effect (F=17.15, p<.001). Assessment time group means collapsed across sexes were 27.3, 36.5, and 36.7 for pretreatment, posttreatment, and follow-up, respectively. Post-hoc analysis of simple pair-wise comparison indicated that the pretreatment score was significantly different from both posttreatment (F=26.22) and follow-up (F=27.55). The gender difference evident at posttreatment continued to be present at follow-up. The ANOVA revealed a gender effect

($F=8.36$, $p<.02$). The gender groups means collapsed across time were 31.3 for males and 35.3 for females.

C) CHALLENGE CUP DATA.

The Alberta teams participated in a National Challenge Cup competition about two weeks posttreatment. An attempt was made to assess the effectiveness of the SMT program under these highly competitive conditions. The dependent measures of state cognitive and somatic anxiety, state self-confidence, and service reception performance was collected for each match. It quickly became apparent that the performance data would not allow any inferences about treatment hypothesies to be advanced due to several reasons. First, in several games involving the males, only one or two controls played any significant portion of the game. Second, due to the increased role specialization found in the higher competition levels, many players did not pass the ball more than four times per match whereas other players passed the ball over 20 times. Third, due to a faulty video-tape, some game analysis data was lost. All of these reasons reinforce the difficulty in evaluating intervention programs in natural competitive situations.

The CSAI-II subscales were originally analyzed with repeated measures ANCOVA with the pretreatment control practice CSAI-II scores as the covariate. It was believed that using pretreatment scores as a covariate would reduce the individual differences and increase statistical power. However, there were several violations of the assumptions of employing ANCOVA. Furthermore, the men and women were involved in separate competitions, rendering between gender analysis meaningless. Therefore two (treatment) by five (games)

ANOVAs with repeated measures on games factor were calculated for each team. The ANOVA outputs for male and female players are shown in Tables 14 and 15, respectively. All means and standard deviations for male and female players for each match are shown in Tables 16 and 17, respectively.

CSAI-II Analysis for males.

The repeated measures ANOVA for CSAI-cog revealed a significant treatment effect ($F=4.64$, $p<.06$). All other effects were not significant. Inspection of group means shows that control players had lower cognitive anxiety scores compared to treatment players. This finding is contrary to the hypothesis that SMT players would have lower state cognitive anxiety compared to controls.

The repeated measures ANOVA for CSAI-som indicated no significant differences between treatment and control groups. Again, this finding does not support the hypothesis that the treatment would have lower somatic state anxiety compared to controls.

The analysis of CSAI-sc revealed a significant games effect ($F=5.60$, $p<.001$), with all other effects not significant. A visual analysis of the group means suggests the source of the difference occurs at game four. Post-hoc analysis using Scheffe supports this claim as the game four score (33.73) was significantly different from games one (31.5), and two (30.8), and three (31.0). The reasons for the high self-confidence in game four are difficult to identify. One possiblity is that games two and three were against the number one-ranked team in the tournament. Again, the lack of a treatment effect does not support the hypothesis.

CSAI-II women.

It was hypothesized that the treatment players would have lower CSAI-II cognitive

anxiety scores compared to the controls. The ANOVA revealed no significant treatment effects. The games effect, however, was significant ($F=2.63$, $p<.05$). Post-hoc analysis of simple pair-wise comparisons showed only that cognitive anxiety for game one (18.5) was significantly higher than game five (15.2). The lack of treatment effects clearly does not support the hypothesis.

The somatic anxiety analysis indicated a significant treatment by games interaction ($F=2.90$, $p<.03$) and a significant games effect ($F=2.81$, $p<.11$). The data suggested that control subjects had lower somatic anxiety in games one and three, which was supported by post-hoc analysis. The reason for the interactions are unclear. Game one was against a relatively weak team whereas game three was against a strong team which the Alberta needed to defeat to reach the semi-finals. Again, the data are contrary to expected treatment effects.

All effects for the self-confidence scale failed to reach significance. The lack of treatment effects clearly does not support the hypothesis that treatment subjects should have higher self-confidence compared to the control subjects.

Correlation Matrix

To examine the relationship between the CSAI-II subscales, Pearson r linear correlations were calculated between the three subscales within each of the five games. The analysis were also separated by gender. The correlations between subscales for female players are summarized in Table 18. Consistent with the pretreatment and follow-up analysis, somatic and cognitive anxiety subscales are moderately ($r=.53$) to highly ($r=.77$) positively related. Both anxiety subscales are also moderately ($r=-.37$) to highly ($r=-.82$) negatively related to self-confidence.

The correlation scores for males, however, are qualitatively different from the females.

There does not appear to be any consistent linear relationship between cognitive and somatic anxiety subscales. Two correlations (Games 1 and 4) showed nonsignificant negative correlations, while the other three correlations were nonsignificant positive correlations (see Table 19). The correlations between the anxiety scores and self-confidence scores are nonsignificant in all cases except three. In game one, cognitive anxiety is positively related to self-confidence (r=.56) while somatic anxiety is negatively related (r=-.80). In game four, somatic anxiety is again negatively related to self-confidence (r=-.52).

Summary of Challenge Cup data.

The hypotheses that treatment subjects (SMT) would have lower cognitive and somatic state anxiety and higher self-confidence compared to controls was not supported by the analysis. Indeed, in several cases, the control groups had significantly lower anxiety scores. The analysis highlights the problems associated with the validity of anxiety measurement. First, it is difficult to analyze a state measure without an appropriate baseline measure to correct for the law of initial values (Everlyi & Rosenfeld, 1981). Unfortunately, the baseline CSAI-II scores were not correlated with the game data. Yet, to assume that all subjects have similar anxiety levels is not reasonable. Second, absolute anxiety levels are not the same as dysfunctional anxiety levels. The athletes were instructed to use SMT to manage, not eliminate, anxiety levels. At this stage of CSAI-II development, there is little consistent support for the construct validity of CSAI-II in predicting performance (Martens et al., 1983; Krane & Williams, 1987). Therefore, it can be concluded that absolute levels of anxiety are not a valid means to evaluate the effectiveness of SMT.

D) ANCILLARY QUESTIONS.

A series of questions were posed to the players regarding their years of competitive club experience, perceived ability relative to teammates, previous provincial team experience, perceived performance in important games, perceived performance interference caused by distress, and preferred modes of coping. None of the questions have been analyzed for reliability and validity. Therefore, the players' responses were analyzed by simple descriptive statistics. It was hoped that the responses would provide some insight into the complex and often subtle relationship which exists between personal factors and environmental factors not addressed through the other dependent measures. Any conclusions or inferences, however, must be treated with caution until such time that they may be measured by psychometrically sound instruments and analyzed in the appropriate fashion.

a) Competitive experience and previous provincial team representation.

All four groups, except the experimental female group, had over four years of competitive club volleyball experience (see Table 20). The experimental female group, however, had more years of previous provincial team representation than either of the two male groups but sightly less than the control female (see Table 20). The greater previous provincial team experience by the woman may reflect the lack of depth in woman's volleyball in Alberta. Every female player, except one, had played previously on a provincial team. This finding contrasts with six males who had never played previously for a provincial team.

b) Ranked ability.

The group means indicated inconsistencies across sexes and conditions in perceived ability compared to other provincial teammates (see table 20). The experimental males had the highest opinion of their ability, with three players perceiving themselves to be in the top 10%, while four others recorded rankings of top 30%. The experimental females, on the

other hand, were lowest in perceived ability, with a group mean slightly below middle 40%.

There appeared to be little relationship between players' perceived ability and coaches selection for the National Challenge Cup team and the starting line-ups. Three males who ranked themselves in the top 30% were not selected for the Challenge Cup team. One female, who ranked herself in the top 10%, was not a consistent starter. Another female, who ranked herself in the bottom 30%, often was the first substitute and occasionally a starter. This question may have, unfortunately, suffered from social desirability problems as many players wanted to put forth a confident image.

c) Performance in important matches.

There was very little difference between the groups in terms of how well they believed they performed in important matches. The control groups had slightly higher opinions of their performance compared to the experimental groups (see table 20). All groups, however, felt they played above average in important games.

d) How much stress negatively affects performance.

Again the group means (see table 20) revealed little difference between the groups, although the standard deviations imply there were some large individual differences within some groups. In general, the average degree of interference reported was approximately 20%. Only four players reported values over 30%. The reported findings are somewhat surprisingly low considering Smith and Smoll's (1982) finding that over 40% of a University football sample reported that stress greatly disrupted their performance. This reflects, in part, the problem of external validity (Cook & Campbell, 1979). It is often difficult in generalize across situations. The discrepancies between the present finding and those of Smith and Smoll (1978) probably reflect major differences in sports (volleyball versus football), age (under 19 versus 18 to 23), and sporting environment (Provincial

Juvenile Level versus Pac-10 American College Football). Furthermore, the term stress is very ambigious (Mason, 1975). Different players, especially before the experimental conceptualization phase, have different interpretations of its meaning.

e) Sources of stress.

The players were asked to record volleyball situations which angered or upset them and to list the intensity of the emotion on a one to ten scale with ten representing extremely upset. For the sake of clarity, responses were coded into seven categories; 1) Personal performance - individual technical or strategic error, 2) Personal attitude - not trying hard enough, not being prepared to play, or not being a good team player, 3) Team performance - teammates technical or strategic errors, 4) Team attitude - teammates not trying hard enough, teammates comments or social actions, 5) Coach- comments, decisions, or actions, 6) Referee- perceived poor decisions by the referee or linespersons, 7) Communication - poor communication during play by the team (see Table 21 for summary of responses).

Since there did not appear to be differences between control and experimental subjects, these groups were collapsed within gender. The reported sources of stress clearly indicated gender differences. In terms of frequency, females reported 3.25 personal performance situations per player, with all other situations under 0.25. Of the 48 sources reported, 39 were coded under personal performance while the next highest category was team attitude with only three situations reported. The males, in comparision, reported an average of 2.7 personal performance situations. Although other situations were all under one, 29 of a total of 73 responses centered on factors external to themselves.

The average intensity of the sources of stress are above five, indicating moderate intensity. The most intense stress category appears to be team attitude. This is not surprising if one considers Weiner's (1985) attribution-emotion framework. Team attitude can be

classified as a controllable, internal, and unstable factor ascribed to other persons. This attribution should produce anger in the abscriber (Weiner, 1985).

Means of coping with stress.

The players were asked an open-ended question regarding how they coped when under stress. Their responses were numerous and varied. An attempt was made to code these responses under strategies of coping often reported in the literaure (e.g. Lazarus & Folkman, 1984; Meichenbaum, 1985). The categories selected were relaxation- breathing, positive imagery, general self-talk (positive thinking), skill/game specific self-talk, seeking social support, withdrawl-avoidance, blocking-out (thought-stopping), humour, and concentration. Players responses, sorted by gender, are reported in Table 22.

From the players responses, one may infer that many players claim to use numerous problem and emotion-focused skills often taught in intervention programs. The categories of general self-talk, positive imagery, and breathing/relaxation are reported most often. The coping strategy of concentration also is widely reported although it is difficult to define what players interprete "concentration" to mean. It may reflect skill/game specific self-talk or it may possibly be a response "error" which occurs with retrospective data. Many coaches often encourage players to "concentrate" or "relax". Unfortunately, although players report using these coping strategies, it does not follow they know the meaning of these terms or are applying the coping strategies in an effective manner during distressing situations.

It is of interest to note that males claimed to be making more use of the emotion focused coping strategies of humour, blocking-out, and withdrawl/avoidance. Almost all females responses fall under the problem-focused skills of self-talk and concentration and the emotion-focused strategy of breathing/relaxation.

E) PROGRAM EVALUATION QUESTIONNAIRE

The investigator believed it was important to probe into the players' perception of the SMT program. Eleven questions were constructed to evaluate various aspects of the program ranging from strategy effectiveness and preference to suggestions for improving compliance (see Appendix G). The players' answers, which were returned by all eight females but only five males, will be descriptively analyzed.

Questions one and two inquired about the effectiveness of the program in helping the athlete understand and control the stress process. Both male and female groups found the program moderately effective in both understanding and controlling stress. These responses provide additional support that SMT is an effective stress management program.

Question three through five were concerned with the effectiveness of coping strategies taught in the program. The players' responses are summarized in Table 23. The players indicated that the components of general self-talk, progressive relaxation, and skill specific self-talk were the most effective strategies whereas meditation, irrational beliefs, and the integrated coping responses were deemed the least effective. The lack of perceived effectiveness and preference for the integrated coping response questions the validity of obtaining the goals of the SMT program. Smith (1980a) stated the goal of SMT is to teach the players an integrated coping response having somatic and cognitive components which can be applied in stressful situations. The players, on the other hand, preferred to use the components separately. This finding demonstrated the importance of considering individual differences and the ability of the individual to actively manipulated acquired skills to meet desired goals beyond the limited or contrived goals of the experimenter. Nevertheless, players' responses to question eight revealed that many players (n=10) reported using the integrated coping response at least once a week. Only two female players reported never

using the coping response.

Question six asked players to identify stress-reducing coping skills that could be incorporated into future programs. A number of different strategies were identified including energizing (Botterill, 1986), problem-solving (Heppner, Neal, and Larsen, 1984), communication skills (Gordon, 1970), precompetitive strategies (Rushall, 1981), and visualization (Suinn, 1972). These multi-dimensional skills imply that a generic coping program like stress inoculation training (Meichenbaum, 1985) may be more appropriate to meet the demands and special needs of athletic populations.

Compliance is always a major problem in any intervention program in a sport setting (Cox, 1987). In response to question nine, the players overwhelmingly suggested that compliance could be improved by incorporating the coping skills training directly into the physical practice sessions. Another suggestion was to include more symbolic or guided modeling (Bandura, 1977; McAuley, 1985; McCullagh, 1986), especially having top National and International volleyball players demonstrating the use of coping skills under different conditions. Bandura (1977) has argued that modeling is a good source to increase a player's self-efficacy expectations, which he argued is the mechanism underlying all behavior change. Any future program should attempt to take heed of the above two suggestions because compliance is the crucial feature of any intervention strategy.

During the program players were required to submit homework assignments to aid in compliance. Question nine asked players to recall how often they practiced the components. The responses, summarized in Table 24, correspond to those of questions three and four. The strategies of relaxation, general and specific self-talk were practiced on average of once a day, whereas the strategies of the integrated coping response, irrational beliefs, and meditation ranged from twice a week to once every two weeks. This retrospective data

clearly implies that preference, effectiveness, and compliance are highly related. The strategies of relaxation and self-talk are more easily acquired compared to the other three strategies and probably more easily applied. Again the players' responses question the utility of Smith's (1980a) full integrated coping response.

The last two questions probe the use of coping skills at the National Challenge Cup and whether players had retrospectively wished they had spent more time practicing the coping skills. Almost all the males and females reported using the skills. They reported using the skills for a variety of stress situations and reasons such as controlling arousal levels, increasing confidence after making mistakes, in close games, and to reduce nervousness. All the women, except one, wished they had spent more time practicing the coping skills. On the other hand, all the males believed they had spent an adequate amount of time practicing the coping skills. This gender difference may have been related to the team's performances. The men's team finished with a bronze medal compared to the women's team sixth place standing.

The observation that women had preceived they had inadequate coping skill practice may have been a contributing factor to the gender differences at follow-up assessment. An appreciation that there may have be deficiencies in coping skill ability may have been a necessary condition to motivate the athletes to continue rehearsal of the coping skills. The males, on the other hand, may have become complacent and decided that continued rehearsal of the coping skills was not necessary for volleyball success. Clearly, additional research is needed to identify motivational charateristics which contribute to the conditions producing long-term compliance and development of coping skills in athletes.

In summary, the findings from the program evaluation questionnaire provide growing support for the effectiveness of SMT in helping athletes ameliorate the stress process. At the

same time there is an implication that, inconsistent with Smith's (1980a) goal of teaching athletes to utilize an integrated coping response, athletes may prefer to employ particular coping strategies in specific stressful situations. This finding is consistent with the viewpoint that different forms of coping may be associated with successful outcomes in different situations (Cohen, 1984; Folkman, 1984; Meichenbaum, 1985). The integrated coping response is a general semi-flexible coping response that may be inappropriate or simply less effectve in specific contexts compared to other coping strategies. The findings further reinforce the need to gain a better understanding of coping processes in the human adaptation process (Holahan and Moos, 1987; Folkman, Lazarus, Schetter, Delongis, and Gruen, 1986).

CHAPTER 5

Discussion

This final chapter will summarize the present study and review the results. The quasi-experimental nature of the study obligates a thorough discussion of relevant limitiations and validity issues. This detailed discussion will be followed by theoretical and practical implications and suggestions for future research into stress processes in athletic settings.

A) Summary

The purpose of the present study was to investigate the effectiveness of Cognitive-affective Stress Management Training in a controlled study. The SMT program is a cognitive-behavioral coping skills intervention package designed to teach athletes an Integrated coping response having somatic and cognitive components (Smith and Smoll, 1982). The target sample for this study were the Alberta 1987 Canada Games men and women volleyball teams. Treatment players received eight- one hour modules approximately one week apart. The primary assessment period was pretreatment and posttreatment. Following recommendations by Meichenbaum (1977) and following the conceptualizations of the transactional stress perspective (Lazarus and Launier, 1979), phenomenological and behavioral measures of affect, cognition, and performance domains were assessed. Additional data was collected at the National Challenge Cup, a six month follow-up of treatment subjects, and by a program evaluation questionnaire.

The present study attempted to extend previous research into the efficacy of SMT in several related ways. First, to increase internal validity, a control group was included in the design. Second, a number of dependent measures were evaluated to assess the convergence of effects across affective, cognitive, and performance domains. Third, a follow-up assessment was included to evaluate the durability of coping skills changes. Fourth, the perceived effectiveness of the program was evaluated by means of a program evaluation questionnaire.

The study had five primary and five secondary hypotheses. The primary hypotheses for cognitive and performance measures provided converging evidence to support the efficacy of SMT in an athletic setting. There was also evidence of gender differences with females exhibiting stronger treatment effects for some measures. Each of the hypotheses will be considered below in a review of each dependent measure.

Affective Measures

An examination of adjusted means for SCAT at posttreatment did not support the hypothesis that players trained in SMT would have significantly lower self-reported competitive trait anxiety compared to the controls. The follow-up data did not produce any meaningful results to challenge this conclusion.

The adjusted means for CSAI-cog and CSAI-som at posttreatment did not support the hypothesis that the treatment group would have lower competitive state anxiety compared to the controls. The analysis at the follow-up did indicate the presence of gender differences for treatment groups. The females group had reduced cognitive and somatic anxiety from pretreatment to follow-up. An examination of group means from the Challenge Cup revealed that the control group had lower cognitive anxiety compared to the treatment male group, whereas the control female group had lower somatic anxiety in some games compared to the female treatment group. The Challenge Cup findings are contrary to the hypotheses. Possible construct invalidities related to method effects (Fiske, 1987) will be discussed in detail in a later section.

An examination of adjusted means for the CSAI-II self-confidence subscale at posttreatment did not support the hypothesis that treatment players would have higher self-confidence compared to the controls. The follow-up analysis revealed similar gender differences as reported for CSAI-cog and CSAI-som. The group means from the Challenge Cup did not reveal any treatment effects.

An analysis of Pearson r correlation coefficients at pretreatment and posttreatment indicated significant linear correlations between affective measures. As hypothesized, SCAT was positively related to CSAI-cog and CSAI-som and negatively related to CSAI-sc. Furthermore, CSAI-cog and CSAI-som were positively related whereas CSAI-cog and CSAI-som were negatively related to CSAI-sc.The linear relationships between CSAI-II subscales were qualitatively different at the Challenge Cup compared to pretreatment and posttreatment. When separated by gender, female correlations for the CSAI-II subscales were consistent with the pretreatment and posttreatment results. For the males, however, there did not appear to be any consistent linear relationship between any of the subscales. In some cases, cognitive and somatic anxiety were positively related and negatively related in other cases (all nonsignificant).

Cognitive Measures

The hypotheses concerning systematic changes in players' thoughts were partially supported by the results. ANCOVA revealed significant differences for negative thoughts to both video-taped stressors for the treatment groups compared to the controls. As expected, positive thoughts showed trends in the expected direction. The follow-up analysis revealed gender differences for the treatment groups. For scene one, females significantly reduced the percentage of negative thoughts and increased the percentage of positive thoughts from pretreatment to follow-up. There were also statistically nonsignificant trends for gender differences for scene two.

The results indicate that that the treatment effects were stronger for females. However, the portion of the study that included the control groups showed a significant treatment effect for negative thoughts for both females and males. Therefore, the primary hypothesis that treatment players should have fewer negative thoughts compared to the controls was

supported. Nevertheless, the follow-up clearly hightlights that the treatment effect was more durable and prominent for the females.

Self-efficacy

The results of the present study did not support the hypothesis that players trained in SMT would have higher general self-efficacy scores compared to controls. An examination of group means indicated that groups remained fairly stable over assessment periods.

Performance

An examination of adjusted means at posttreatment clearly indicated that treatment players improved service reception performance compared to the controls. There was no difference from posttreatment to follow-up. The data supports the primary hypothesis that the treatment group would have higher performance scores compared to the controls. Unfortunately, lack of interpretable data made comparison in game competitive situations (Challenge Cup) not possible.

A number of secondary hypotheses predicted linear or curvilinear relationships between affective measures and performance. An examination of the correlation matrix at pretreatment and posttreatment did not show any consistent linear relationships between affect and performance. Visual analysis of affective-performance graphs revealed no discernable curvilinear relationships.

B) Limitations and Validity Issues

Applied experimental evaluation of complex treatment packages in field settings, coupled with the quasi-experimental design, presents numerous problems (Campbell, 1987). These problems create specific limitations that must be addressed in evaluating the study's validity. The following section will use Cook and Campbell's (1979) seminal work on validity issues

in quasi-experimental designs to assess the limitations and validity issues inherent in the present study.

In applied experimental research, there are four major decision questions that a researcher must address pertaining to the covariation of independent and dependent variables (Cook and Campbell, 1979). First, does a relationship exist between two or more variables. Second, if such a relationship is present, is the relationship causal. For example, did Cognitive-affective Stress Management Training (SMT) cause the changes in thoughts to the video-taped stressors and the increase in service reception performance or would these changes have occured in the absence of SMT. Third, what are the particular cause and effect constructs involved in the plausibly established causal relationships. Fourth, how far can one generalize the causal relationship to and across persons, settings, and times. Cook and Campbell (1979) argued that the above four major questions, which refer to statisical conclusion validity, internal validity, construct validity of supposed causes and effects, and external validity, must be carefully evaluated in determining the effectiveness of Cognitive-affective Stress Management Training in the present study.

The researcher is faced with making important judgements in determining the relative priority of validity types (Campbell, 1987; Taylor, 1987). Some form of priority needs to be established because increasing one validity type often decreases another validity type. For example, the construct validity of effects (e.g., performance) can be increased by having multiple operationalizations (performance outcome, coach's perception of performance, player's perception of performance, biomechanical analysis of performance). Unfortunately, these multiple performance operationalization will increase measurement time and possibly decrease reliability, ultimately resulting in lower statistical conclusion validity (Cook and Campbell, 1979).

The priority of validity types will weigh heavily on the kind of research being conducted

(Campbell, 1987; Cook and Campbell, 1979). In theory testing, construct validity and internal validity are often identified as the most important because it is critical to show that the theoretical constructs alpha and beta are the variables involved and that the causal relationship goes from construct alpha to construct beta (Cook and Campbell, 1979). For instance, if a researcher was testing Bandura's (1977) hypothesized self-efficacy relationship to coping behavior, the researcher must determine if the construct operationalizations of self-efficacy and coping were indeed representive of self-efficacy and coping and not self-esteem and reflexive behavior (see Lazarus and Folkman, 1984; Weinberg et al., 1985). Furthermore, changes in coping must be caused by self-efficacy, not by alternative factors like increased attention.

The priority of validity types is often different in applied research, where the critical question is whether the treatment package (e.g., SMT) made a real difference (internal validity) in alleviating or preventing a problem (Campbell, 1987). The researcher also strives to generate changes in a such a context (person, setting, and time) so that it is possible to generalize (external validity) across persons and setting or to specific target populations (Cook and Campbell, 1979). Cook and Campbell (1979) suggested that the priority of validity types for applied researchers should be internal validity, external validity, construct validity of the effect, statistical conclusion validity, and construct validity of the cause.

In the present study, the relative priority of validity types must be based on the constraints of the study and the central research question; that is, is SMT an effective stress management program in athletic settings. Internal validity is critical because it is necessary to determine if the significant effects found in this study were caused by the intervention program. Yet, internal validity is related to the other validity types. Although the treatment package produced changes in specific dependent measures, did the treatment package represent Smith's (1980a) SMT program and did the operationalized dependent measures truely represent the theoretical

constructs of anxiety, cognition, and performance. Furthermore, any conclusion concerning internal validity is highly dependent on making appropriate and valid statistical conclusions. Thus, all validity types are important and must be considered carefully.

In the following subsections, the impact of each validity type on evaluating the SMT program will be carefully weighed. Addressing the various limitations of the present quasi-experimental study, the relevant threats to each validity type will be discussed. The order of validity types was based on the four major decisions a researcher must consider in any study (Cook and Campbell, 1979): statistical conclusion validity, internal validity, construct validity of causes, construct validity of effects, and external validity.

Statistical Conclusion Validity

Any valid conclusions about evidence of covariation between variables must depend on an analysis of appropriate statistical techniques (Cook and Campbell, 1979). The researchers must consider statistical power, evidence of covariation, and the strength of such covariation. Factors like effect size, sample size, level of significance set by the investigator are all related to statistical power. Furthermore, other factors such as reliability of measures and random irrelevancies in the experimental settings must be carefully examined in quasi-experimental studies (Cook and Campbell, 1979; Taylor, 1987).

A major threat to statistical conclusion validity is low statistical power, especially in cases where the conclusion is that the treatment does not effect a variable (Cook and Campbell, 1979; Deikis, 1983). The correct rejection of the null hypothesis depends upon the sensitivity of the statistics employed (as well as experimental design), which is related to effect size, sample size, alpha level, and the statistical test employed. The smaller the sample, the greater the differences among the group means must be to find statistical significance (Keppel, 1973; Stevens, 1986). A nonsignificant F ratio cannot be taken as strong evidence for lack of treatment effect.

In the controlled portion of the present study (pretreatment and posttreatment), it was concluded that the treatment (SMT) did not have a significant effect on anxiety, self-efficacy, and positive thoughts. One could argue that the present study lack statistical power to make such conclusions. For anxiety measures, such an argument seems unwarranted. The effect sizes for trait anxiety, somatic state anxiety, and cognitive anxiety are all very small (see figures 6, 7, & 8.). Even given large sample sizes, the difference between the group means are far too small to have any practical significance (Stevens, 1986).

The problem of statistical power may be a factor for the measure of positive thoughts, especially when assessing the evidence for higher order treatment by gender interactions. For positive thoughts to scene one, there appears to be a treatment by gender effect at posttreatment (see figure 10). Even given a liberal alpha level of p=.1, the null hypothesis was not rejected. A larger sample size may have produced significant effects, especially since there is evidence for a treatment effect for negative thoughts for scene one. Given these associated factors, there is some evidence to question the isolated conclusion of lack of treatment effects for positive thoughts. However, the general conclusion was that there was a convergence of evidence suggesting that the treatment program (SMT) did influence cognition and that there was evidence of gender differences. Therefore, isolated lack of treatment effects do not present any significant problems to question the statistical conclusion validity of the present study.

Another major threat to statistical conclusion validity is low reliability of measures (Cook and Campbell, 1979). In the present study, low reliability of measures was not considered a major problem as all established self-report questionnaires (SCAT, CSAI-II, SES) have acceptable test-retest or internal consistency reliability (see measures section.). Furthermore, the dependent measures which required coding (thought-listing and performance) had high inter-rater reliability (r=+.85). Other data sources such as the ancillary questionnaire and the

program evaluation questionnaire must be treated with caution as their psychometric properties are unknown. However, the data from these last two questionnaires allowed the investigator to qualify the findings and to speculate about reasons for the SMT program's relative effectiveness.

A third major threat to statistical conclusion validity is determining whether the treatment is powerful enough to produce treatment effects (Taylor, 1987). The most prevalent source of insufficient treatment power is lack of treatment time. Unlike some other psychological interventions in sport (e.g., Epstein, 1980) which have been criticized as lacking treatment power (see Taylor, 1987), the present study employed a treatment package consisting of eight-one hour weekly sessions complimented by daily homework assignments. It is plausible that more time may have been required to thoroughly acquire and apply each of the coping skills components. Yet, it is difficult to ascertain how much time is adequate.

If we consider the players' responses on the program evaluation questionnaire, it is possible that a stronger treatment effect could have been produced if the treatment package was incorporated more systematically into the technical practice sessions. Several players believed, quite plausibly, that the coping skills would have been easier to learn and apply in real game situations if the coach had structured the practice in such a way that the coping skills could have been practiced on a regular basis. Optimizing psychological skill development in practice represents a major challenge that coaches and sport psychologists must collectively work towards.

The last major threat to statistical conclusion validity to be considered is the intrusion of random irrelevancies in the experimental setting (Cook and Campbell, 1979). In the complex field settings, random irrelevancies are always a potential problem. Factors such as school examinations, interpersonal relationships, selection to the National Challenge Cup Team, death or illness in the family, may affect scores on the selected dependent measures. In the

present study, it is unknown what, if any, random irrelevancies influenced the statistical conclusion validity. The inclusion of a control group up to posttreatment helps control for some of these problems. Given the small sample size, however, the control group does not guarantee that the dependent measure scores are not bias by random irrelevancies. This specific problem supports the neccessity of numerous studies to provide convergence to determine the effectiveness of Smith's (1980a) SMT program or any other treatment package (Campbell, 1986, 1987; Cook and Campbell, 1979).

Internal Validity

The second major decision question that a researcher must answer is whether a significant outcome was caused by a specific treatment package rather that by some unrelated variable (Campbell, 1987; Taylor, 1987). In the present context, were the significant treatment and treatment by gender effects caused by the SMT program or by some other event which occured between pretreatment and posttreatment. Any differences between posttreatment and follow-up cannot be solely attributed to the SMT program without the inclusion of a control group. However, any changes in the treatment phase of the study needs to be carefully evaluated with respect to internal validity in assessing the effectiveness of SMT in sporting situations.

Campbell (1987) stated the concept of internal validity needed to be relabeled in applied research and called "local molar validity". The term local refers to whether the treatment works in some specific setting and time. Campbell (1987) stated,

> By molar we connote recognition that the treatment is often a very complex hodgepodge (from the point of view of abstract analytic-theoretical science), which has been put together by expert clinical judgement, and not on the basis of the already proven efficacy of its theoretically pure components (p.415).

The evaluation of Smith's (1980a) SMT program generally falls within Campbell's (1987) notion of local molar validity. The SMT program is a complex treatment package put together by R.E. Smith and his colleagues (Smith, 1980a, 1980b, Smith and Smoll, 1982;

Smith and Ascough, 1985), based not only on clinical judement but also on cognitive-arousal theories of emotion (e.g., Lazarus, 1966; Schachter, 1974). Within the present study, we can only truely assess if the SMT program made a real difference with the group of high performance youth volleyball players in Alberta during the specific treatment time frame.

There are several major threats to local molar validity which the researcher must considered when assessing whether the SMT program caused the significant changes in several dependent measures (Cook and Campbell, 1979; Taylor, 1987). These threats are labeled history, selection, maturation, mortality, and resentful demoralization.

In the field settings, the investigator does not have the same advantages available to the laboratory researcher in insulating subjects from outside influences which could produce confounding effects (Cook and Campbell, 1979). History influences such as school final examinations and notification of university acceptance may possibly influence dependent measures and confound causal relationships.

The employment of a control group in the first phase of the present study allows protection against history influences invalidating the conclusion that the SMT caused the significant treatment effects. Both treatment and control groups were equally likely to score well or poorly on school exams or to be influenced by the other outside factors (e.g. additional physical or psychological training). Therefore, for the controlled phase of the study, it is possible to rule out history as a local threat to local molar validity, although such factors cannot be eliminated for the follow-up assessment.

In any quasi-experimental study where subjects are not randomly assigned to treatment and control groups, selection is considered a major threat to internal validity (Cook and Campbell, 1979). In the present study, players were assigned to groups based on geographical considerations. It would not have been practically or financially feasible to employ totally random procedures. The selection procedure used, although superior to studies

where subjects selected groups that were then assigned to experimental groups (see Diekis, 1983), does raise questions about internal validity as the treatment players may have been qualitatively different from the control players.

Upon examinations of the ancillary questionnaire and the pretest measures, there does not appear to be strong evidence to support the qualitive difference argument. The control and treatment groups have similar playing experiences, provincial representation, and responses to stress. Although there are some differences between groups on some dependent measures, there is no consistent convergence of data supporting the view of qualitative differences between the groups.

The threat of selection will always be a problem in field settings (Cook and Campbell, 1979). In the applied sport psychology field, the investigator must be careful not to select groups that come from obviously different populations in evaluating an intervention package, unless the experimental question pertains to assessing differences between populations. In the present study, there is no reasonable evidence to suggest that selection was a threat to the conclusion that SMT caused the significant treatment effects.

When evaluating a treatment package over time, differences between pretreatment and posttreatment scores, especially for performance, may be due to maturational effects rather than the treatment. This threat to internal validity is especially a problem in uncontrolled studies in sport (e.g., Meyers & Schleser, 1980; Smith, 1980a; Smith & Smoll, 1978). Athletes continue to practice during the treatment intervention; therefore, practice becomes a potential confound. The potential confound of practice becomes more serious and complex if Smith (1986a) is correct that changes in one component will influence all other components in the stress process (i.e., situation, cognitive appraisal, and physiological arousal). Furthermore, maturation may cause changes in coping skills due to new and different life experiences. Maturation effects in the present study were controlled through the inclusion of a

control group. Any changes in the uncontrolled phase (posttreatment to follow-up), however, are confounded by maturation. Nevertheless, since most significant changes or trends to change occured in the controlled phase, maturation effects cannot invalidate the conclusion that SMT produced significant changes in variables related to the stress process.

The internal validity threat of mortality occurs when individuals, especially different kinds of individuals, drop out of a particular experimental group (Cook and Campbell, 1979). Mortality was a problem in the present study as three female controls and two male controls dropped-out. It is plausible that this selective mortality produced a selection artifact. On the other hand, it is quite plausible that rather than producing a threat to internal validity, the mortality in the present study may have lead to an under-estimation of treatment power. First, the loss of several subjects results in a loss of degrees of freedom and reduces statistical power. Second, the case could be made that players with poorer coping skills choose to drop out because they were unable to handle the competitive pressure (Lazarus and Folkman, 1984) or are more suseptible to injury (Cryan & Alles, 1983). The loss of players possessing a limited coping skills repertoire would inflate the strength of the control group relative to the general target population. Therefore, treatment effects would need to be more powerful to produce statistically significant effects. Thus mortality does not appear to be a valid threat to the internal validity of the study.

A possible damaging effect involved in intervention programs in sport settings is resentful demoralization of the control group. Intervention programs are designed to facilitate performance and thus, may give treatment players the "edge" over control players in team selection. The control group may respond with anger, depression, and loss of motivation (Cook and Campbell, 1979). The cognitive and behavioral manifestations of resentful demoralization may produce differences at posttreatment that are not due to the treatment program.

Resentful demoralization was a possible threat to the conclusion that treatment effects were caused by the SMT program. Almost all the players were aware of the term "stress management" and were cognizant of the possible performance enhancement benefits. It is difficult to directly assess if the control group was demoralized. However, when control players had an opportunity to take the SMT program, only one player contacted the present investigator. As a note of interest, this female player probably already possessed the best coping skills of all the controls.

In summary, there is little evidence to suggest that threats to internal validity invalidated the conclusion that SMT caused the significant treatment effects in the present study. This point cannot be understressed as Campbell (1987) argued, "For the applied scientist, local molar validity is a first crucial issue and the starting point for other validity explanations" (p. 451).

Construct Validity

A critical issue in any research endeavor is to effectively operationalize each of the theoretical constructs under experimental scrutiny (Fiske, 1987; Taylor, 1987). The issue of construct validity is concerned with the problem of confounding, which refers to the possibility that the operations designed to represent one construct are also measuring or being influenced by one or more different constructs (Cook and Campbell, 1979). The construct validity of causes (e.g., treatment and/or gender) and construct validity of effects (e.g., dependent measures like SCAT and CSAI-II) are crucial in evaluating the measurement and findings of the present study (Fiske, 1987).

The construct validity is an important issue in research. In sport psychology research, the investigator must clearly and effectively operationalize the construct, which is often done by developing specific tests to measure some psychological attribute (Taylor, 1987). This process is much easier, although still complex, when operationalizing a single psychological

construct like self-efficacy (see Bandura, 1977; Weinberg et al:, 1981). The operationalizing process is dependent on appropiate methods including,

> identifying the target construct, selecting a suitable protocol, applying measuring operations that assign numerals to the protocol or to parts of each, and interpreting the obtained measurements (Fiske, 1987, p.286).

When assessing the construct validity causes in the present study, the investigator must determine if the particular treatment package that was administered to the volleyball players was a valid operationalization of the "theoretical" SMT program. This is a far more difficult question to answer compared to assessing the construct validity of a single psychological construct. The problem of construct validity of causes in complex intervention packages has been recognized by Cook and Campbell (1979) who stated,

> For many treatments in applied research are complex packages of variables rather than indicators of apparently unidimensional constructs. Consequently it will often be difficult to describe and reproduce the whole package, making replication more difficult than if the causal components of the package had been well specified and their independent contributions had been explored (p.63).

Several writers have suggested methods to guard against the intrusion of unwanted factors like administrator effects, attention effects, and group effects which threaten construct validity of causes (Cook and Campbell, 1979; Fiske, 1987; Taylor, 1987). Taylor (1987) has argued that the use of multiple administrators and multiple treatments (multitrait-multimethod matrix proposed by Campbell and Fiske [1959]) would increase the construct validity of the treatment. According to this proposal, the SMT program would be given by three different administrators using three different SMT programs. If the treatments had high convergent validity, there should be similar treatment effects across administrators (Taylor, 1987).

The multitrait-multimethod matrix is of limited use in many field settings because of the difficulties in obtaining both a target population of sufficient size and a sufficient number of qualified administrators. In many applied research settings, the researcher must operate within

logistical constraints. This is emphasized by Campbell's (1987) assertion that the applied researcher must stay within the problem, attempting to improve the research validity within the constraints of the problem population and setting.

Within the present context, the construct validity of the SMT treatment was strengthened by the use of a training manual (see Appendix A). This manual was based on the writings of Smith and his associates (Smith, 1980a; Smith and Smoll, 1982; Smith and Ascough, 1985) and was adopted from the general SMT training manual developed by Smith and Rohsenow (1986). The training manual allowed a standardized training protocol to be followed. Furthermore, the SMT program is a general framework that is adjusted to meet the general needs of the individual. As long as the general SMT framework is simulated, one could argue that the treatment package in the present study in an operationalization of the "theoretical" SMT program.

The importance of understanding the causal contingencies must be underscored; however, (Cook and Campbell, 1979) argued that applied researchers are often more concerned with high construct validity of effects than causes. This orientation towards providing evidence that the targeted problem was effected by the treatment results in more care in measuring outcomes. Within the present context, the researchers must ask if measures like SCAT (Martens, 1977) and CSAI-II (Martens etal., 1983) are appropiate measures of anxiety and did the protocol of measuring produce sources of variance in these dependent measures (Fiske, 1987). It is important to demonstrate that all the dependent measures are free of construct invalidity to truly evaluate the efficacy of the SMT program.

The process of identifying and operationalizing the target construct is a major threat to construct validity (Fiske, 1987). In the present study, several of the measures (SCAT and CSAI-II) have been the subject of an extensive psychometric process resulting in generally positive appraisal of their construct validity. For example SCAT and CSAI-II have better

concurrent validity in sporting settings than other anxiety measures (see Martens, 1977; Martens et al., 1983). Nevertheless, early evidence for CSAI-II indicated poor predictive validity to performance. Very recent evidence, however, has suggested that CSAI-II's construct validity may be enhanced by using intra-individual rather than inter-individual analysis (Burton, 1987; Gould, Petlichkoff, Simons, & Vevera, 1987).

The construct validity of the performance, thought-listing, and self-efficacy measures are all open to question due to lack of psychometric scrutiny. It is crucial to justify that construct validity of the performance and thought-listing measures since these specific measures provided the critical support for the conclusion that SMT is an effective program in controlling the stress process.

To assess performance ability, it is necessary to present the player with an appropiate performance problem. Further, the player must implicitly or explicitly agree to attempt to maximally perform the task (Fiske, 1987). The service reception task used in the present study was considered an appropriately difficult and ecologically valid performance problem. Since one of the staff coaches was serving and the players were competing for selection to the Canada Games Team, the players would most likely be attempting to perform maximally. The protocol (see procedures) was considered appropriate as the ten receptions allows for a calculation of average passing ability. The protocol could be strengthen by more carefully controlling the rate of serving by the coach, the exact positioning of the setter, and the distracting verbal comments from the subjects, all factors which weaken the construct validity of the performance measure (Fiske, 1987). Overall the selected protocol and task, however, provided sound construct validity for performance.

The thought-listing procedure is designed to assess the cognitive processes of the individual in a specific context. The procedure has been argued to be a valid operationalization of the target construct of human thoughts (Cacioppo and Petty, 1981; Long, 1984). Fiske

(1987) stated that self-reports are a notorious source of construct invalidity. However, Fiske (1987) acknowledged that self-reports may be valid if the player anticipates making them and makes these reports immediately following the experiences. Both of these conditions were met in the present study. Furthermore, the situations were also volleyball specific, therefore, increasing the prospect of construct validity.

The self-efficacy measure (Copell's [1980] Self-Efficacy Scale) probably was weak in construct validity. After a careful retrospective content analysis, the SES does not seem to capture the essential features of Bandura's (1977) self-efficacy construct. Bandura (1977, 1982) argued that self-efficacy was often context specific, although he proposed that self-efficacy could generalize to other similar situations. Copell's (1980) SES scale probes general feelings of competence. Bandura (1982) has pointed out that individual may feel competent in one situation but lack competence in a different situation. It is possible that the SES is measuring other related global constructs like self-esteem and internal locus of control (Rotter, 1966). Interestingly, other researchers have also developed general self-efficacy scales (e.g., Sherer, Maddux, Mercandonte, Prentice-Dunn, Jacobs, and Rogers, 1982). Future research must carefully consider the conceptualization and measurement of the construct of self-efficacy since Bandura has strongly advocated that all psychological interventions produce change mediated by the mechanism of self-efficacy.

Another major threat to construct validity occurs when only one measure of the dependent variable is used (Cook and Campbell, 1979). A more severe case of mono-operation bias is employing only one measure to determine the effectiveness of an intervention (e.g., Zeigler et al., 1982). The present study used multi-indicators of the domains of anxiety and cognitions. These indicators, however, are limited as each dependent measure was constructed to assess a specific target construct within each domain. On the other hand, the use of multiple indicators would have increased measurement tedium and plausibly reduced measurement reliability.

Several players commented that the existing dependent measures took a long time.

The performance measure was possibly bias by the single measure of service reception. The limitations of validly assessing other volleyball skills was previously discussed in the methods section. It is conceivable, however, that multiple measures of service reception may have provided increased convergence to enhance the construct validity of performance (Taylor,1987). Nevertheless, from an ecological validity viewpoint, service reception outcome is a strong indicator of an important and specific volleyball skill.

The last major topic to be addressed in construct validity of effects is the problem of selecting an appropriate protocol. The researcher must decide if the protocol employed in measuring the construct are appropriate to the construct's requirements (Fiske, 1987). As previously mentioned, inadequate protocol in assessing CSAI-II may have been reduced construct validity. This problem of protocol will be discussed for each of the relevant dependent measures.

The present study required each of the players to complete the CSAI-II about two minutes before a controlled service reception performance or in the five and five period preceding a match in the National Challenge Cup. This protocol is plausibly inadequate to measure performance anxiety. State anxiety, by definition, is a temporary affective state that may be constantly changing. Several investigators have documented the differential time course changes in cognitive and somatic anxiety (Martens et al., 1983; Krane and Williams, 1987). Therefore, it is very conceivable that pre- competitive anxiety is not an accurate reflection of performance anxiety. There does not appear to be any appropriate protocol which would enhance the construct validity of CSAI-II in measuring competitive anxiety. The sport psychology field awaits the development of a valid state anxiety measure for competitive situations.

One could argue that precompetitve anxiety levels are still a good indicator of whether

athletes are able to cope with stress. The weakness of the argument is that there is often little at stake in the pre-competitive period. The lack of cost or benefits in the precompetitive period provides no incentives for the athletes to cope, unless the anxiety levels are totally dysfunctional. These points, along with the above protocol problems, strongly suggest that the CSAI-II may be a poor measure for assessing the athletes ability to manage affective states.

The thought-listing technique does not suffer from the serious limitations of the CSAI-II. Rather, the protocol for thought-listing may be limited in generating the richness and depth of players' thoughts compared to other cognitive assessment techniques. Recent evidence suggests that think-aloud procedures provide a greater frequency and quality of thoughts compared to thought-listing (Blackwell et al., 1985). The thought-listing technique may have underestimated the magnitude of change in players' thoughts. The low frequency of thoughts for each player on each scene prevented a more thorough content analysis and categorization of thoughts (i.e., preparatory self-talk, problem identification, denial, reappraisal). On the other hand, the think-aloud procedure would require more time (players would have to be assessed individually) and may create problems of statistical conclusion validity. However, the additional cognitive information could prove enriching since a major component of SMT is the development of mental coping skills.

External Validity

External validity addresses whether the observed relationship in the present study can be generalized to and/or across persons, settings, and time (Cook and Campbell,1979). External validity is characterized by the extent to which we can generalize the possible outcomes attributed to the SMT program to another set of treatments, samples, and settings that were not examined (Taylor,1987). In other words, would similar converging outcomes be found when a similar coping skills program was applied to other high performance volleyball players, to

volleyball players of a different ability level, to other sporting populations. The validity of generalization would partially be a function of the validity of the theory or treatment package (Campbell, 1987). The continued evolution and refinement of the SMT program, along with the development of training manuals, increases the possibility that the SMT program can be reliably reproduced in other settings and times. The development of training manuals plus the clear description of the characteristics of the sample increase our confidence in generalizing the essence of the present outcomes to similar volleyball groups.

The reader should be cautious in generalizing all outcomes to other target samples, settings, and times. The presence or absence of high-order interactions, especially treatment by gender interactions, may not be found with similar groups. No other SMT intervention studies have reported gender differences. As noted in the section on construct validity of effects, further work is needed to clarify the protocols of measures like thought-listing (or alternative cognitive assessment techniques). All outcome measures must be considered as a converging package that supports the effectiveness of SMT in helping athletes to acquire and apply coping skills to control the stress process and enhance skill performance. To expect identical results with even a highly similar sample would be folly.

Generalizing across types of persons, settings, and times is an important step in intervention programs. But it represents a step that is wrought with danger. Generalizing across populations or sub- populations is important for assessing how far we can generalize the effectiveness of the SMT program (see Cook and Campbell, 1979). Yet, because athletes within sports and across sports may have unique psychological and physiological characteristics and demands, it is difficult to be confident in generalizing research findings (Taylor, 1987).

Two major factors are involved in assessing the boundaries of generalization: the principle of proximal similarity and evidence of supporting empirical research. As previously

discussed, Campbell, (1987) asserted that generalization is strongest to other types of persons, settings, and time which share similar attributes. In other words, one may confidently generalize the present findings to sporting populations which lie close on a gradient of similarity (Judd and Kenny, 1981) to volleyball. The convergence and divergence of psychological, emotional, social, and psychological characteristics and demands across sports greatly increases the risk of making numerous generalizations.

Wide generalizations on the basis of only one outcome study is inappropriate. If the empirical literature shows converging evidence of the effectiveness of SMT across different populations, then one may take greater latitude in generalizing research findings. The literature provides evidence that SMT is effective with university football players (Smith and Smoll, 1978), a junior high performance skater (Smith, 1980a), university cross-country runners (Ziegler et al., 1982) and test anxious students (Nye, 1979). The only similarities these groups share are approximately the same age range (university), they are in high achievement situations, and they are all plausibly in potentially stressful situations. Further, given that SMT is a coping skill training program, it follows that SMT would be more effective in ameliorating the stress process in any population which can be characterized as not possessing coping skills to meet the perceived environmental demands that tax or exceed the perceived resources of the person. The mounting evidence seems to support the generalization of SMT to populations which share the above characterictics. Still, additional controlled studies are required to justify the generalization of the SMT program across the wide variety of abilities, ages, gender, and situations found in the sporting world.

C) Theoretical Implications

The findings of the present study, ranging from the testing of the primary hypotheses to

the program evaluation questionnaire, provided the opportunity for formulating various tenative interpretations and speculations on the theoretical implications of the results. Evidence of enhanced performance and the modification of stress eliciting cognitions imply that the mediating role of coping in the stress process must be carefully examined, especially in light of gender differences. The lack of consistent anxiety suppressing effect, despite the evidence that players reported relaxation as a preferred and effective coping strategy, leads to a more controversial speculation that strikes at the theoretical foundations of the coping skills model. These issues of coping and cognitive-affective independence will be scrutinized in the following sections.

Coping has been identified as a critical mediating variable that helps the individual to buffer or moderate the stress relationship (Folkman and Lazarus, 1985; Holahan and Moos, 1987; Long, 1980; McCrae, 1984; Parkes, 1986). Coping is not, however, an unitary process but is composed of a number of different mechanisms. Lazarus and Folkman (1984) suggested that the conceptualization of two coping categories: problem-focused and emotion-focused. Other researchers have argued that the two categories may be too restrictive and have suggested the development of more and clearly defined coping strategies (Holahan and Moos, 1987; McCrae, 1984).

The lack of clearly defined coping categories creates difficulty in the evaluation and refining of coping strategies within a specfic stress management program. For example, Smith (1980a) stated the SMT program has cognitive and affective components. Within the present intervention program we can identify three general cognitive coping strategies (i.e., thought monitoring and challenging, general self-talk, and skill-specific self-talk) and only two direct affective strategies, one somatic (progressive muscle relaxation) and one cognitive (meditation). It is plausible that the different strategies may be employed as problem-focused strategies in one context and emotion-focused strategies in a different context. For example,

relaxation could be used to reduce emotional arousal or as a problem- focused skill to reduce tension in the shoulders to improve service reception. Players may have found relaxation effective in improving performance but not as a general affect-reducing strategy. This would account for the improvement in service reception but the lack of treatment effect on the anxiety measures.

It is plausible that the more directly a coping strategy impacts a particular component of the cognitive-affective system, the more powerful the treatment effect. For the sake of speculation, consider the two stage theories of emotion (e.g., Arnold, 1970; Weiner, 1985). Both theories basically proposed there is an automatic, general, primitive emotion state, followed by a reflective, attributional process. Weiner (1985) argued the attributional stage determines the specific emotional experience. The cognitive strategies in SMT most likely intervene in the reflective, attributional analysis stage. This conscious reflective process would be tapped by the thought-listing procedure. The impact of the cognitive strategies on the initial affective state may not be entirely effective because the strong inner beliefs which generated the initial primitive emotion may be in conflict with the reflective process. For example, the intellectualizing view (Lazarus and Folkman, 1984) that "it is only a game" may be at odds with the well established and societal reinforced belief that winning is important. Cognitive strategies may help control or mute the affective experiences but reflective cognitive states and affective states will probably change at different rates over time.

The absence of a treatment effect for the affective domain may be related to several other theoretical issues. First, the relaxation training may be inadequate to significantly alter the player's initial appraisal of the environmental context. Service reception is an important volleyball skill and has the potential to be evaluated as threatening, especially if commitment to the sport is high (Folkman, 1984). This environmental context may have had an

overwhelming influence on the appraisal process, despite the athlete's attempts to cope. However, the low anxiety scores do not support the existence of high precompetitive anxiety levels. Second, it is plausible that emotion-focused skills like relaxation are inappropriate to control the stress process in certain situations (Folkman and Lazarus, 1985). Many events rapidly trigger or evoke high levels of anxiety (Borkevec, 1976). In these situations, only well established cue-conditioned relaxation responding may be effective. Furthermore, the athlete may have insufficient time and/or be in a restrictive setting to use the relaxation training procedure.

A critical theoretical issue in anxiety research is the identification of dysfunctional anxiety levels. The trait and state anxiety scales proportedly measure levels of anxiety. It does not follow that different levels of anxiety distinguish between adaptive and dysfunctional states. For example, the inverted-u theory holds that there is an optimal level of arousal (somatic anxiety) for top performance which is also related to task complexity. There is little sound experimental evidence what constitutes the bandwidth of optimal anxiety level boundaries. Furthermore, Janis (1958) argued that some level of anxiety is necessary for coping preparation. A lack of anxiety may be dysfunctional in that the protective function of the "work of worry" may be absent to trigger or signal the need for coping preparation required to successfully adapt to the environment. The use of relaxation training may, in some cases, be maladaptive if the athlete attains low levels of anxiety. Further theoretical development was well as experimental investigation is needed to clarify the relationship between anxiety, coping processes, and performance.

The efficacy of any coping skills training program may ultimately depend upon the coping skills- person- environmental match (Holahan and Moos, 1987; Parkes, 1986). As discussed previously, there is not a one-to-one relationship between coping skill and environmental context (Hann, 1984). A coping skill may be highly effective in one context

but maladaptive in another context (Folkman and Lazarus, 1985). Furthermore, individual differences have a major impact upon coping. Researchers in social psychology (e.g., Chan, 1977; Folkman, 1984; Holahan and Moos, 1987; Parkes, 1986) and in the sport setting (e.g., Passer, 1983; Scanlan, 1984; Vallerand, 1983, 1987) have suggested that appraisal, coping, and stress relationships are influenced by individual differences including self-esteem, trait anxiety, perceived competence, control, commitment, personal and task resource capacities.

The athlete's existing coping repertoire, personality and motivational charateristics, and ability to learn and apply new coping skills will have a major impact on the success or failure of any coping skills program. Individual differences were evident in individual player's preferences of coping strategies in the SMT program. Meditation was ranked as one of the least preferred strategies by the treatment groups; however, one player identified meditation as the most important component. Furthemore, some players benefitted more from the SMT program compared to other players, far beyond what any differences in compliance would suggest. These findings imply that individual characteristics may be strong predictors or produce significant interactions with program components to influence coping in stressful episodes (Parkes, 1986).

A theoretical issue related to individual differences is the matching of intervention programs to the preferred coping style of the person (Martelli, Auerbach, Alexander, and Mercuri, 1987). In the health care field, research has shown that intervention outcome is significantly influenced if the preparatory information provided to the patient is consistent with the patients coping style (Martelli et al., 1987).

The experimental literature generally supports the use of mixed intervention programs including both problem-focused and emotion- focused coping skills (Folkman and Lazarus, 1980; Martelli et al., 1987). Mixed intervention programs are probably effective because

coping with stress often involves the use of both problem-focused and emotion- focused strategies (Folkman, 1984). The players in the present study preferred the relaxation component and the self-talk components but rated poorly the combined Integrated coping response. The selected use of specific coping strategies may be related to Folkman and Lazarus's (1985) finding that different forms of coping are more salient at different times. Investigating coping responses before and after college examinations, Folkman and Lazarus (1985) found that problem-focused coping was more prominant before examinations while emotion-focused coping was more prominant after examinations while awaiting the posting of marks. They found, however, that coping was complex in that people combined problem-focused and emotion-focused strategies at each stage of the stress encounter. Folkman and Lazarus findings, along with the results of the present study, imply that an unitary Integrated coping response as advocated by Smith and his colleagues (Smith, 1980a; Smith and Smoll. 1982; Smith and Ascough, 1985) may have limited utility in helping athletes manage stress relationships. Rather, individual coping skills are more effective when combined to meet the needs of the individual in a specific context.

The application of mixed intervention programs may be more effective than either problem-focused or emotion-focused programs for two other reasons. First, emotional behavior and experience changes as the stress situation unfolds (Folkman and Lazarus, 1985). In sport, it has been well documented that state anxiety components change over time as a competitive situation approaches (Fenz and Epstein, 1962; Gould, Petlichkoff, and Weinberg, 1984; Krane and Williams, 1987; Martens et al., 1983). Different kinds of coping strategies may be more effective than other strategies during the different stages of the stress process (Folkman and Lazarus, 1985; Meichenbaum, 1985). Second, different athletes may manifest different types of maladaptive behavior or may be lacking in specific skills (Meichenbaum, 1985). The implementation of a mixed intervention program will provide

some coping skills to meet the needs of athletes in some situations but still be inferior to individualized coping programs. Nevertheless, a comprehensive intervention program like SMT is probably more effective than training in a single psychological skill like relaxation training only (e.g., Lanning and Hisanaga, 1983).

A controversial theoretical implication from the present study is the plausibility of separate and partially independent systems for affect and cognitions. A basic theoretical tenet of Smith's (1980a) SMT program is that cognition precedes affect (e.g., Lazarus, 1984), although it is not a necessary condition for program effectiveness. The cognition-arousal theories of emotion imply that changes in cognitions should produce alterations in affect (Lazarus, 1984; Weiner, 1985; Vallerand, 1987). Given, the primary assumption of the cognitive-arousal theories, changes in the cognitive measures should have been reflected by changes in the affective measures, which was not the case. The lack of congruence between affective and cognitive measures suggests that the measures are assessing qualitatively different systems. This speculation is partially muted by the fact that no specific situational context was assessed by both cognitive and affective measures. Other studies, however, have also found a lack of relationship between affective and cognitive measure (Deikis, 1983; Swann, Griffin, Predmore, and Gaines, 1987).

The independent system position has been advocated by several theorists (Izard, 1984; Tomkins, 1981; Zajonc, 1980, 1984). Zajonc (1984) has argued that there is converging evidence from studies in different areas such as brain lateralization function to support the systems separation position. In an attack on Lazarus's (1982) position that cognition always preceeds affect, Zajonc (1984) stated that there is no evidence that cognition must preceed affect. Leventhal and Tomarken (1986) have also argued there is little evidence to support Schachter's (1964) cognition-arousal theory and they further suggested that specific brain centers and/or specific patterns of corticol activity are involved in the production of particular

emotions. The independent systems position holds that cognition and affective systems are designed for different purposes. The task of the cognitive system is to classify and analyze stimuli properties while the affective system enables the person to respond quickly to threatening situations (Swann et al., 1987).

Lazarus (1984) defended his position on the role of cognitions in emotional experience by arguing that cognition is a necessary condition of emotion because,

> people must comprehend - whether in the form of a primitive evaluative perception or a highly differentiated symbolic process- that their well-being is implicated in a transaction, for better or worse (Lazarus, 1984, p.124).

On this point, the lack of congruence in the present study between the affective and cognitive measures may exist because the thought-listing procedure is assessing primarily higher level symbolic processes like reflective attributions. The verbalization of preconscious processes may not be possible. Therefore, affective and symbolic cognitions may be independent in output, but it does not follow that affect and cognition are independent systems.

The theoretical tussles in elucidating the relationship between cognition and emotion are far from settled. Theorists do seem to agree that cognition can influence emotional experience and behavior either directly through the cognitive appraisal process (Lazarus and Folkman, 1984; Weiner, 1985; Vallerand, 1987) or by muting or transforming the affective response (Swann et al., 1987). Lazarus (1984) suggested that a far more interesting question than whether cognition preceeds affect is how can cognition qualitatively modify affective experience.

Clearly, substantial progress in the cognition-affect separation issue awaits theoretical clarification of global concepts which delimit the boundary conditions of cognition and/or emotion. Fiske (1987) asserted that social and behavioral scientists have been too happy with constructs that are not defined explicitly and comprehensively. Further developments in the

area of emotion in sport and the evaluation of intervention programs like Smith's (1980a) SMT may depend upon redefining constructs at a lower level of abstraction (Fiske, 1987).

D) Practical Implications

An important aspect of intervention research is the generation of practical implications. Many of the practical implications can be derived from the theoretical implications on coping strategies. Further implications can be formulated from considering the converging evidence from the present study and previous sport research using the SMT program (e.g., Smith, 1980a; Ziegler et al., 1982).

The SMT program appears to be effective across sporting populations and modifies cognitive variables related to the stress process that are theoretically linked to performance, as well as enhancing performance itself. This evidence has important implications for the physical training and psychological development of athletes. Yet, before coaches implement radical change in the sport training world, all tenative practical implications must be balanced by an appreciation of the methodological and theoretical limitations of the SMT program and the present study.

A major positive feature of the SMT program is that it provides a conceptual model of the stress process which athletes find intuitively appealing. The conceptual model is an important educational tool that aids in program compliance and possibly allows athletes to utilize already established coping skills (Meichenbaum, 1985) more effectively. The application of any intervention program, whether teaching athletes imagery, self-monitoring, or any other skill, should begin with a conceptual model or a conceptualization phase (Meichenbaum, 1985) that emphasizes and highlights how and why the skill will work.

The SMT program can be adapted to become integrated into the technical and physical training program to promote a holistic development of the athlete. The SMT conceptual model helps players to appreciate the integrated role of mental and physical skills in

ameliorating stress. Mental coping skills can be incorporated into the preparation stage for skill development, although well-engrained, properly executed skills may become disrupted if conscious processing is too intrusive (Shriffrin and Schneider, 1977). Relaxation strategies can be applied in practice to help regulate emotional arousal to facilitate decision making under stress. To recognize individual differences, athletes can "play around" with various cognitive-behavioral techniques, just like technical skills, in different practice contexts.

A major challenge facing all coaches is breaking traditional practice boundaries so that coping skills can be more readily acquired, developed, and applied in sport. Many technical practices are structured to optimize technical and physical skill development. Psychological training, if any, is often held during special sessions. This fragmented approach produces players with fragmented skills.

The present study clearly demonstrated that SMT enhanced skill performance beyond that attained by control subjects exposed to the "normal" physical training. If we expect players to use coping skills in game situations, those skills must be developed within a context that facilitates maximum transfer: that context is the practice session. The integration of coping skills training with technical skills training will lead to more "complete" player development. This is a challenge technical directors, university athletic directors, coaches and sport consultants must accept.

The final practical implication is that SMT can help athletes and coaches (Smith, 1986b) acquire coping skills to manage potentially distressing athletic situations. These coping skills can potentially generalize across situations to aid in managing predictable and unpredictable events in life. For example, one player reported using the coping skills to help reduce anxiety in preparing for school examinations (see also Nye, 1979). The coping skills may increase the athlete's general belief in influencing and controlling potentially controllable events (see

Folkman, 1984). Interventions that increase general internal control (Rotter, 1966), situational self-efficacy (Bandura, 1977), or perceived competence (Weiss, 1986) can only produce athletes who are more competent in sport and possibly make athletic competition more enjoyable.

E) Suggested future research

The present study provided evidence that SMT is an effective program to enable athletes to manage the stress process and enhance performance. However, the ability to generalize the findings of a single study to or across persons, settings, and time are limited (Campbell, 1987). Suggestions for future research will be advanced to strengthen the generalizability of the SMT program and to further our understanding of the factors involved in stress relationships in athletic settings.

The quasi-experimental design and methodology employed in the present study should be improved to increase the research validity without sacrificing the important applied considerations involved in any intervention program. Larger sample sizes would increase the probablity of establishing real treatment effects, with caution being extended towards distinguishing between statistically significant and practically significant differences (Stevens, 1986). Unfortunately, larger sample sizes are often unavailable in field settings without weakening clear population definition. Coupled with the need for larger sample sizes, future studies should also attempt to use random selection and assignment to increase protection against threats to validity (Cook and Campbell, 1979).

A major problem in research is the intrusion of method effects which threaten construct validity (Fiske, 1987). Theoretical conceptualizations and experimental research must clearly define the constructs of interest, their operationalization, and measurement. To gain a clearer understanding of the role of appraisal and coping in stress relationships, reliable and valid instruments must be developed to assess these constructs (Campbell, 1987; Fiske, 1987;

Folkman and Lazarus, 1985; Vallerand, 1987). Combined with improved instrumentation is a need for appropriate experimental methodology and statistical analysis. For example, to clearly establish the relationship between anxiety and performance, intra-individual analysis rather than inter-individual analysis is required (Gould, Petlichkoff, Simons, and Vevera, 1987).

Further replications and applications of SMT will help clarify the boundary conditions of its efficacy. It would be beneficial to apply SMT with younger athletic populations. Hypothetically, the younger the athlete acquires a coping skill correctly the more likely he/she will develop the skill and learn to generalize the skill to new situations. Further, the young athlete may not have developed maladaptive means of coping (Roskies and Lazarus, 1980) and the learning process will be far more efficient and effective. No doubt that some of the SMT components, like cognitive restructuring, will demand psychological maturity and will need to be modified. Other special adjustments to adapt to the special needs of a younger athletic population will need to be considered.

Cognitive-affective Stress Management Training should be examined against alternative stress reduction treatments that are appropriate to the athletic environment. One possible alternative is Stress Inoculation Training (Meichenbaum, 1985). Kazdin and Wilson (1978) have suggested, however, that outcome research should contrast treatments that minimize overlapping components (Long, 1984). Unfortunately, SIT and SMT are both coping skills programs with many component similarities.

A fruitful research enterprise would be a component analysis of SMT. Although Smith (1980a) argued that the goal of SMT is the development of an integrated coping response, the volleyball players stated a preference for specific components like progressive relaxation and self-talk. A component analysis may reveal that some components are more effective and may generalize more readily across contexts.

One feature that became apparent from this study is that more knowledge is needed about the role of coping in ameliorating stress in athletics. There is a growing literature in social psychology which is indicative of the importance of the mediating role of coping (see Folkman et al., 1986). Coping is influenced by personality charateristics (Fleishman, 1984), cognitive appraisal (Folkman et al., 1986), and contextual and situational factors (Folkman and Lazarus, 1980, 1985; Holahan and Moos, 1987; McCrae, 1984). This growing wealth of knowledge about coping processes is not matched in the sport psychology field. The majority of stress research in sport has been directed towards identifying situational factors, appraisal processes, and attributions rather than coping processes. There is a swelling literature on the role of game or match outcome (Scanlan and Passer; Septon and Wankel, 1987), the influence of coaches, peers, parents, and facilities (Gould et al., 1983; Gould et al., 1985; Smith et al., 1978), plus personal factors like perceived competence (Weiss, 1986), competitive trait anxiety (Scanlan, 1984), self-esteem, perceived control, and fear of failure (Passer, 1983; Scanlan and Lewthwaite, 1984; Scanlan and Passer, 1978, 1979).

The lack of coping research in sport is problematic. It is dangerous to assume coping in sport is similar to other life domains. Folkman and Lazarus (1980) found that people changed coping patterns from work to interpersonal situations. It is plausible that due to the unique social psychological and physiological factors involved in the sport setting, patterns of coping may be qualitatively different from other situations and may be different within various sporting competitive levels. The specfic patterns of coping, combined with the environmental conditions, will be a major determinant of the type of intervention program that will be most beneficial to the athlete.

It is very clear that stress is a very complex process involving transactions between cognitive appraisal, coping resources, personal and environmental factors. Further research is needed to clarify the dynamics of these transacting processes (Folkman et al., 1986).

Empirical research will lead to theoretical refinements and evolution of the role of cognitive appraisal processes, coping and affect (Vallerand, 1987). These theoretical advancements, along with clinical developments, should produce more effective intervention programs for athletes.

F) Conclusion

This was a controlled quasi-experimental-exploratory study that investigated the effectiveness of Cognitive-affective Stress Management Training (SMT) in an athletic setting. The matrix of outcome data from cognitive and performance [illegible] with the program evaluation questionnaire, provided converging evidence that SMT can help athletes control potentially stressful situations and enhance performance. Evidence that SMT is effective supports the need for more rigorous experimental studies to clarify the processes involved in effective stress management.

Findings that SMT is an effective intervention program with high performance youth volleyball players adds to the growing literature that coping skills training facilitates ameliorating the stress process. Adjunct research into Stress Inoculation Training (SIT) clearly supports the efficacy of the coping skills model (e.g., Deikis, 1983; Mace and Carroll, 1985; Meichenbaum, 1985; Smith, 1984; Zeigler et al., 1982). Findings from SIT research, coupled with the subjective reports by athletes in the present study, implies that stress management training should be diverse and flexible. Current research in social psychology (e.g., Folkman et al., 1986; Holahan and Moos, 1987) imply that stress management programs must carefully consider the complexity of coping mechanisms in the transactional process. Since coping is neither a single unitary mechanism nor static (Folkman and Lazarus, 1985; Meichenbaum, 1985), researchers and clinicians must advance the knowledge of effective coping in athletic settings.

Table 1

Cell means and standard deviations for affective measures for male and female experimental (SMT) and control (CON) subjects at pretreatment and posttreatment.

GROUP	TIME	SCAT		CSAI-cog		CSAI-som		CSAI-sc	
		m	sd	m	sd	m	sd	m	sd
SMT-M	PRE	17.4	3.7	13.1	3.1	12.4	3.0	29.4	4.4
	POST	16.6	2.7	13.8	2.1	12.1	2.4	29.8	6.2
SMT-F	PRE	18.2	4.1	20.0	7.1	18.3	7.0	23.8	5.0
	POST	18.3	4.4	17.9	5.6	15.0	5.5	25.2	5.5
CON-M	PRE	15.6	5.0	14.5	4.1	12.5	4.3	28.7	4.9
	POST	17.3	4.9	13.7	4.5	12.8	4.2	29.2	5.5
CON-F	PRE	15.4	5.6	15.2	6.9	14.0	6.2	28.0	5.4
	POST	15.0	4.8	14.2	5.8	13.6	7.4	31.8	4.0

m= mean, sd= standard deviation

Table 2

Cell means and standard deviations for thought listing for male and female experimental (SMT) and control (CON) subjects at pretreatment and posttreatment.

GROUP	TIME	PT1		PT2		NT1		NT2	
		m	sd	m	sd	m	sd	m	sd
SMT-M	PRE	52.8	21.5	16.4	20.6	35.5	21.5	71.0	26.4
	POST	42.4	31.7	15.6	14.9	44.9	25.7	61.3	28.0
SMT-F	PRE	30.1	23.8	13.4	17.8	48.8	23.6	72.8	35.6
	POST	49.0	24.9	30.6	18.5	22.6	12.4	43.6	26.0
CON-M	PRE	49.2	29.0	13.0	14.8	27.7	38.9	68.0	28.9
	POST	47.0	34.0	09.7	15.2	44.2	34.4	75.0	28.1
CON-F	PRE	42.0	30.5	05.0	11.2	38.0	23.8	85.6	15.8
	POST	42.0	30.5	05.0	11.2	43.6	10.4	82.2	14.4

PT1= positive thoughts to scene 1, PT2= positive thoughts to scene 2,
NT1= negative thoughts to scene 1, NT2= negative thoughts to scene 2
m= mean, sd= standard deviation

Table 3

Cell means and standard deviations for general self-efficacy and service reception performance for male and female experimental (SMT) and control (CON) subjects at pretreatment and posttreatment.

Group	TIME	SELF-EFFICACY		PERFORMANCE	
		m	sd	m	sd
SMT-M	PRE	85.5	12.0	25.5	3.5
	POST	88.3	09.5	33.6	5.5
SMT-F	PRE	79.8	08.2	27.3	4.1
	POST	80.3	11.1	39.0	2.4
CON-M	PRE	85.3	18.3	26.5	6.0
	POST	86.3	18.4	28.2	7.0
CON-F	PRE	82.2	18.0	31.0	4.9
	POST	80.8	13.2	31.0	4.9

m= mean, sd=standard deviation

Table 4

Correlation matrix for all dependent measures at pretreatment.

SCAT	COG	SOM	SC	SELF	PT1	PT2	NT1	NT2	
COG	.64**								
SOM	.67**	.72**							
SC	-.50**	-.82**	-.71**						
SELF	-.40*	-.43*	-.38*	.59**					
PT1	-.55**	-.61**	-.48**	.72**	.60**				
PT2	-.35*	-.47**	-.23	.34*	.32*	.34			
NT1	.68**	.65**	.53**	-.61**	-.58**	-.80**	-.53**		
NT2	.47**	.43**	.29	-.32*	-.55**	-.25	-.79**	.47**	
PERF	-.03	-.03	-.01	.16	.26	.15	-.30	-.14	.25

** p<.01 *p<.05

Cog= CSAI-cog, Som= CSAI-som, Sc= CSAI-sc, Self= Self-efficacy, PT1= positive thoughts to scene 1, PT2= positive thoughts to scene 2, NT1= negative thoughts to scene 1, NT2= negative thoughts to scene 2, Perf= service reception performance.

Table 5

Correlation matrix for all dependent measures at posttreatment.

SCAT	COG	SOM	SC	SELF	PT1	PT2	NT1	NT2	
COG	.55**								
SOM	.68**	.48**							
SC	-.42*	-.61**	-.33*						
SELF	-.32*	-.38*	-.26	.49**					
PT1	-.30	-.27	-.22	.22	.53**				
PT2	-.01	-.03	-.16	-.29	.00	.12			
NT1	.32*	.19	.19	-.11	-.38*	-.82**	-.31		
NT2	-.03	.07	.15	.09	-.27	-.27	-.78**	.44**	
PERF	-.09	-.01	-.27	-.05	.06	.04	.33*	-.20	-.52**

** p<.01 *p<.05

Cog= CSAI-cog, Som= CSAI-som, Sc= CSAI-sc, Self= Self-efficacy, PT1= positive thoughts to scene 1, PT2= positive thoughts to scene 2, NT1= negative thoughts to scene 1, NT2= negative thoughts to scene 2, Perf= service reception performance.

Table 6

Summary of significant effects and violations of assumptions for ANCOVA at posttreatment.

Measure	Effect			Linearity of Regression	Homogeneity of Regression
	TRT	SEX	TRT by SEX		
SCAT	-	-	YES	YES	YES
CSAI-COG	-	-	-	YES	YES
CSAI-SOM	-	-	-	YES	YES
CSAI-SC	-	-	-	YES	YES
SELF	-	-	-	YES	YES
PT1	-	-	-	YES	YES
PT2	YES	-	-	NO*	NO*
NT1	YES	YES	-	YES	YES
NT2	YES	-	-	YES	YES
PERF	YES	YES	-	YES	NO*

*- Violates ANCOVA assumptions
SELF= SELF-EFFICACY, PT1= POSITIVE THOUGHTS TO SCENE 1,
PT2= POSITIVE THOUGHTS TO SCENE 2, NT1= NEGATIVE THOUGHTS TO SCENE 1,
NT2= NEGATIVE THOUGHTS TO SCENE 2, PERF= SERVICE RECEPTION PERFORMANCE

Table 7

Summary of ANCOVA output at posttreatment.

MEASURE	EFFECT	DF	MS	F	P
SCAT	TRT	1, 22	1.8	.38	.54
	SEX	1, 22	2.3	.48	.50
	TRT BY SEX	1, 22	15.0	3.13	.09
PT1	TRT	1, 22	285.4	.48	.49
	SEX	1, 22	268.6	.49	.49
	TRT BY SEX	1, 22	1131.4	1.91	.18
NT1	TRT	1, 22	1393.5	4.04	.05
	SEX	1, 22	1876.2	5.44	.03
	TRT BY SEX	1, 22	870.5	2.52	.13
NT2	TRT	1, 22	3749.2	6.97	.02
	SEX	1, 22	529.9	.99	.33
	TRT BY SEX	1, 22	532.8	.99	.33
CSAI-COG	TRT	1, 22	2.4	.50	.49
	SEX	1, 22	1.2	.24	.63
	TRT BY SEX	1, 22	1.3	.27	.61
CSAI-SOM	TRT	1, 22	6.1	.48	.48
	SEX	1, 22	1.9	.15	.71
	TRT BY SEX	1, 22	.8	.06	.80
CSAI-SC	TRT	1, 22	17.7	.96	.39
	SEX	1, 22	10.9	.59	.45
	TRT BY SEX	1, 22	18.5	1.00	.33
SELF	TRT	1, 22	16.3	.33	.57
	SEX	1, 22	67.0	1.34	.26
	TRT BY SEX	1, 22	.3	.01	.94

PT1= positive thoughts to scene 1, NT= negative thoughts to scene1
NT2= negative thoughts to scene 2, SELF= self-efficacy

Table 8

Summary of repeated measures output for pretreatment and posttreatment results

MEASURE	EFFECT	DF	MS	F	P
PT2	TRT	1, 23	1522.5	4.44	.05
	SEX	1, 23	.4	0.0	.97
	TRT BY SEX	1, 23	493.3	1.44	.24
	TIMES	1, 23	140.6	.72	.40
	TRT BY TIMES	1, 23	318.9	1.64	.21
	SEX BY TIMES	1, 23	369.0	1.90	.18
	TRT BY TIMES BY SEX	1, 23	174.4	.90	.35
PERF	TRT	1, 23	32.3	.88	.36
	SEX	1, 23	230.4	6.31	.02
	TRT BY SEX	1, 23	5.5	.15	.70
	TIMES	1, 23	464.8	39.8	.001
	TRT BY TIMES	1, 23	202.6	17.4	.001
	SEX BY TIMES	1, 23	15.4	1.3	.26
	TRT BY SEX BY TIMES	1, 23	6.8	.6	.45

TRT= TREATMENT ; PT2= POSITIVE THOUGHTS TO SCENE 2; PERF=-SERVICE RECEPTION PERFORMANCE

Table 9

Summary of repeated measures ANOVA output for affective and performance measures at pretreatment, posttreatment and follow-up for treatment males and females.

MEASURE	EFFECT	DF	MS	F	P
SCAT	SEX	1, 13	1.5	0.04	.84
	TIMES	2, 26	1.3	0.40	.68
	SEX BY TIMES	2, 26	8.0	2.45	.10
CSAI-cog	SEX	1, 11	191.5	3.85	.08
	TIMES	2, 22	54.7	7.15	.004
	SEX BY TIMES	2, 22	34.8	4.55	.02
CSAI-som	SEX	1, 11	101.6	3.40	.09
	TIMES	2, 22	60.3	4.66	.02
	SEX BY TIMES	2, 22	47.4	3.66	.04
CSAI-sc	SEX	1, 11	230.2	4.61	.06
	TIMES	2, 22	65.3	6.56	.006
	SEX BY TIMES	2, 22	30.4	3.05	.07
PERFORMANCE	SEX	1, 11	155.1	8.36	.02
	TIMES	2, 22	357.6	17.15	.001
	SEX BY TIMES	2, 22	22.5	1.08	.36

Table 10

Summary of repeated measures ANOVA output for thought-listing and self-efficacy measures at pretreatment, posttreatment and follow-up for treatment males and females.

MEASURE	EFFECT	DF	MS	F	P
PT1	SEX	1, 13	8.8	0.01	.93
	TIMES	2, 26	1498.5	3.13	.06
	SEX BY TIMES	2, 26	2117.0	4.4	.02
NT1	SEX	1, 13	1122.7	1.20	.29
	TIMES	2, 26	536.6	1.92	.17
	SEX BY TIMES	2, 26	1388.5	4.96	.02
PT2	SEX	1, 13	2476.2	7.07	.02
	TIMES	2, 26	452.1	1.20	.32
	SEX BY TIMES	2, 26	563.2	1.50	.24
NT2	SEX	1, 13	3058.0	3.18	.10
	TIMES	2, 26	1472.4	1.58	.22
	SEX BY TIMES	2, 26	724.1	0.78	.47
SELF	SEX	1, 13	626.0	2.24	.16
	TIMES	2, 26	4.1	0.11	.90
	SEX BY TIMES	2, 26	1.4	0.04	.96

PT1= POSITIVE THOUGHTS TO SCENE 1; NT1= NEGATIVE THOUGHTS TO SCENE 1;
PT2= POSITIVE THOUGHTS TO SCENE 2; NT1= NEGATIVE THOUGHTS TO SCENE 2;
SELF= SELF-EFFICACY

Table 11

Cell means and standard deviations for affective measures for male and female experimental (SMT) subjects at pretreatment, posttreatment, and follow-up.

GROUP	TIME	SCAT		CSAI-cog		CSAI-som		CSAI-sc	
		m	sd	m	sd	m	sd	m	sd
	PRE	17.6	4.0	13.3	3.6	12.7	3.1	29.5	5.2
SMT-M	POST	16.6	2.9	13.7	2.4	12.2	2.7	31.5	4.2
	F.U.	18.0	3.8	12.7	3.1	12.2	2.9	31.3	3.6
		m	sd	m	sd	m	sd	m	sd
	PRE	18.3	4.1	20.7	7.3	19.6	6.5	22.9	4.6
SMT-F	POST	18.3	4.4	18.7	5.5	15.7	5.5	24.0	5.8
	F.U.	16.8	2.8	19.6	3.3	14.4	3.1	30.0	5.0

PRE= pretreatment, POST= posttreatment, F.U.= follow-up

m= mean, sd= standard deviation

Table 12

Cell means and standard deviations for thought-listing measures for male and female experimental (SMT) subjects at pretreatment, posttreatment, and follow-up.

GROUP	TIME	PT1		PT2		NT1		NT2	
		m	sd	m	sd	m	sd	m	sd
	PRE	53.1	23.2	11.5	16.8	37.0	22.7	74.0	30.0
SMT-M	POST	48.1	28.8	14.0	17.8	39.4	22.2	63.4	29.5
	F.U.	49.1	33.5	08.6	16.7	47.9	33.5	77.1	40.7
		m	sd	m	sd	m	sd	m	sd
	PRE	30.1	23.8	13.4	15.2	48.8	23.5	72.8	35.6
SMT-F	POST	49.5	24.9	30.7	18.5	22.6	12.4	43.6	26.0
	F.U.	73.8	21.8	34.8	18.5	22.9	14.6	48.6	22.3

PRE= pretreatment, POST= posttreatment, F.U.= follow-up

m= mean, sd= standard deviation

PT1= positive thoughts to scene 1, PT2= positive thoughts to scene 2, NT1= negative thoughts to scene 1, NT2= negative thoughts to scene 2.

Table 13

Cell means and standard deviations for general self-efficacy and service reception performance for male and female experimental (SMT) subjects at pretreatment, posttreatment, and follow-up.

GROUP	TIME	SELF-EFFICACY		PERFORMANCE	
		m	sd	m	sd
	PRE	88.4	10,3	26.7	3.3
SMT-M	POST	87.0	12.1	33.0	6.3
	F.U.	87.0	11.6	34.3	4.8
		m	sd	m	sd
	PRE	80.3	11.1	27.9	4.1
SMT-F	POST	79.7	08.2	39.4	2.2
	F.U.	80.0	11.8	38.7	5.3

PRE= pretreatment, POST= posttreatment, F.U.= follow-up

m= mean, sd=standard deviation

Table 14

Summary of ANOVA output of CSAI-II scores for males from the National Challenge Cup

MEASURE	EFFECT	DF	MS	F	P
CSAI-sc	TRT	1, 9	7.43	0.28	.61
	GAMES	1, 36	16.96	5.60	.001
	TRT BY GAMES	1, 36	2.78	0.92	.47
CSAI-cog	TRT	1, 9	134.43	4.64	.06
	GAMES	1, 36	5.34	1.12	.36
	TRT BY GAMES	1, 36	2.28	0.48	.75
CSAI-som	TRT	1, 9	88.42	2.31	.16
	GAMES	1, 36	6.76	1.81	.15
	TRT BY GAMES	1, 36	2.61	0.70	.60

Table 15

Summary of ANOVA output of CSAI-II scores for females from the National Challenge Cup

MEASURE	EFFECT	DF	MS	F	P
CSAI-cog	TRT	1, 10	42.01	0.47	.51
	GAMES	1, 40	17.28	2.63	.05
	TRT BY GAMES	1, 40	3.72	0.57	.69
CSAI-som	TRT	1, 10	145.20	3.13	.11
	GAMES	1, 40	19.35	2.81	.03
	TRT BY GAMES	1, 40	20.01	2.90	.03
CSAI-sc	TRT	1, 10	180.30	1.43	.26
	GAMES	1, 40	11.74	1.35	.27
	TRT BY GAMES	1, 40	11.47	1.32	.28

Table 16

Cell means and standard deviations for CSAI-II subscales for male experimental (SMT) and control subjects (CON) over five matches at the National Challenge Cup

MEASURE	GRP	G1		G2		G3		G4		G5	
		m	sd	m	sd	m	sd	m	sd	m	sd
CSAI-cog	SMT	14.6	3.0	15.6	2.8	16.7	4.9	14.4	2.5	16.7	3.7
	CON	12.8	2.6	12.3	1.0	12.5	1.3	11.5	3.0	12.8	2.1
CSAI-som	SMT	14.1	3.8	15.1	2.0	13.7	4.2	13.1	4.2	14.3	3.9
	CON	11.8	2.5	12.5	2.4	12.5	2.4	10.3	1.3	10.3	1.5
CSAI-sc	SMT	31.6	3.2	30.7	2.6	31.0	3.6	32.9	2.7	31.3	3.4
	CON	31.5	1.7	31.0	1.4	31.0	2.9	35.3	1.0	32.5	3.1

GRP= group, G= matches

m= mean, sd= standard deviation

Table 17

Cell means and standard deviations for CSAI-II subscales for female experimental (SMT) and control subjects (CON) over five matches at the National Challenge Cup

MEASURE	GRP	G1		G2		G3		G4		G5	
		m	sd	m	sd	m	sd	m	sd	m	sd
CSAI-cog	SMT	18.9	5.7	17.4	5.3	17.6	4.3	16.6	4.6	15.6	4.2
	CON	17.8	3.9	16.0	5.4	13.8	4.0	15.5	4.7	14.3	5.1
CSAI-som	SMT	18.4	4.5	13.0	3.4	16.9	5.4	13.3	3.1	13.8	3.5
	CON	11.8	3.4	10.8	2.4	11.8	3.2	13.8	4.3	10.8	2.4
CSAI-sc	SMT	23.9	5.3	26.8	4.1	26.4	5.2	27.2	6.1	28.0	6.0
	CON	30.0	3.7	30.5	4.9	31.2	7.6	27.8	7.1	31.0	6.9

GRP= group, G= matches

m= mean, sd= standard deviation

Table 18

Pearson correlations between CSAI-II subscales for females within each match at the National Challenge Cup.

Match 1	CSAI-cog	CSAI-som	CSAI-sc
CSAI-cog			
CSAI-som	+.54*		
CSAI-sc	-.51*	-.67**	

Match 2	CSAI-cog	CSAI-som	CSAI-sc
CSAI-cog			
CSAI-som	+.77***		
CSAI-sc	-.49**	-.39	

Match 3	CSAI-cog	CSAI-som	CSAI-sc
CSAI-cog			
CSAI-som	+.64**		
CSAI-sc	-.82***	-.68**	

Match 4	CSAI-cog	CSAI-som	CSAI-sc
CSAI-cog			
CSAI-som	+.77***		
CSAI-sc	-.82***	-.80***	

Match 5	CSAI-cog	CSAI-som	CSAI-sc
CSAI-cog			
CSAI-som	+.52*		
CSAI-sc	-.45	-.63**	

* p<.01 ** p<.05 ***p<.01

Table 19

Pearson correlations between CSAI-II subscales for males within each match at the National Challenge Cup.

Match 1	CSAI-cog	CSAI-som	CSAI-sc
CSAI-cog			
CSAI-som	-.38		
CSAI-sc	+.56*	-.80**	

Match 2	CSAI-cog	CSAI-som	CSAI-sc
CSAI-cog			
CSAI-som	+.31		
CSAI-sc	-.11	-.23	

Match 3	CSAI-cog	CSAI-som	CSAI-sc
CSAI-cog			
CSAI-som	+.15		
CSAI-sc	+.13	-.31	

Match 4	CSAI-cog	CSAI-som	CSAI-sc
CSAI-cog			
CSAI-som	-.08		
CSAI-sc	-.42	-.52*	

Match 5	CSAI-cog	CSAI-som	CSAI-sc
CSAI-cog			
CSAI-som	+.14		
CSAI-sc	-.42	-.49	

* p<.01, ** p<.05 ***p<.01

Table 20

Group means and standard deviations for male and female experimental (SMT) and control (CON) groups for responses to the first five questions on the ancillary questionnaire at pretreatment.

GRP	Years		Previous		Ability		Performance		Stress	
Group	m	sd	m	sd	m	sd	m	sd	m	sd
SMT-M (n=8)	4.5	1.3	1.0	1.1	1.8	0.8	0.7	0.2	21.1	7.8
SMT-F (n=7)	2.8	0.9	1.2	0.5	3.1	0.7	0.7	0.3	22.9	13.8
CON-M (n=6)	4.0	1.6	0.7	0.5	2.5	0.5	1.2	0.2	23.3	29.4
CON-F (n=5)	4.2	1.6	1.8	1.3	2.0	1.0	1.0	0.0	20.6	19.2

m= mean, sd= standard deviation
Years= years of competitive club play;
Previous= previous provincial team representation;
Ability= ranked ability relative to teammates (1= top 10%, 2= top 30%, 3= middle 40%, 4= bottom 30%, 5= bottom 10%);
Performance= perception of performance in important matches (2= well above average, 1= above average, 0= average, -1 below average, -2 well below average);
Stress= how much stress interfered with performance (0-100%).

Table 21

Frequency and intensity of volleyball stressors experienced by female and male players reported on the ancillary questionnaire.

Type of stressor	Females (n=12)		Males (n=14)	
	TS	MI	TS	MI
Personal performance	39	5.0	38	5.5
Team performance	02	6.5	05	5.7
Personal attitude	01	2.0	06	4.6
Team Attitude	03	8.3	11	6.9
Coach	01	6.0	05	4.9
Referee	02	4.0	03	8.0
Communication	01	9.0	05	4.7

TS= total number of stressors reported by group

MI= mean intensity of reported stressor (1=none to 10=extreme)

Table 22

Categorization of male and female players preferred ways of coping with stressful volleyball situations reported on the ancillary questionnaire at pretreatment.

Category	No. of female responses	No. of male responses	Total responses
Relaxation/Breathing	6	5	11
Positive Imagery	6	3	9
General self-talk	7	3	10
Specific self-talk	3	-	3
Concentration	5	5	10
Social Support	1	3	4
Blocking-out thoughts	-	3	3
Withdrawl/Avoidance	-	5	5
Humour	-	2	2
Reappraisal	-	1	1

Table 23

Number of male and female treatment subjects' responses to the degree of effectiveness for individual coping strategies from program evaluation questionnaire

Strategy	Gender	Effectiveness			
		not at all	somewhat	moderately so	very much so
Progressive relaxation	M	-	-	3	2
	F	-	-	5	3
Irrational beliefs	M	1	3	2	-
	F	-	6	1	1
General self-talk	M	-	-	2	3
	F	-	1	1	6
Skill specific self-talk	M	-	1	4	-
	F	-	-	5	3
Integrated coping response	M	-	3	2	-
	F	2	3	3	-
Meditation	M	1	2	2	-
	F	2	4	1	1

M= Males (n=5) ; F=Females (n=8)

Table 24

Number of male and female treatment subjects' responses to compliance with practicing the different components of the SMT program from program evaluation questionnaire.

Component	Gender	Amount of Practice						
		A	B	C	D	E	F	G
Progressive relaxation	M	3	-	1	1	-	-	-
	F	2	3	3	-	-	-	-
Irrational beliefs	M	-	-	3	-	1	2	-
	F	1	1	1	-	1	1	3
General self-talk	M	2	3	-	-	-	-	-
	F	2	5	1	-	-	-	-
Skill specific self-talk	M	-	4	1	-	-	-	-
	F	3	3	1	1	-	-	-
Integrated coping response	M	-	-	3	-	1	1	-
	F	-	1	3	3	-	6	
Meditation	M	-	-	-	-	2	2	1
	F	-	2	-	1	1	1	3

A= more than once/day; B= Once/day; C= Twice/week; D= Once/week
E= once/two weeks; F= Once/month; G= Never

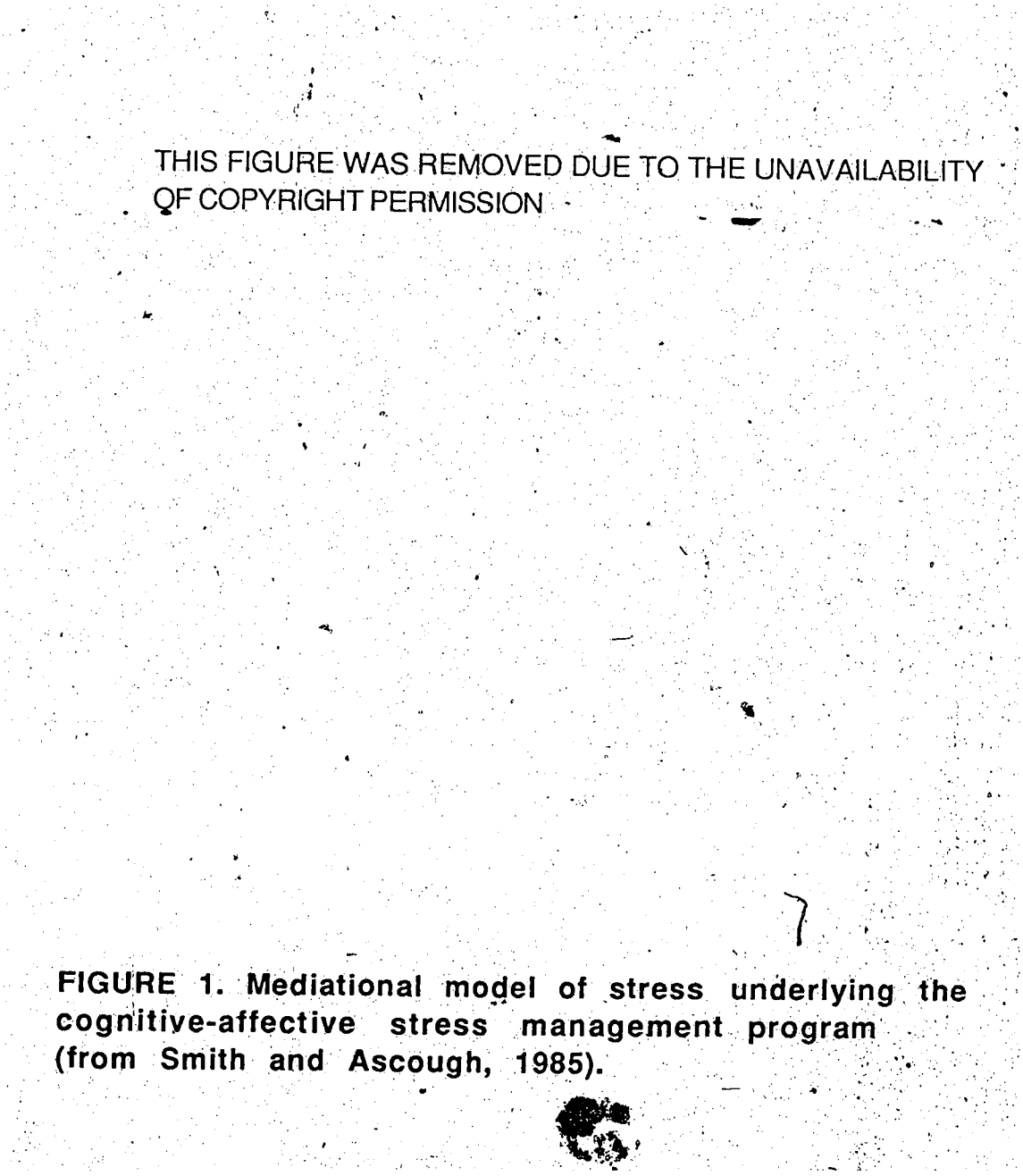

FIGURE 1. Mediational model of stress underlying the cognitive-affective stress management program (from Smith and Ascough, 1985).

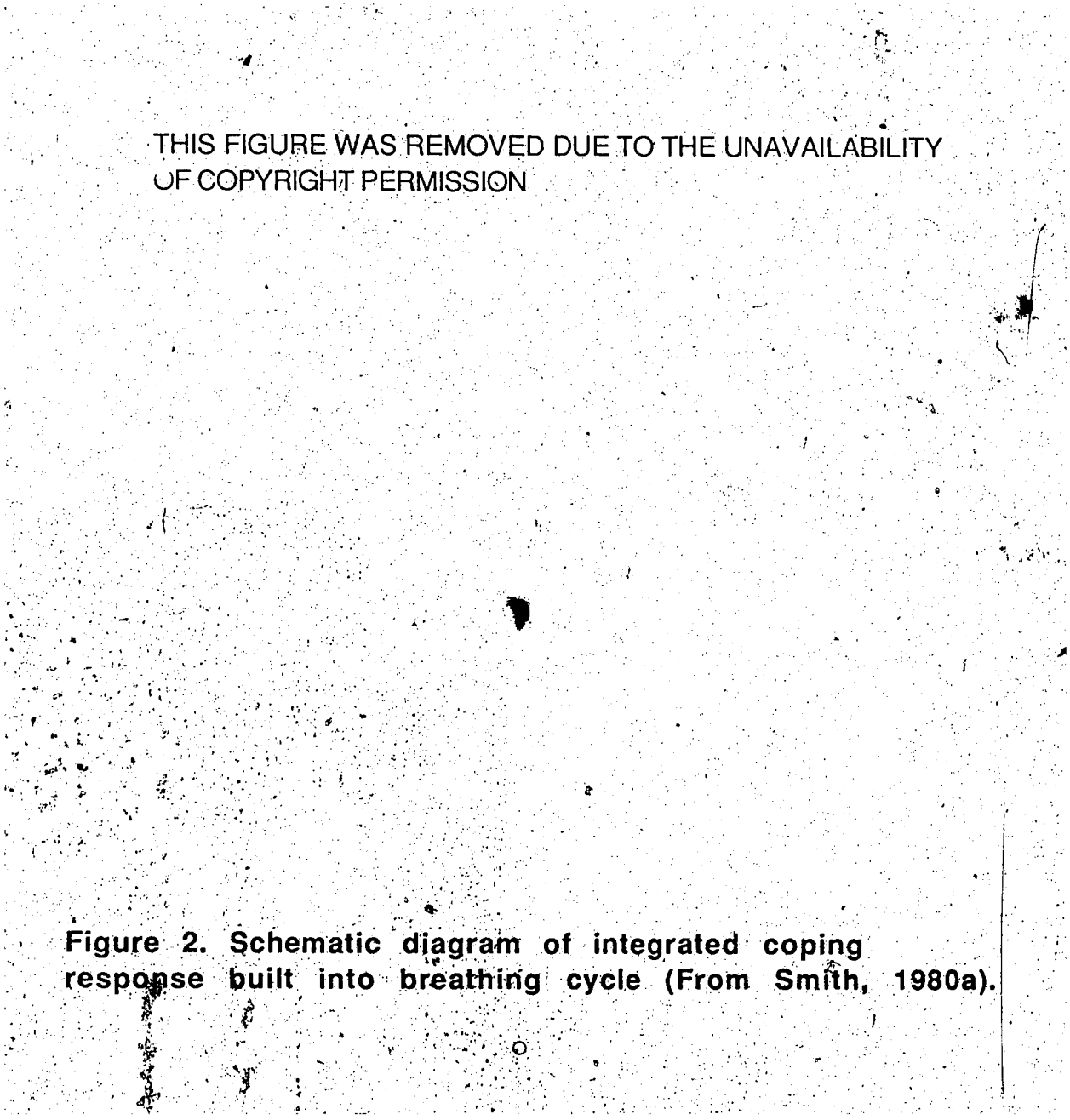

Figure 2. Schematic diagram of integrated coping response built into breathing cycle (From Smith, 1980a).

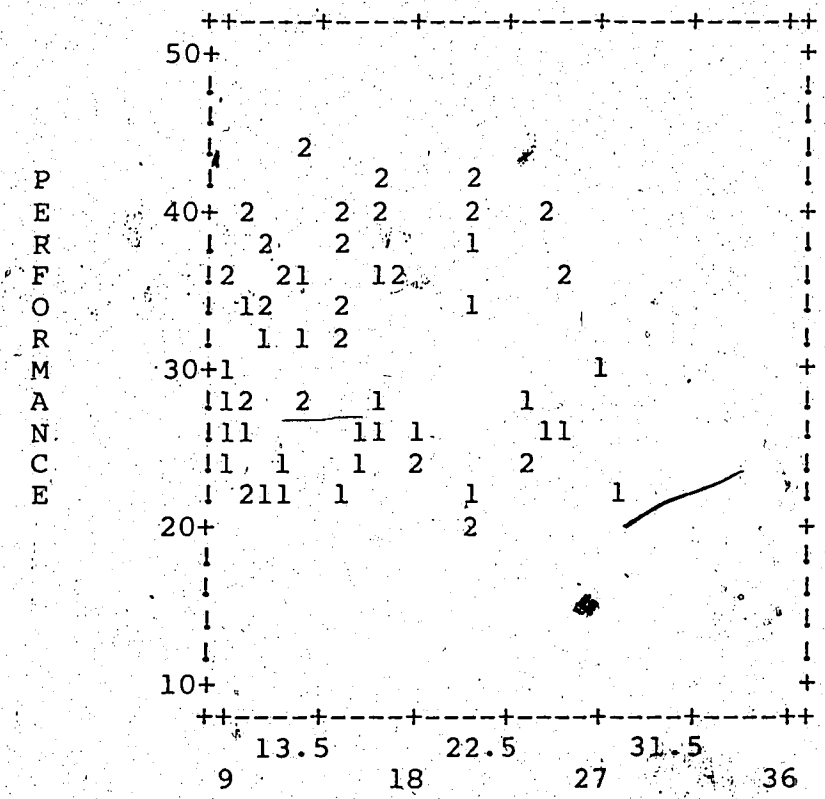

Figure 3. Overlay plot of service reception performance and precompetitive cognitive anxiety for all subjects at pretreatment and posttreatment.

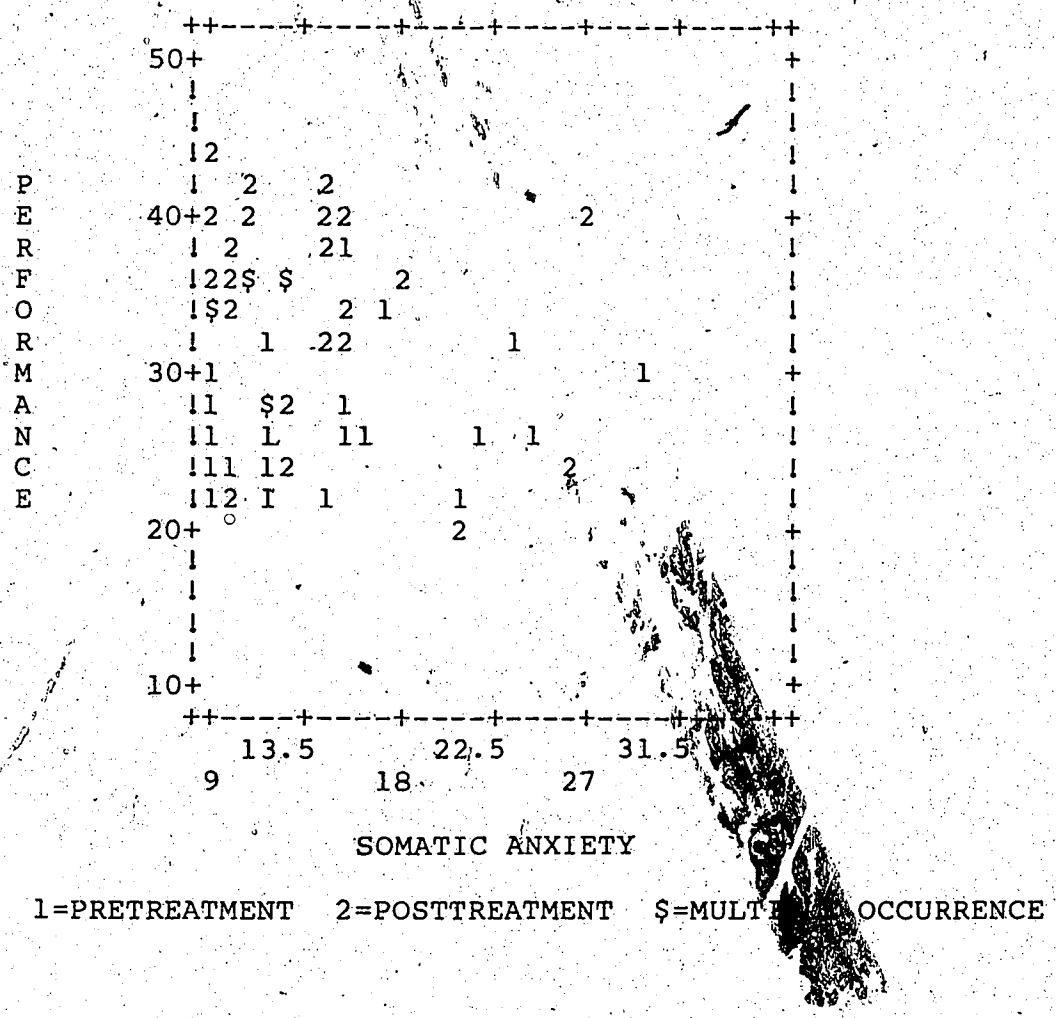

Figure 4. Overlay plot of service reception performance and precompetitive somatic anxiety for all subjects at pretreatment and posttreatment.

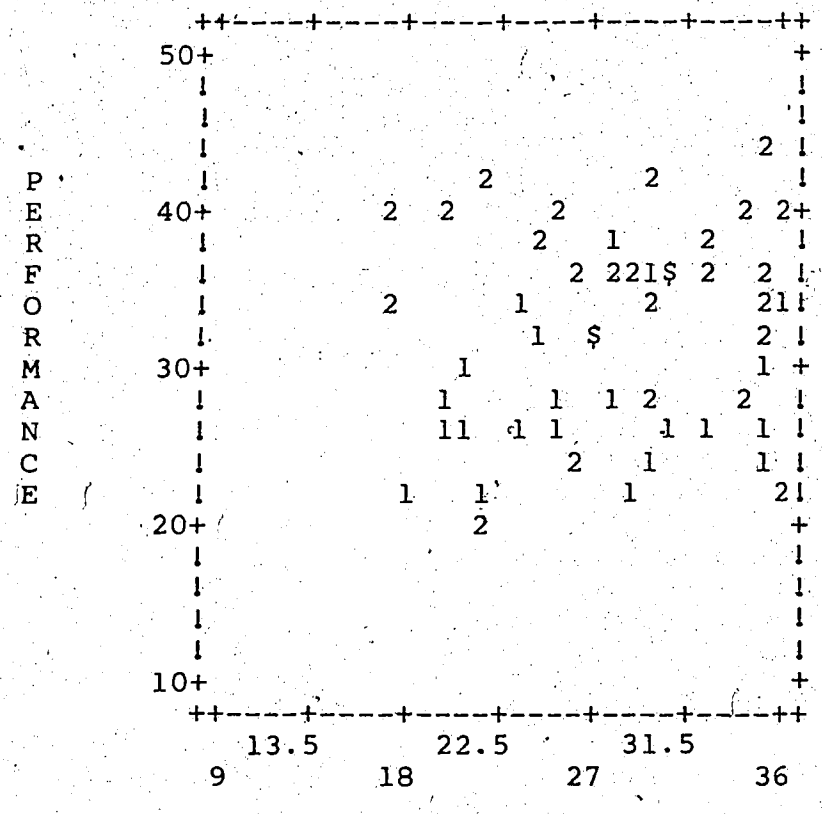

Figure 5. Overlay plot of service reception performance and precompetitive self-confidence for all subjects at pretreatment and posttreatment.

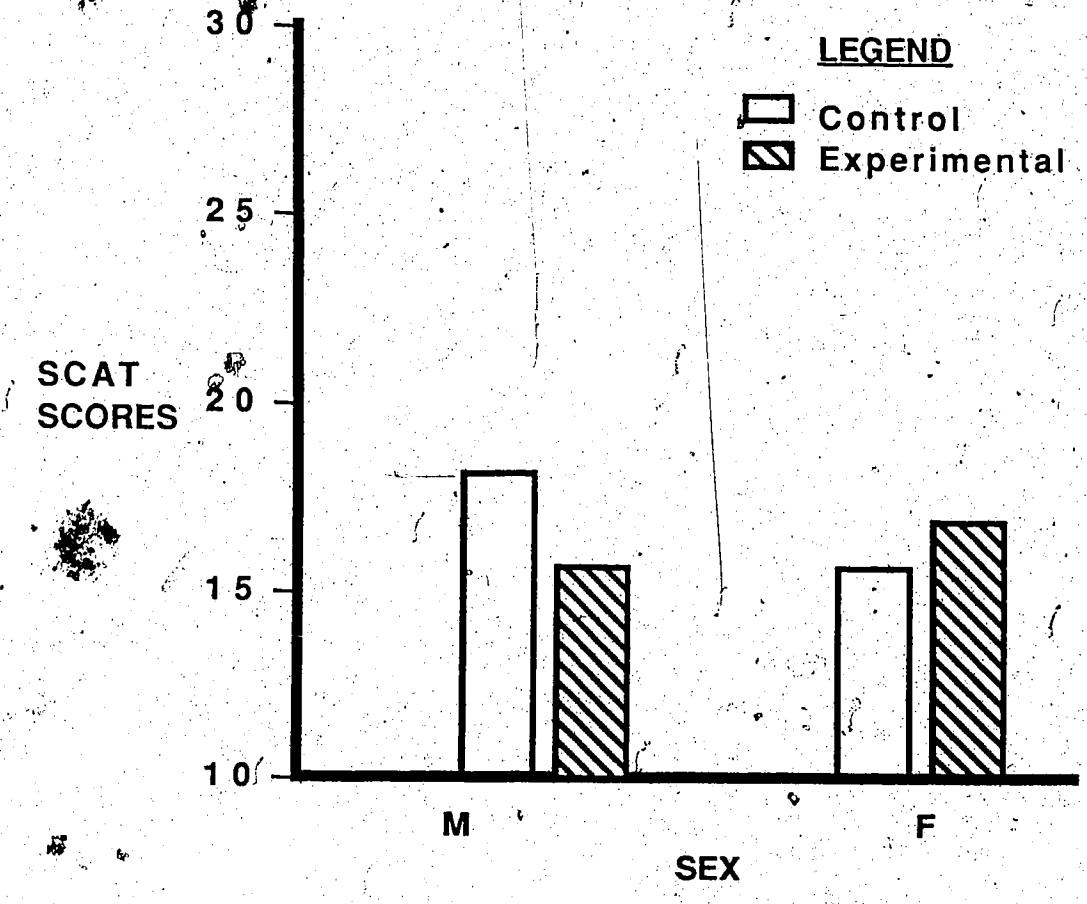

Figure 6. Adjusted SCAT cell means for male and female subjects for control and experimental groups at posttreatment.

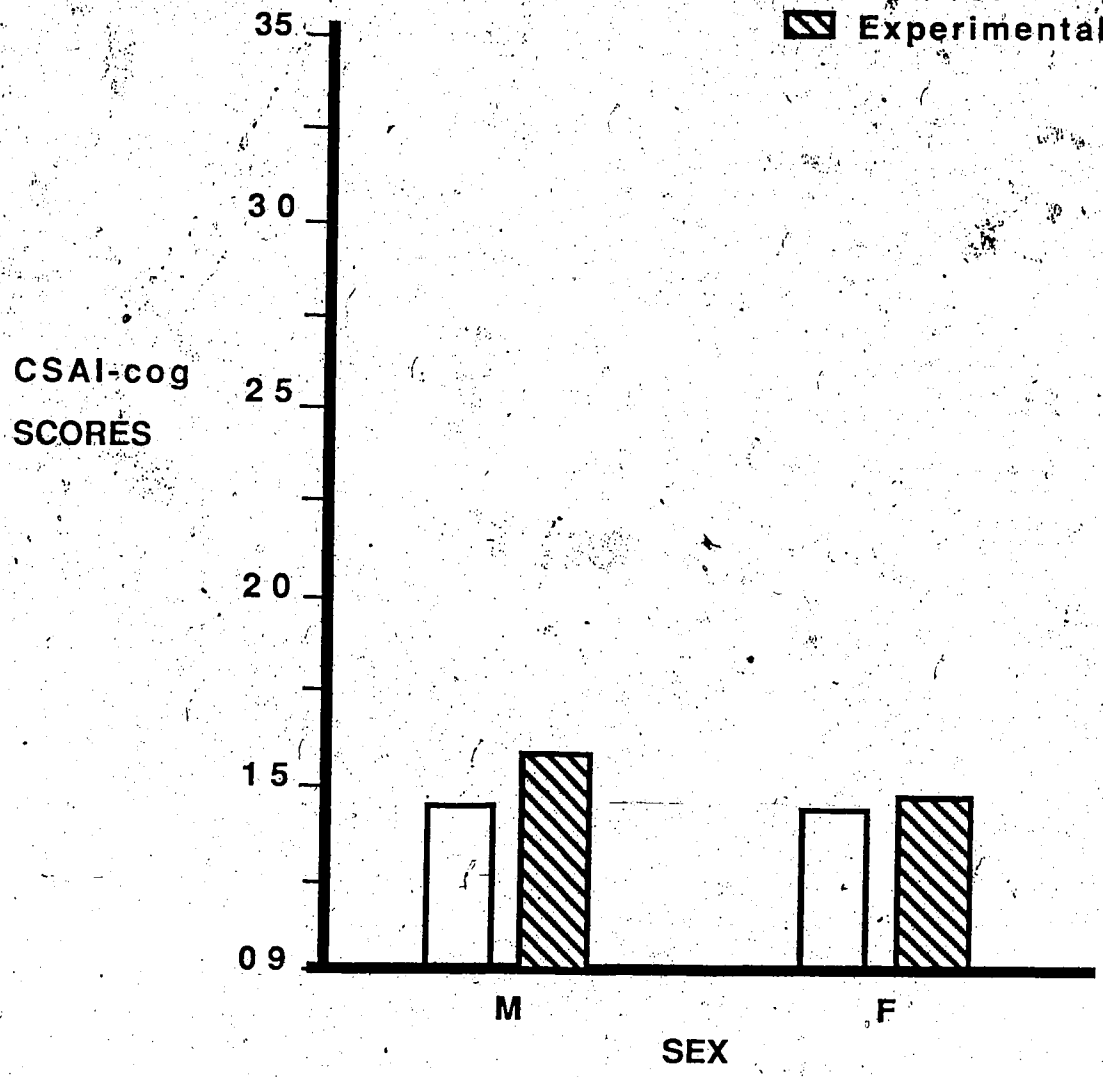

Figure 7. Adjusted CSAI-cog cell means for male and female subjects in control and experimental groups at posttreatment.

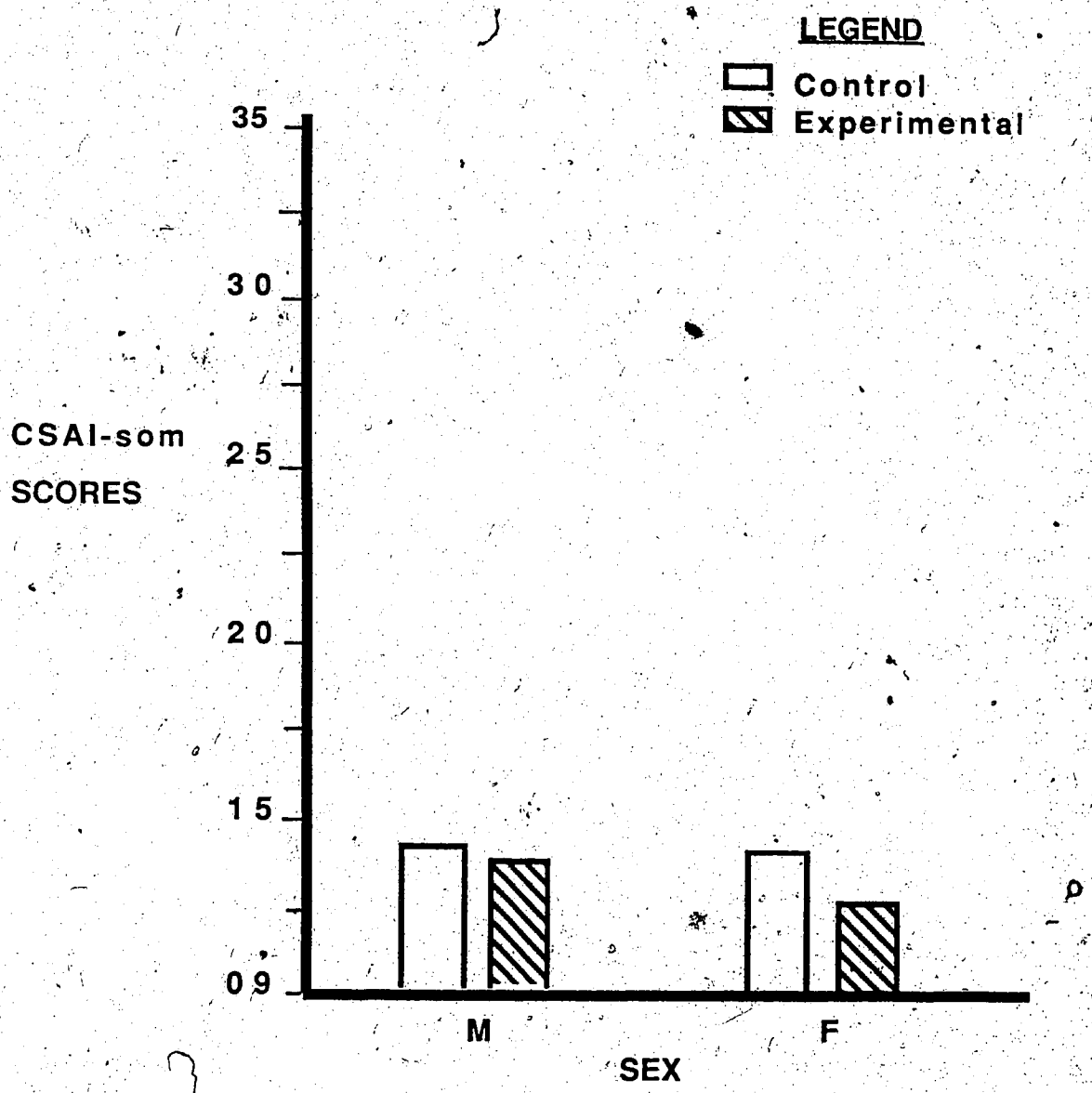

Figure 8. Adjusted CSAI-som cell m[illegible]male and female subjects in control and exp[illegible] groups at posttreatment.

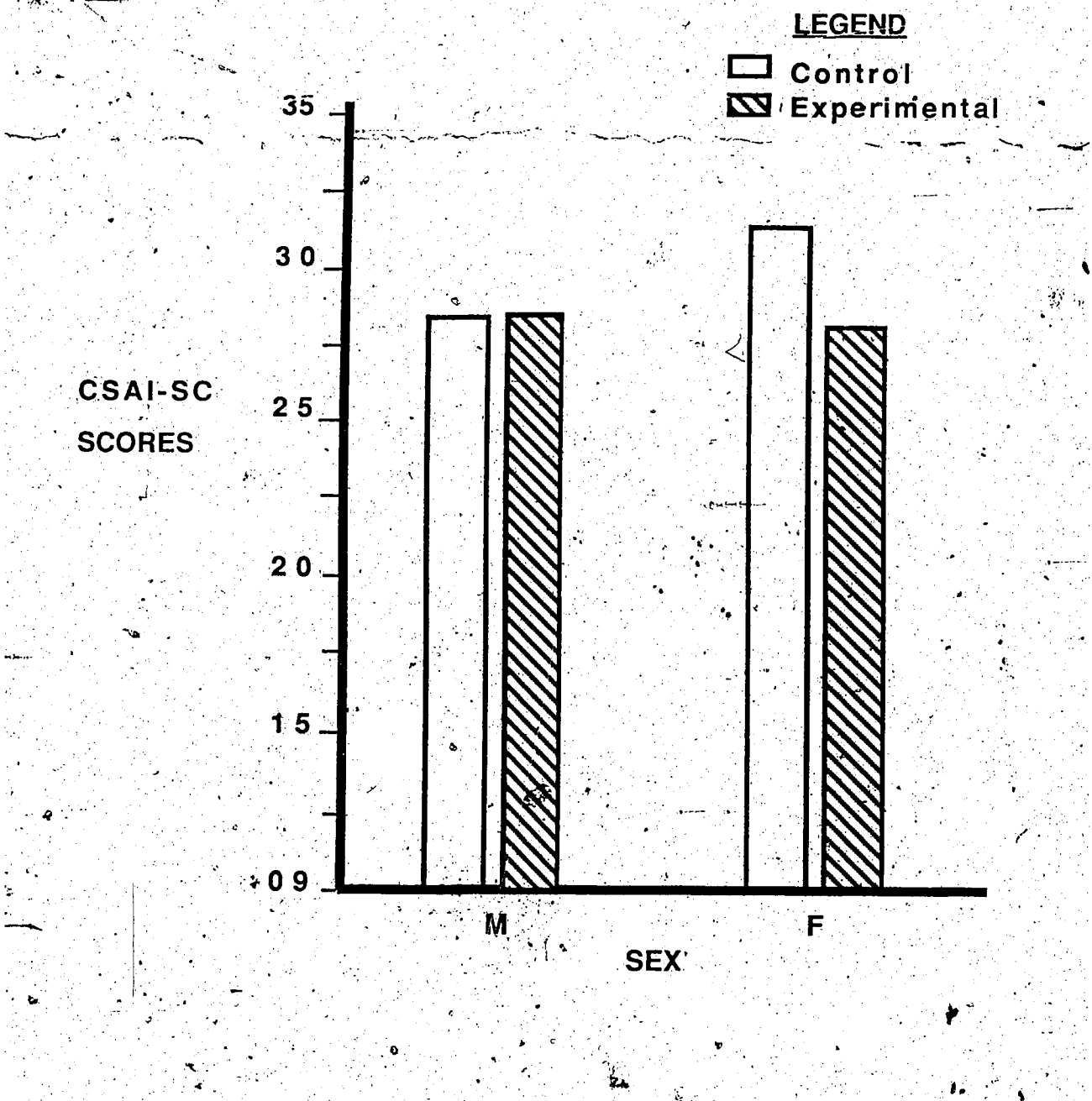

Figure 9: Adjusted CSAI-sc cell means for male and female subjects in control and experimental groups at posttest.

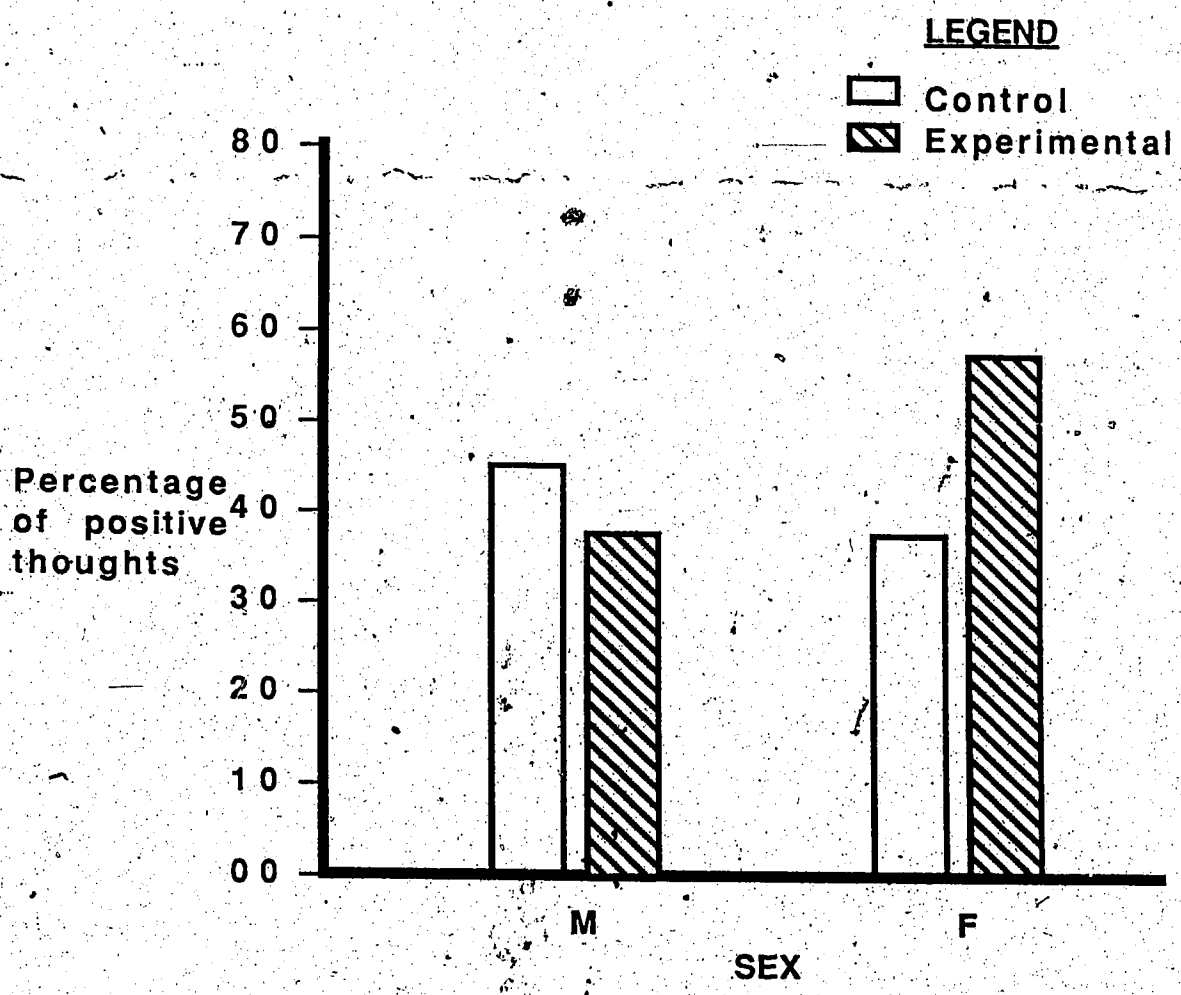

Figure 10. Adjusted cell means of percentage of positive thoughts to scene 1 for male and female subjects in control and experimental groups at posttest.

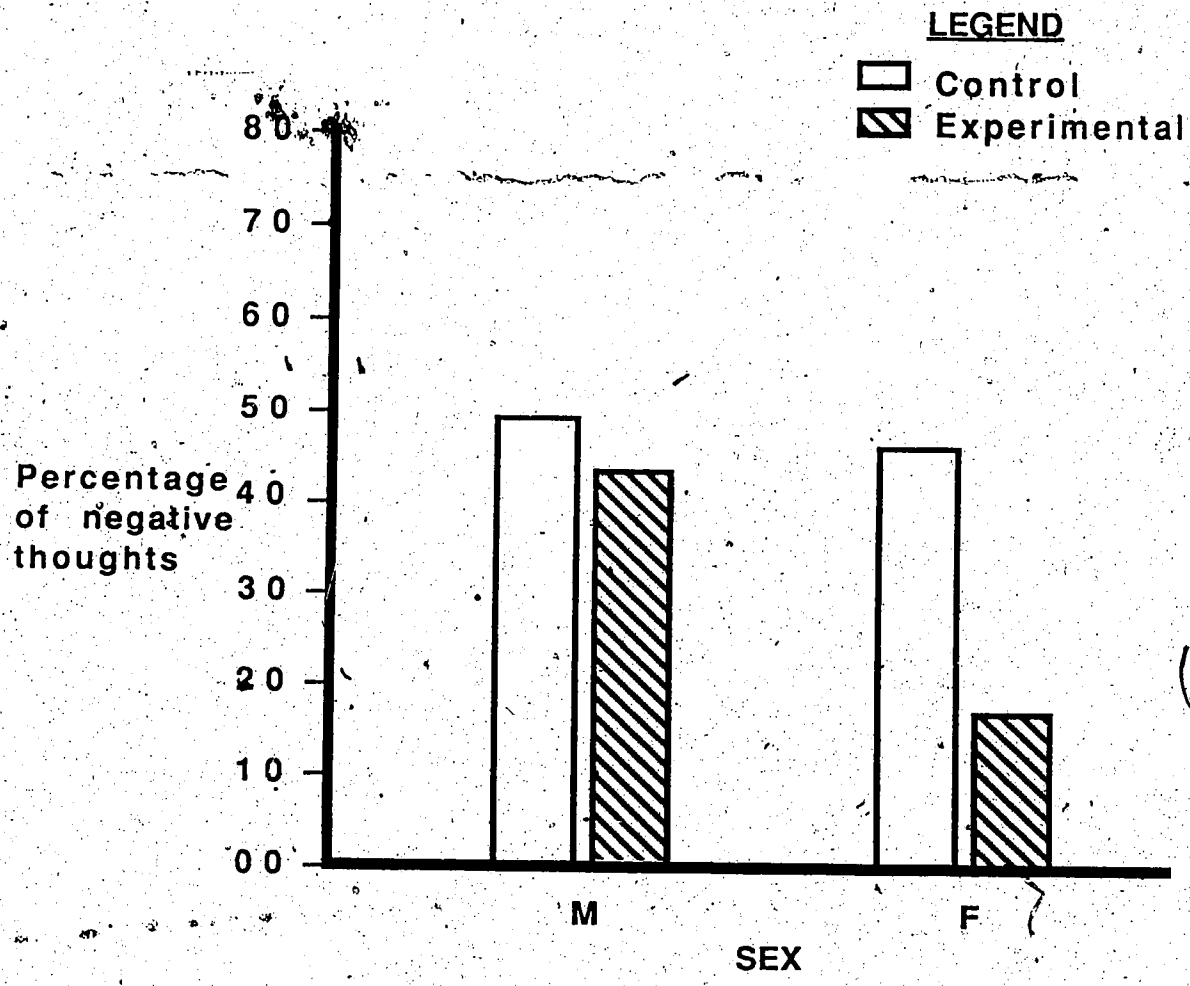

Figure 11. Adjusted cell means of percentage of negative thoughts to scene 1 for male and female subjects in control and experimental groups at posttreatment.

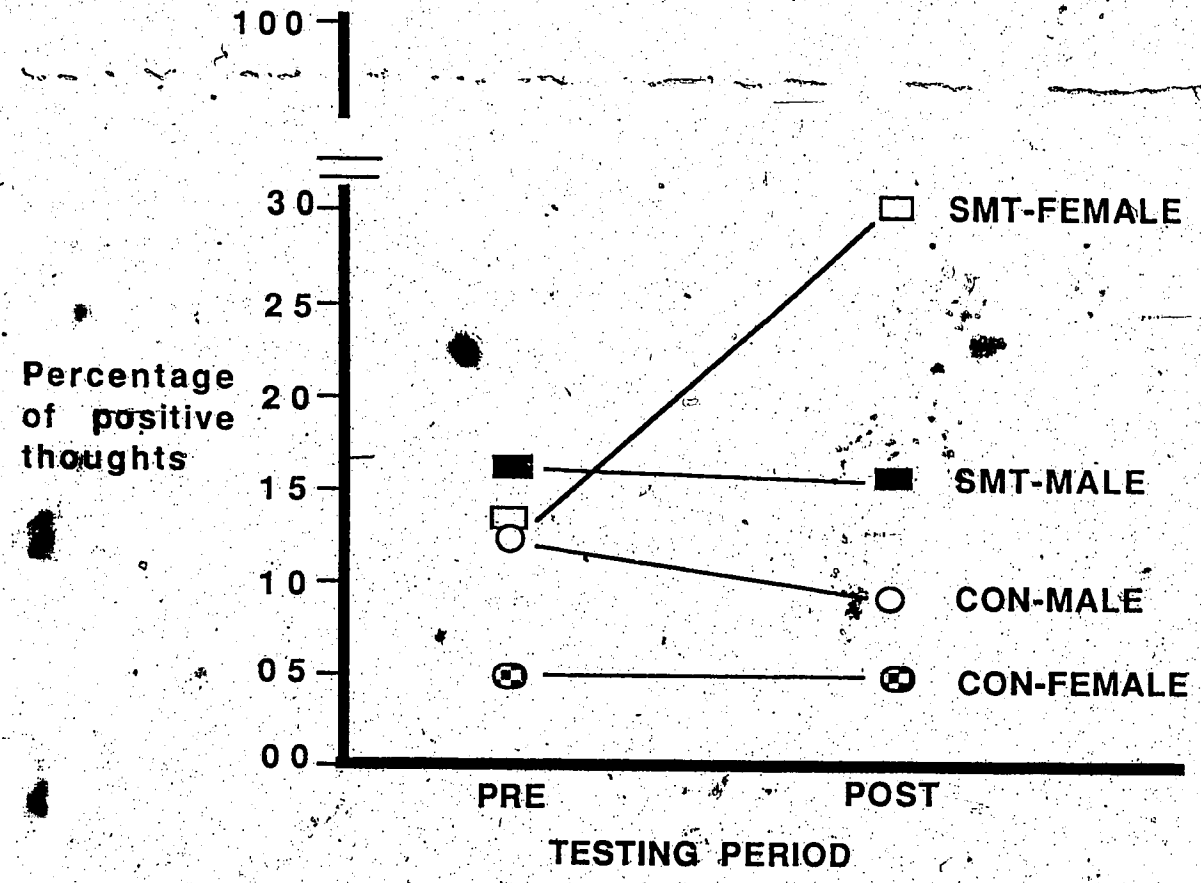

Figure 12. Percentage of positive thoughts to scene 2 at pretreatment and posttreatment for male and female subjects in control (CON) and experimental (SMT) groups.

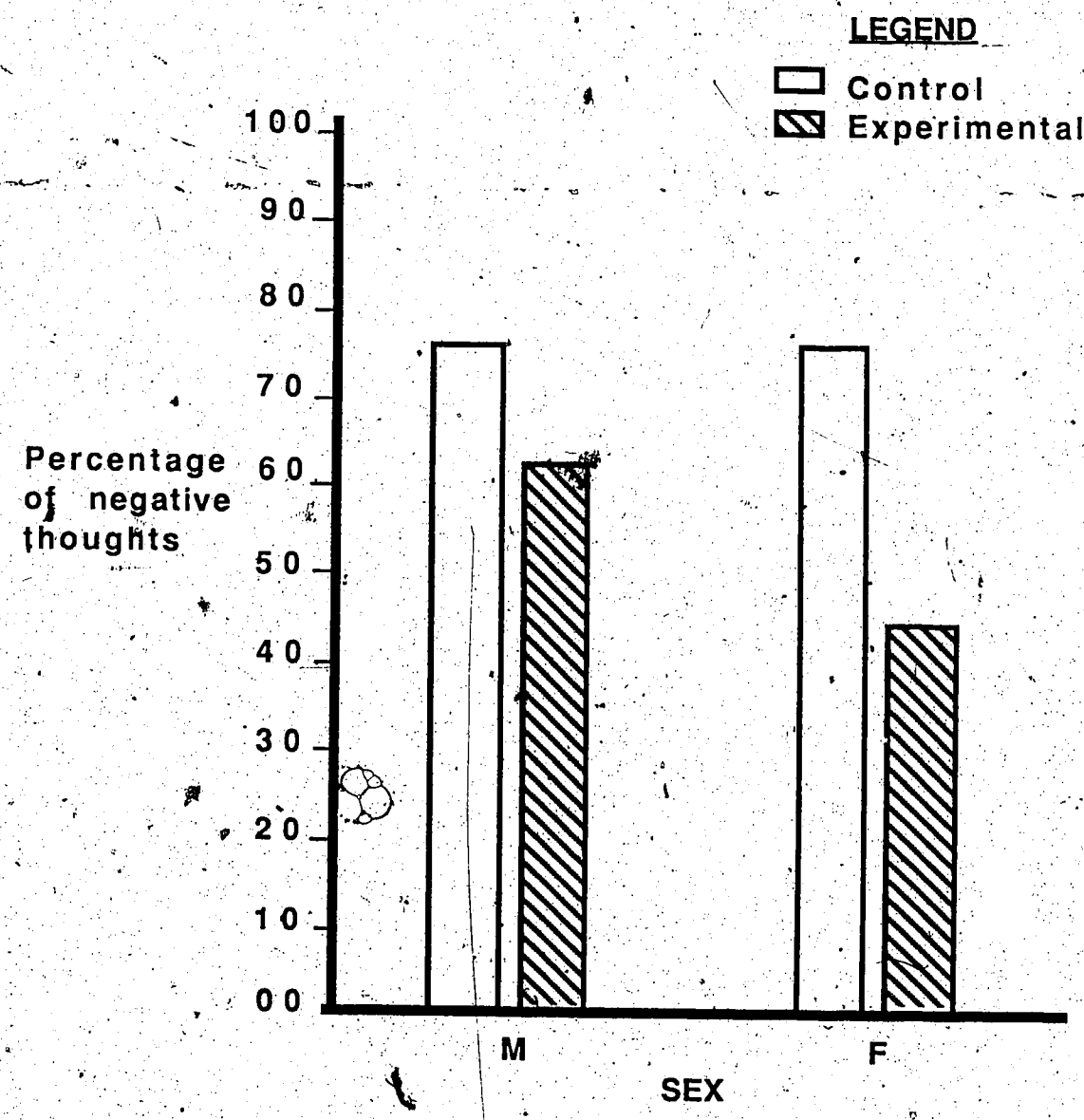

Figure 13. Adjusted cell means of percentage of negative thoughts to scene 2 for male and female subjects in control and experimental groups at posttreatment.

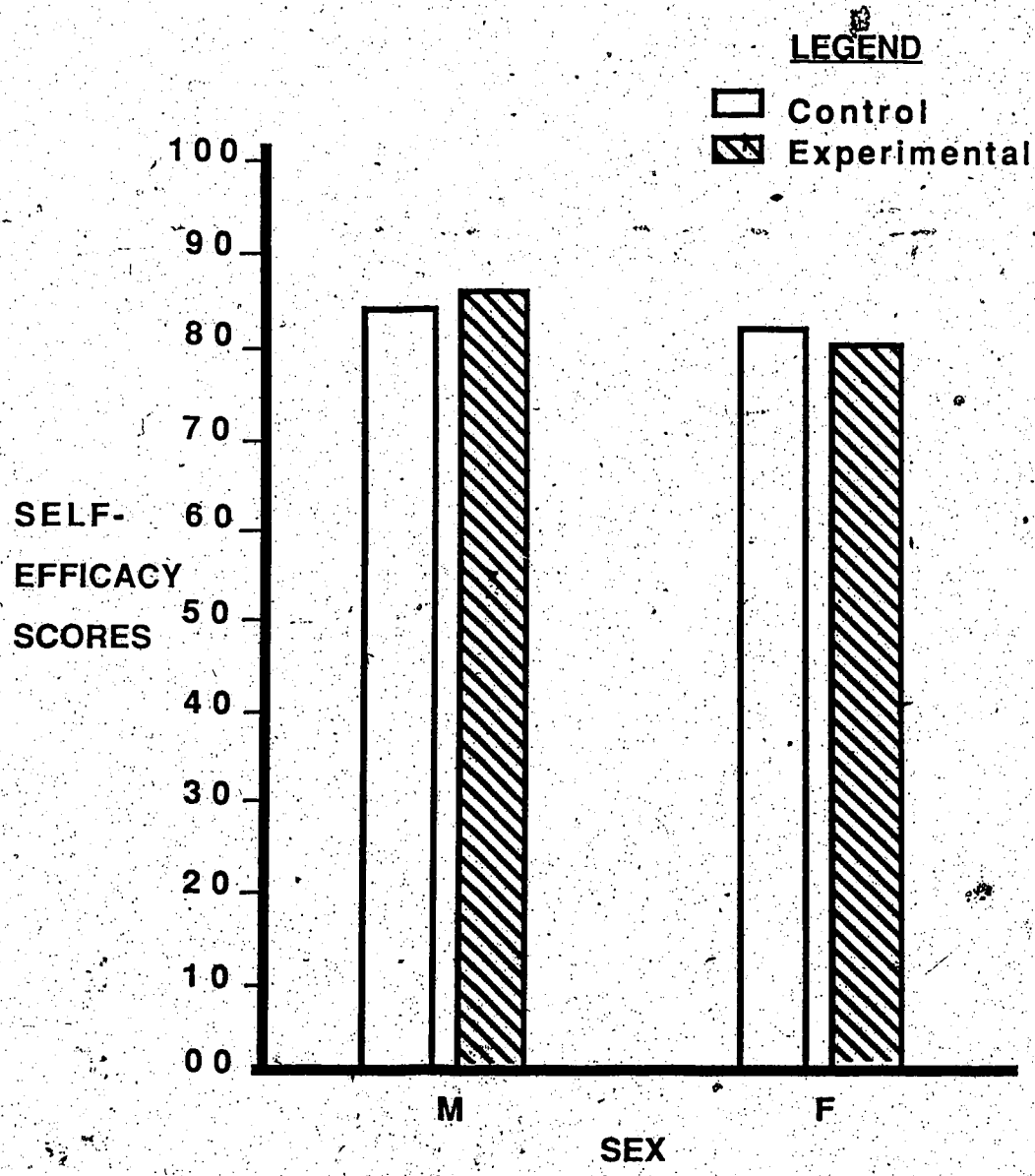

Figure 14. Adjusted cell means for general self-efficacy for male and female subjects in control and experimental groups at posttreatment

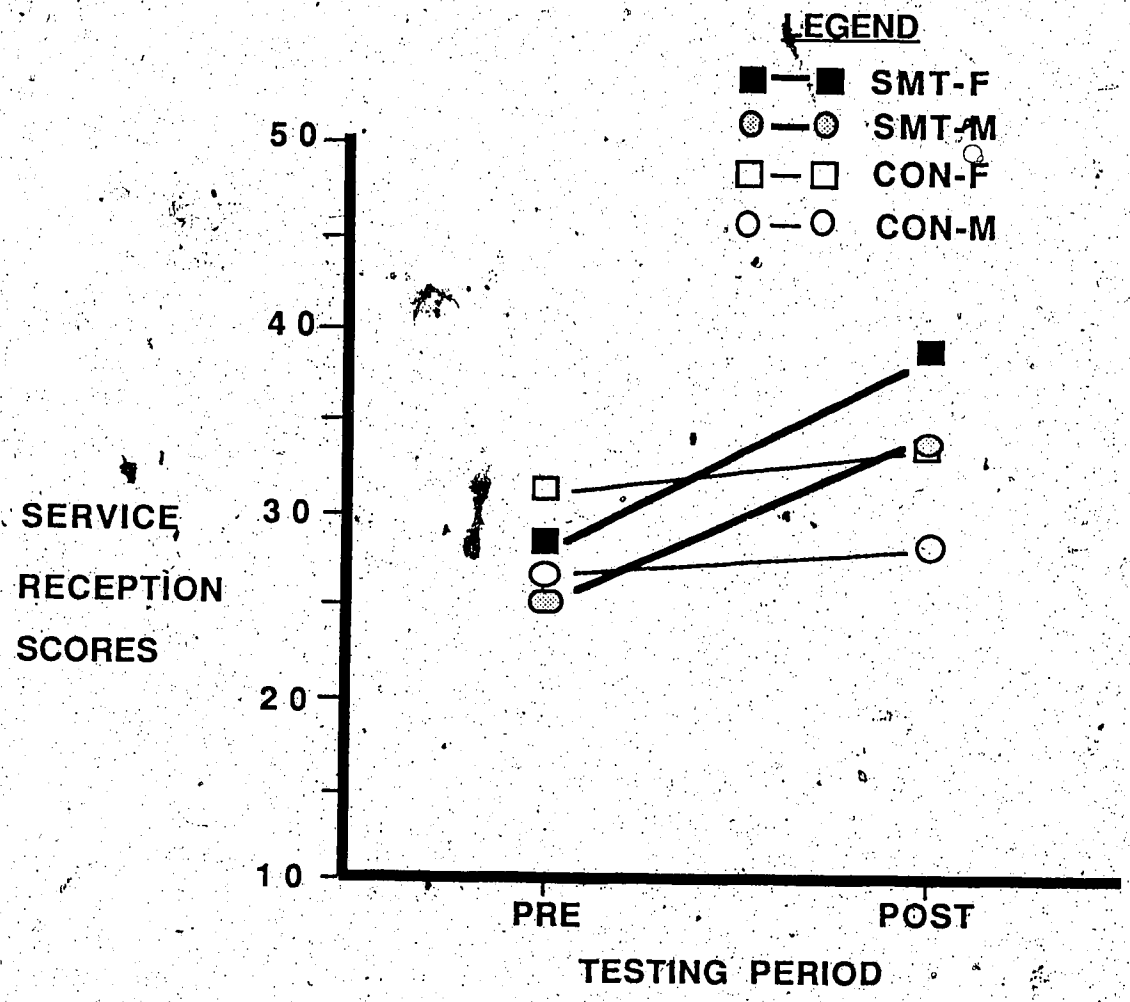

Figure 15. Service reception scores at pretreatment and posttreatment for male and female subjects in control and experimental groups.

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APPENDICES

Appendix A

Cognitive-affective Stress Management Training Manual

Session 1

A. OBJECTIVES

1. To present stress management as an important part of volleyball excellence.
2. To introduce a conceptual model of the stress response.
3. To introduce relaxation training.

B. SUMMARY

Introduction. The session will begin with small group discussion identifying stressful situations in volleyball. The trainer will ask the players to consider question such as, What was it like? What were your thoughts? How did your body feel? The trainer will emphasize the role of thoughts and cognitive evaluation of the stressor. The whole group will share stress experiences for group discussion.

Model. Smith and Ascough's (1985) model of the stress response will be shown on the overhead screen. This model will be offered in a manner congruent with the athlete's reported experiences. The trainer will highlight how physiological arousal and cognitions interact in the stress response. The players will also be introduced to the relationship between arousal, performance, and task difficulty.

Relaxation. The trainer will emphasize that stress can be controlled. One means of control is through relaxation training. Relaxation will be introduced as an active coping skill.

Procedures for relaxation training

Get as comfortable as possible. Loosen any tight clothing and do not cross your legs. Take a deep breath, let it out slowly, become relaxed as possible. Bend your arms at the elbow. Now make a fist with both hands, and bend your wrists downward while simultaneously tensing the muscles of your upper arms. This will produce a state of tension in your hands, forearms, and upper arm. Hold the tension for five seconds and study it carefully, then let it out halfway and hold for an additional five seconds. Notice the decrease in tension but also concentrate on the tension that remains. Now let your arms relax competely. Notice how the tension and discomfort drain from your hands and are replaced by sensations of comfort and relaxation. Focus on the contrast between the tension you felt and the relaxation you now feel.

Concentrate on relaxing your arms completely for 10 to 15 seconds. As you breathe normally, concentrate on those muscles and give yourself the mental command to relax each time you
exhale. Do this for 7 to 10 breaths.

Tense the calf and thigh muscles in your legs. You can do this by straightening out your legs hard and pointing your toes downwards. Hold for five seconds and then slowly relax halfway and hold for an additional five seconds. Now slowly let the tension out completely and focus on the relaxation spreading into them. Finish by giving the muscle command "relax" each time you exhale (7 to 10 times) and concentrate on relaxing as deeply as possible.

Tense your stomach muscles hard for five seconds and concentrate on the tension. At the same time press the palms of your hands together and push to tense your chest and shoulder muscles. Hold the tension for five seconds, then let it out halfway for an additional five seconds. Focus on the decreasing levels of tension. Now relax those muscles completely. Again, do the breathing procedure with the mental command to deepen relaxation in your stomach, chest, and shoulder muscles.

Arch your back and push your shoulders back as far as possible to tense your back muscles. (Be careful not to tense too hard). Let the tension out halfway after five seconds, hold the reduced tension
and focus on it carefully for an additional five seconds, then relax your shoulder and back muscles completely. Finish by doing the breathing and mental command as you relax your back muscles as deeply as possible.

Tense you neck and jaw muscles by thrusting your jaw outwards and drawing the corners of your mouth back. Hold for five seconds, release the tension halfway for another five seconds, then slowly relax these muscles completely. Allow your head to hang comfortably while you focus on relaxing these muscles completely with your breathing command and mental command. Wrinkle your forehead and scalp by raising your eyebrows. Hold the tension for five seconds, then release it halfway for an additional five seconds. Then relax the tension away completely. Focus on relaxing your scalp and forehead muscles completely, using your breathing and mental command.

While sitting in a totally relaxed position take a series of short inhalations, about one per second, until your chest is filled. Hold for about five seconds, then exhale slowly for about ten seconds while thinking silently to yourself the word *relax* or *calm*. Most people can produce a deeply relaxed state by doing this. Repeat this exercise three times. Finish off your relaxation practice by concentrating on breathing comfortably into your abdomen. Simply let your stomach fill with air as you inhale and deepen your relaxation as you exhale. Abdominal breathing is far more relaxing

than breathing into the chest. (From Smith and Rohsenow, 1986).

Homework assignment. The athletes will be asked to practice relaxation training. They will record physical sensations before and after relaxation on a handout The homework assignment will be returned to the trainer at the next session.

Session 1 Homework handout.

Relaxation Training Log

After each training session, describe the (a) practice situation (your mood, the place, physical position, etc.), and (b) experiences (both physical and subjective) during and directly following the relaxation training.

1. Day

2. Date

a.

b.

1. Day

2. Date

a.

b.

Session 2

A. OBJECTIVES.

1. To review homework assignment
2. To introduce concept of cognitive mediation
3. To suggest that negative self-talk and feelings can be used as a signal to cope.

B. SUMMARY.

Review. The players will be asked to recount some experiences from relaxation training. The trainer will emphasize the importance of consistent practice in acquiring a new skill.

Cognitive mediation. The conceptual model will again be shown. The trainer will highlight the role of cognitive evaluation in stress. The trainer will introduce the notion that negative self-talk is associated with poor performance while positive self-talk is associated with good performance.

Signals for coping. The trainer will emphasize that an important step in stress management is being able to identify thoughts or feelings that trigger the stress response. The trainer will list a few examples of triggers on the board.

Imagery. The players will be introduced to the use of imagery. They will be asked to imagine a recent stressful situation and identify key thoughts and feelings that trigger the onset of distress.

Discussion. Following the imagery session, the players will be asked to list the thoughts and feelings that triggered the distressing situation and volunteer their responses for discussion.

Homework. The players will be instructed to identify triggers for stressful situations that occur either in school or volleyball. Athletes will also progress in relaxation training to combining groups of muscles in the tension/relaxation cycle.

Session 2 homework handout.

Identify "Triggers"

Situation	Stress intensity	Trigger thought or feeling

Session 3

A. OBJECTIVES.

1. To review homework.

2. To suggest that extreme negative emotions are generated by irrational beliefs.

B. SUMMARY.

Review. The players will be asked to volunteer examples of stressful situations plus accompanying thoughts and feelings. Taking one or two situations as examples, the players will be asked what thoughts may have exacerated the stress. The trainer will reinforce the relationship between negative thoughts and stress.

Irrational beliefs. The trainer will suggest that disruptive negative emotions such as anger and high anxiety are often generated by irrational beliefs. Many beliefs, though widely embaced by our culture, are quite irrational. Examples of irrational beliefs from Ellis's RET framework and Beck's (1976) Cognitive therapy will be displayed on the overhead screen. The players will discuss the implications of these irrational beliefs and cogntive distortions in elicting stressful situations in volleyball.

Substitution self-statements. It will be suggested that irrational self-statements can be replaced by substitution self-statements that can help control or reduce the stress response.An example is to replace the self-statement, "I must always be successful in order to be worthwhile", with the self-statement, "I can do no more then give 100% and I'm still the same person whether I succeed or not".

Homework assignment. The players will be asked to identify stress situations that occur to them in volleyball or school. They will identify the irrational beliefs that contribute to the stress response and to replace irrational self-statements with substitution self-statements. Players will also continue the relaxation training.

Session 3 homework handout.

Identify irrational beliefs and substitution self-statements

1. Stressful situation or experience

2. Identify irrational beliefs

3. What thoughts or self-statements accompanied the stress

4. What are some substitution self-statements.

Session 4.

A. OBJECTIVES.

1. To review homework.
2. To rehearse relaxation coping skills to control emotional response.

B. SUMMARY.

Review. The players will volunteer examples from their homework. The group will try to identify common irrational self-statements and beliefs.

Induced affect. The trainer will explain how players can control high emotional arousal through relaxation. It will be explained how the relaxation response fits into the integrated coping response. Emotional arousal will be elicted through the induced affect technique. The trainer will show the stages involved in the induced affect procedure on an overhead screen. Players will be asked if there are any questions about the technique before the onset of the procedure. The steps involved in the session will be as follows:

Players find a comfortable position and begin relaxation response.

Once the players are relaxed, the trainer instructs them to imagine an intense stressful scene.

The trainer instructs the players to focus on feeling that the situation has created; it is suggested that as they focus on the feeling, the feeling will become stronger and stronger.

Emotional arousal is verbally reinforced and encouraged.

The players are instructed to "turn it off" with the relaxation response.

When the emotional arousal is reduced and the players are relaxed, they will sit up.

There will be a group discussion about the experience elicted by the induced affect technique and the effectiveness of the relaxation response. The session will close with a suggestion by the trainer that continual rehearsal of the technique will result in efficient and effective stress control.

Homework assignment. The players will be instructed to rehearse the relaxation response to reduce emotional arousal elicted by the induced affect technique. Players will record their observations on a hand-out.

Session 4 homework handout.

Relaxation and Induced Affect

1. Describe your image.

2. How involved in the image were you?

3. How intensely did you feel the physical sensations?

4. Describe the thoughts that accompanied the image.

5. Did you have trouble building and holding the strong emotions of the image? If so, explain.

6. Once you began the relaxation coping response, how long did it take to reduce the emotional arousal?

7. Did certain sensations persist longer than others? For how long?

Session 5.

A. OBJECTIVES.

1. To review homework.
2. To develop mental coping skills.
3. To practice mental coping skills to control emotional responses

B. SUMMARY.

Review. The players will be asked to volunteer experiences from using induced affect technique.

Volleyball-specific self-statements. The trainer will review the use of self-statements in controlling stressful situations. It will be explained how self-statements can be incorporated in the integrated coping response.

Classroom assignment. Each player will be instructed to develop a list of personally relevant self-statements that can be applied in stressful situations.

Self-statements and induced affect. Following a similar format as employed in session 4, players will attempt to use self-statements to reduce the emotional arousal elicted by the induced affect technique. The players will receive a brief description of how to incorporate the mental coping response into the integrated coping response. It will be emphasized to emit the self-statements during the inspiration cycle of deep breathing. Before the onset of the induced affect procedure, players will be instructed to select and use self statements appropriate to the imagined stressor.

Homework assignment. The players will be instructed to practice using self-statements to reduce emotional arousal generated by the induced affect procedure. Players will also be asked to use the relaxation coping response about every fourth scene. Players will record observation on the hand-out.

Session 5 homework handout.

Self-statements and Induced Affect

1. Describe your image.

2. How involved in the image were you?

3. How intensely did you feel the physical sensations?

4. Describe the thoughts that accompanied the image.

5. What self-statements did you use to turn off the image?

6. How long did it take to reduce the emotional arousal?

7. Did certain sensations persits longer than others? For how long?

8. Were some self-statements more effective than others in helping you gain control?

Session 6.

A. OBJECTIVES.

1. To review homework.
2. To develop skill-specfic self-statements to guide performance in stressful situations.

B. SUMMARY.

Review. Players will discuss the effectiveness of using mental coping skills to reduce emotional arousal. The review will close with the trainer drawing an analogy between physical skills and coping skills. The more the skill is practiced, the easier and more effective the coping skill will become.

Symbolic modeling. The players will watch an ex-National Team player demonstrating the use of self-talk while successfully performing the volleyball skills of service reception and serving. The player will emit aloud strategy based self-statements appropriate to the skill. The demonstration will be followed by a group discussion.

Induced affect. The trainer will instigate a short discussion about how performance self-statements can be used to guide performance and prevent negative ideation in potentially distressing game situations. The players will then employ the use of these self-statements while imagining very stressful game situations.

Homework. The players will be instructed to use skill specific self-statements in both imaginal induced affect conditions and IN VIVO skill practice. Athletes will record the effectiveness of the self-statements on a hand-out.

Session 6 homework handout.

Self-statements and Induced Affect

1. Describe your image.

2. How involved in the image were you?

3. How intensely did you feel the physical sensations?

4. Describe the thoughts that accompanied the image.

5. What self-statements did you use to turn off the image?

6. How long did it take to reduce the emotional arousal?

7. Did certain sensations persits longer than others? For how long?

8. Were some self-statements more effective than others in helping you gain control?

Session 7.

A. OBJECTIVES.

1. To review the homework assignment.
2. To practice the use of the integrated coping response

B. SUMMARY.

Review. There will be a short discussion concerning the effectiveness of using skill specific self-statements. The group will try to identify any problem areas and suggest possible solutions.

Integrated response. The trainer will show a schematic representation of the integrated coping response on a overhead screen. The procedures of the response will be described. As the player inhales, she or he emits a stress reducing self-statement. At the peak of inhalation, the subject says the word "so" and while slowly exhaling, instructs him/herself to "relax" and induce muscular relaxation. Following a similar format used in previous induced affect sessions, the players will rehearse the integrated coping response to "turn off" emotional arousal. The session will close with trainer emphasizing the importance of repeated practice for the effective utilization of the integrated coping response.

Homework assignment. The players will be instructed to rehearse the integrated coping response using the induced affect procedure. After several rehearsal sessions, the player will employ the coping response in skill practice and game situations. The effectiveness of the coping response will be recorded on a hand-out.

Session 7 homework handout.

Integrated coping response and induced affect.

A. Imagery and Integrated coping response.

1. Describe your image.

2. What self-statements were used in the integrated coping response?

3. How long did it take to reduce emotional arousal?

4. Was one component of the integrated coping response easier to use than the other component?

5. How confident are you in applying the integrated coping response?

B. Integrated coping response in practice.

1. How often and in what conditions did you use the integrated coping response?

2. Did you have difficulties in applying the coping response?

3. Were there any situations in which it was more difficult to use the coping response?

4. Do you believe the coping response is helping your performance? Explain.

Session 8

A. Objectives.

1. To review the homework assignment.
2. To practice Benson's meditation technique
3. To identify different situations in which the integrated coping response may be applied.

B. Summary.

Review. The players will discuss the effectiveness of the integrated coping response in game situations. The trainer will probe to determine if there are specific phases of the game in which it is either more difficult to use the coping response or the coping response is not as effective.

Meditation. The trainer will briefly discuss Benson's meditation technique. It will be suggested that Benson's procedure is a good general relaxation technique to use in non-competitive situations. The players will practice the meditation technique for 5 to 10 minutes.

Identify different situations in which integrated coping response can be applied. The players will be divided into small groups. The trainer will instruct the groups to identify different situations where the integrated coping response can be applied. The players will be ask to consider such general factors as traveling, practice, and game situations.

Homework. Each player will continue to use the integrated coping response in both practice and game situations. The players will be asked to keep a log of stressful situations and record the effectiveness of the coping response.

Session 8 homework handout

Integrated coping response in game and practice situations

1. How effective is the coping response in reducing "unwanted" emotional arousal in game situations? Explain.

2. In what situations and how often do you use the coping response in game situations?

3. How confident are you in using the coping response in game situations?

Appendix B

Competitive Sport Anxiety Inventory -II

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

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

Appendix C

Sport Competitive Anxiety Test

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

	HARDLY-EVER	SOMETIMES	OFTEN
1. Competing against others is socially enjoyable	A	B	C
2. Before I compete I feel uneasy	A	B	C
3. Before I compete I worry about not performing well	A	B	C
4. I am a good sportsman when I compete	A	B	C
5. When I compete, I worry about making mistakes	A	B	C
6. Before I compete I am calm	A	B	C
7. Setting a goal is important when competing	A	B	C
8. Before I compete I get a quesy feeling in my stomach	A	B	C
9. Just before competing I notice my heart is beating faster than usual	A	B	C
10. I like to compete in games that demand considerable physical energy	A	B	C
11. Before I compete I feel relaxed	A	B	C
12. Before I compete I am nervous	A	B	C
13. Team sports are more exciting than individual sports	A	B	C
14. I get nervous wanting to start the game	A	B	C
15. Before I compete I usually get uptight	A	B	C

Appendix D

Thought listing

Name

Sex

Date

Instructions:

We are interested in what you are thinking about during the presentation on the tape. You are to image yourself in the position of the player in the situation. You should try to record only those ideas you are thinking about during the presentation.

Please state your thoughts and ideas as consisely as possible .....

a phrase is sufficient.

IGNORE SPELLING, GRAMMAR, AND PUNCTUATION.

You will have 2 1/2 minutes to write your thoughts.

Write in the first person, not in the third person.

That is, write thoughts like, "I know I'm a good player" or "Good serve" or "*&#@%".

PLEASE BE COMPLETELY HONEST AND RECORD ALL OF THE THOUGHTS THAT YOU HAD.

1)-PLAYER- SERVER .

SITUATION- THIRD GAMES OF A BEST OF FIVE MATCH. SEMI-FINALS OF AN IMPORTANT-TOURNAMENT. THE MATCH IS TIED 1-1 IN GAMES. THE SCORE IN THE PRESENT GAME IS TIED 10-10.

2) PLAYER- TALL, BLOND HAIR, IN BACK ROW IN #6 POSITION

SITUATION- FIFTH GAME IN CHAMPIONSHIP FINALS. SCORE OF GAME IS 15-14 FOR YOUR OPPONENTS. THEY ARE SERVING FOR MATCH POINT.

Appendix E

Perceived Self-Efficacy Scale

Directions: People can have different kinds of feelings about themselves and their lives. Below are some sentences which describe certain feelings that many people have. Read each statement carefully and think about yourself. Each statement will either be 1) NOT like you, 2) A LITTLE like you, 3) SOMEWHAT like you, 4) FAIRLY MUCH like you, or 5) VERY MUCH like you. There are no right or wrong answers. Be as accurate and honest as you can about your feelings.

	not at all like me	a little like me	somewhat like me	fairly much like me	very much like me
1. Once I know what I need to do I can do it.	1	2	3	4	5
2. In a new situation I expect I can handle things	1	2	3	4	5
3. I am a confident person	1	2	3	4	5
4. I am not very effective in solving problems	1	2	3	4	5
5. When I'm stressed, I count on myself to cope successfully	1	2	3	4	5
6. I'm not a self-assured person	1	2	3	4	5
7. I have control of my reactions to stress	1	2	3	4	5
8. I can usaully get what I want	1	2	3	4	5
9. I rely on my inner strength to deal with problems	1	2	3	4	5
10. The good things that happen to me are largely my own doing	1	2	3	4	5
11. I'm proud of myself	1	2	3	4	5
12. I do not have a high opinion of my abilities	1	2	3	4	5
13. I wish I had more confidence in my ability to succeed in life	1	2	3	4	5
14. People know they can expect a lot from me	1	2	3	4	5
15. I believe I use my skills to their best advantage	1	2	3	4	5
16. I am responsible for the ways I have grown as a person	1	2	3	4	5
17. I can influence the people in my life	1	2	3	4	5
18. I can make my interactions with people end up the way I expect them to.	1	2	3	4	5
19. I am quick to learn new things about ways to deal with problems	1	2	3	4	5
20. I am not afraid to make mistakes	1	2	3	4	5
21. I know what people expect from me	1	2	3	4	5
22. I question my abilities in difficult situations	1	2	3	4	5

Appendix F

Ancillary Questionnaire

Additional information

NAME:

SEX:

1. How many years have you been playing competitive Volleyball?

2. Have you played on a Provincial Team before? If yes, name the team and the year.

3. How would you rank your volleyball ability compared to your Provincial Teammates?

1. Top 10%
2. Top 30% but not top 10%
3. Middle 40%
4. Bottom 30% but not bottom 10%
5. Bottom 10%

4. Compared to your normal playing ability, how would you rate your performance in very important games?

1. Far above normal
2. above normal
3. normal
4. below normal
5. far below normal

5. In important games, how much do you think that stress interfers with your-performance.

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

6. Please list all the volleyball related situations that personally upset you, anger you, or cause stress. Rate the average intensity of each situation.

Very low= 1 to Extreme=10

7. When you are under pressure and feel stressed, what do you do to manage the stress. Please explain in detail.

Appendix G

Program evaluation questionnaire

UNIVERSITY OF ALBERTA

P.R.E. CROCKER

STRESS MANAGEMENT PROJECT

1987 ALBERTA CANADA GAMES TEAMS.

YOUR HONEST RESPONSES ARE NEEDED TO EVALUATE THE EFFECTIVENESS OF THE STRESS MANAGEMENT PROJECT. IF WE CAN PINPOINT THE PROGRAM'S STRENGTHS AND WEAKNESSES, THEN WE CAN MAKE MODIFICATIONS TO IMPROVE THE PROGRAM. AS A REMINDER, THE COPING SKILLS YOU HAVE LEARNED ARE ONLY AS EFFECTIVE AS YOU YOU MAKE THEM... REMEMBER TO CONTINUALLY PRACTICE THESE SKILLS IN PRACTICE SESSIONS AND GAMES.

NAME: _____

DATE: _____

1. IN GENERAL, HOW EFFECTIVE WAS THE PROGRAM IN HELPING YOU UNDERSTAND THE PROCESSES INVOLVED IN NEGATIVE STRESS?

1- NOT AT ALL
2- SOMEWHAT
3- MODERATELY SO
4- VERY MUCH SO

2. HOW EFFECTIVE WAS THE PROGRAM IN HELPING YOU CONTROL NEGATIVE STRESS?

1- NOT AT ALL
2- SOMEWHAT
3- MODERATELY SO
4- VERY MUCH SO

3. THE STRESS MANAGEMENT PROGRAM CONSISTED OF SEVERAL STRATEGIES. RATE THE EFFECTIVENESS OF EACH STRATEGY IN HELPING YOU LEARN TO CONTROL STRESS?

(1= VERY MUCH; 2= MODERATELY SO; 3= SOMEWHAT; 4= NOT AT ALL)

PROGRESSIVE RELAXATION
ROLE OF IRRATIONAL BELIEFS AND COGNITVE DISTORT
GENERAL MENTAL SELF-TALK
SKILL AND STRATEGY SPECIFIC SELF-TALK
INTEGRATED COPING RESPONSE
MEDITATION

4. IN FUTURE PROGRAMS, WHICH COMPONENTS SHOULD BE MORE EMPHASIZED?

5. WHICH COMPONENTS SHOULD BE DE-EMPHASIZED OR ELIMINATED?

6. IN FUTURE STRESS MANAGEMENT PROGRAMS, WHAT ADDITIONAL FACTORS OR COMPONENTS COULD BE ADDED?

7. COMPLIANCE OR ADHERENCE TO PSYCHOLOGICAL PROGRAMS IS ALWAYS A PROBLEM. HOW COULD COACHES AND SPORT PSYCHOLOGISTS HELP ATHLETES TO COMPLY WITH PSYCHOLOGICAL TRAINING.

8. HOW OFTEN DO YOU (ON AVERAGE) PRACTICE OR USE THE INTEGRATED COPING RESPONSE TO HANDLE STRESS OR FACILITATE PERFORMANCE? (BE HONEST).

1- MORE THAN ONCE A DAY
2- ONCE/DAY
3- TWICE/WEEK
4- ONCE/WEEK
5- ONCE/TWO WEEKS
6- ONCE/MONTH
7- NEVER

9. DURING THE COURSE OF THE STRESS MANAGEMENT, HOW OFTEN DID YOU PRACTICE OR USE THE STRATEGIES OF THE STRESS MANAGEMENT PROGRAM (USE SCALE FROM QUESTION EIGHT)?

PROGRESSIVE RELAXATION
ROLE OF IRRATIONAL BELIEFS AND COGNITVE DISTORTIONS
GENERAL MENTAL SELF-TALK
SKILL AND STRATEGY SPECIFIC SELF-TALK
INTEGRATED COPING RESPONSE
MEDITATION

10. DURING THE NATIONAL CHALLENGE CUP IN REGINA, DID YOU FIND THAT COPING SKILLS WERE IMPORTANT IN PLAYING GOOD VOLLEYBALL? EXPLAIN.

11. AFTER THE CHALLENGE CUP, DID YOU WISH THAT YOU HAD SPENT MORE TIME PRACTICING THE COPING SKILLS TAUGHT IN THE STRESS MANAGEMENT PROGRAM? EXPLAIN.