

EFFECT OF A PHYSICAL TRAINING PROGRAM INVOLVING PSYCHO-
PHYSICAL STRESS UPON THE ANXIETY AND SELF-CONCEPTS
OF MALE MILITARY COLLEGE STUDENTS

by

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Chapter 1

INTRODUCTION

Physical educators are involved with the development of both the psychological and physiological aspects of man and are concerned with the growth of the "total" individual. This growth and development process is approached through participation in physical activity (Frost, 1971).

Observation of and feedback from participants in various programs of physical activity have suggested that as young men and women see themselves improving physically and surmounting obstacles placed before them, their motivation increases and their sense of accomplishment is such that they can more easily deal with subsequent obstacles they may encounter (Frost, 1971). These observations indicated that certain types of physical activity can provide the individual with an increased self-awareness and appreciation of his own capabilities and limitations, as well as those of his peers. Naylor (1975) has asserted that increased self-perception and self-assurance can be achieved by introducing the elements of adventure and risk into physical education programs. He suggested that programs be developed in which participants experience risk and challenge, from both the physical task confronting them and the psychological threat it may impose.

Utilizing risk and adventure as elements of programs of physical activity implies the necessity to place participants under stress. Spielberger (1971:267) defined stress

as ". . . the amount of physical or psychological danger associated with the objective stimulus properties of a situation." Selye (1956:54) further defined stress as ". . . the state manifested by a specific syndrome which consists of all the nonspecifically induced changes within a biologic system." Both Selye (1974) and Barnard (1968) differentiated between damaging or harmful stress, sometimes defined as dys-stress and stress which can be beneficial to the organism. It follows, then, that placing individuals in stressful situations need not be detrimental to their psychological or physical states, but may, in fact, improve their functioning in both areas.

Placing an individual in a situation which may be psychologically or physically threatening or which causes him to feel psychologically or physically ineffective will produce anxiety (Spielberger, 1966). Spielberger (1970:3) differentiated between two types of anxiety. He defined "state" anxiety as

. . . a transitory emotional state or condition of the human organism that is characterized by subjective, consciously perceived feelings of tension and apprehension, and heightened autonomic nervous system activity. It may vary in intensity and fluctuate over time.

"Trait" anxiety is defined by Spielberger (1970:3), as referring

. . . to relatively stable individual differences in anxiety proneness, that is, to differences between people in the tendency to respond to situations perceived as threatening with elevations in state anxiety.

Programs of physical education that place individuals in stressful, anxiety producing situations may have the potential to contribute to the participant's self-concept or self-esteem, and to alter their level of anxiety, at least with regard to situations and activities they confront within the program. An example of such a program exists at the Virginia Military Institute (V.M.I.).

The Virginia Military Institute
"Rat" Training Program

All freshman cadets (Rats) attending the Virginia Military Institute are required to participate in an 11 week physical training program referred to as "Rat" training. The one exception to this requirement is that varsity athletes in season do not participate in the 11 week program but are required to take part in a condensed version of this program at the end of their competitive season.

The V.M.I. "Rat" training program is directed by the chairman of the V.M.I. department of health and physical education, and is administered by members of the physical education staff with assistance from selected upper class cadets and the department of military science. "Rat" training is conducted twice weekly in 2 hour sessions during the fall semester. The training is conducted in a military fashion as cadets participate in the program in company size units and rotate through a series of prescribed activities involving physical and psychological stress. The combination of

activities and problems was developed by Dr. Clark King of V.M.I. from ideas gleaned from Kurt Hahn's "Outward Bound" concept, (Hogan, 1968; Outward Bound, 1973) Dr. Kenneth H. Cooper's (1968) aerobics program, and various military programs.

The program is designed to introduce physical challenge into the training of young men as a means of developing their character. The concept behind the program is to stress and test the physical capabilities of the cadets to demonstrate to them that the limit of their physical capacity is far beyond what they believe it to be. It has been postulated that the program contributes to physical fitness, to the enhancement of the participant's self-concept and to the reduction of anxiety, by providing opportunities to experience challenging physical confrontation that can be overcome with a minimum of athletic ability.

It has further been speculated that these types of experiences are especially valuable to young men pursuing a commission in the armed services or a military career. Poise, self-confidence, and self-esteem as well as the ability to function under and deal with anxiety, are of vital importance in any endeavor, but especially so in war time, military situations (Rigg, 1955).

The activities making up the "Rat" training program commence with 10 to 15 minutes of rifle exercises in company formation, followed by an endurance run of from one to 1.5

miles to the training area. Company size units (30 to 40 cadets) are then rotated through the following 12 activity stations:

1. The "Pit" is an area utilized for such activities as tugs of war, Indian wrestling and other combative experiences. The aim of this activity is to give cadets the opportunity to realize that physical contact of a combative nature need not be a frightening, dangerous experience, but may be exhilarating and even fun.

2. Pugil sticks are utilized for instruction and application of the Marine Corps training technique for hand-to-hand combat with the rifle.

3. The "slide for life" is a hand-supported 200 foot slide over and into a river utilizing a "T"-bar pulley on a steel cable. This activity begins with a climb of approximately 30 feet up a tree ladder to the cable. Cadets are spotted but unassisted in this climb. This activity introduces the elements of height and water into the training.

4. Rappelling is a mountaineering technique in which an individual utilizes ropes to descend a 125 foot cliff.

5. Log and rope confidence obstacles require the cadets to traverse a log elevated 10 feet from the ground, to a cable and rope walk which traverses a distance of 25 feet and is 15-20 feet above ground level. The cadets also

negotiate a "rope slide" which involves climbing a wooden "tree" ladder to a rope 20 to 25 feet above ground. The rope extends from this point to ground level, and must be mounted and traversed by a sliding technique. Also included among these obstacles is the "swinging log," which involves a freely movable log suspended eight feet from the ground, that is mounted and traversed by a squad of men.

6. The "wall" is a group problem involving a 13 feet high board wall that confronts a squad of men. The problem is to find a way to get all men in the group over the wall without the assistance of ropes, logs, or any other devices not physically present on the men.

7. The river crossing requires the cadets to use ropes for a river crossing.

8. The physical conditioning area is a series of circuit training stations utilizing exercises to develop muscular strength and endurance.

9. A mountain march occurs at least once during the program and requires each company to participate in a forced march exercise in which they ascend and descend a small mountain as rapidly as possible.

10. The stamina course is a 3.1 mile course which contains the following confidence, agility, and strength obstacles that must be negotiated in order to complete the course: a rope traverse across a small stream; several log jumping and balancing obstacles; a parallel log obstacle that

must be traversed using only the hands and arms (arm-walking); a dive through a freely swinging tire suspended by a rope from a tree limb; a cable and rope walk across a ravine; a wall that must be mounted and vaulted; a "kip" bar that must be negotiated; a horizontal ladder that must be negotiated with a hand-over-hand technique; and a hill climb which is negotiated as rapidly as possible with the assistance of a "helper" rope which is strung approximately chest high the length of the hill.

11. The endurance run is near the end of the program and requires each company to culminate its endurance training with a five mile run while remaining in company formation.

12. The log exercises station is designed to teach teamwork and to improve strength and muscular endurance. It requires groups of cadets to participate in a series of maneuvers which involve lifting, controlling, and otherwise manipulating logs approximately 10 inches in diameter and weighing 500 to 600 pounds.

These 12 stations just described are one-quarter to one-half mile apart, and cadets run from station to station in formation. Time limitations prevent the companies from participating at each station each day, but participation is scheduled to insure that the companies are exposed to all of the stations during the 11 week period.

STATEMENT OF THE PROBLEM

The Virginia Military Institute has developed and supported the "Rat" training program on the basis of its purported ability to introduce physical and psychological challenge into the training of young men as a means of developing their character. Therefore, the central problem of this research effort was to determine to what extent this program alters the anxiety and self-concept of participants.

NEED FOR THE STUDY

A major argument presented by physical educators in support of physical education programs is the influence and importance the programs have in the personality and character development of participants (Frost, 1971; Gerstung, 1974; Sprandel, 1974; Van Slooten, 1974; Kinder, 1973; Kniker, 1974). Yet, the major focus of research concerning the effect of physical training on psychological parameters such as anxiety and the self-concept, has mainly been focused on one facet of physical education, namely, athletics. Hellison (1970), suggested that most researchers in physical education have not directly investigated the effect of various physical education programs and teaching methods on self-concept. He indicated that they have dealt primarily with the relationship between athletic success and selected psychological variables. While researchers such as Koepke (1974), Wetmore (1972) and Clifford (1967), have examined the utility of

physical education programs, such as Outward Bound, little evidence is available to indicate the effectiveness of such programs in secondary and collegiate institutional settings. Only Koepke (1974), examined the effects of the Outward Bound experience on anxiety, and although she found reductions in anxiety after the experience, no control group was utilized, and no threat of further "Outward Bound" activity was presented to her sample when post-tested. Regardless of these findings, it remains to be determined whether programs utilizing the concepts of Outward Bound have the potential to alter anxiety levels with regard to activities and situations not specifically associated with that program. Thus, this study was an attempt to provide some insight as to the value of programs of this type in the university or collegiate setting. The results may provide some basis for decision-making regarding physical education programs in those colleges and universities that employ a military regimen as the basis of their programs and/or are preparing young men to accept military commissions in the armed services. It may also provide information which can aid physical educators at the secondary level in evaluating the utility of programs which involve elements of risk and adventure and place individuals in situations which are physically and psychologically stressful.

PURPOSE OF THE STUDY

The fourfold purpose of the study was as follows:

1. To determine if participation in the V.M.I. "Rat" training program positively altered the self-concepts of participants over those of non-participants.
2. To determine if participation in the V.M.I. "Rat" training program significantly reduced "state" anxiety in regard to activities specific to the program.
3. To determine if participation in the V.M.I. "Rat" training program significantly reduced "state" anxiety in regard to a stressful military activity (exposure to a gas chamber) which was dissimilar to the training program activities.
4. To determine if participation in the V.M.I. "Rat" training program significantly reduced the "trait" anxiety of participants.

LIMITATIONS OF THE STUDY

1. The population sampled in the study consisted solely of freshman male military college students.
2. The sample was randomly selected from among members of the "Rat" class but no scholarship athletes, athletes in season, or cadets receiving ROTC scholarships were included in the sample.
3. The sample size was limited to 15 per group.

DEFINITION OF TERMS

Specific terms have been broadly used and interpreted in the literature associated with the research topic. The following definitions will serve to delineate the terms as used in this study:

State Anxiety

. . . a transitory emotional state or condition of the human organism that is characterized by subjective, consciously perceived feelings of tension and apprehension, and heightened autonomic nervous system activity. It may vary in intensity and fluctuate over time. (Spielberger, 1970:3)

Trait Anxiety

. . . relatively stable individual differences between people in the tendency to respond to situations perceived as threatening with elevations in state anxiety. (Spielberger, 1970:3)

Stress

. . . the amount of physical or psychological danger associated with the objective stimulus properties of a situation. . . . In essence, the term stress denotes environmental conditions or circumstances that are characterized by some degree of objective danger, either as defined by E or as consensually validated by two or more observers. (Spielberger, 1971:287) (E, in this definition, refers to any individual conducting an experiment.)

Self-Concept

. . . the way an individual perceives himself in relation to the world around him, and is related to one's sense of identity. (Wetmore, 1972:10)

OVERVIEW OF THE STUDY

In Chapter one the nature of the study, the central research problem to be examined, the need for the study and the specific purposes of the study are introduced and described. The literature related to the effects of physical training involving psychological and physical stress on anxiety and self-concept is reviewed in Chapter two. The procedures and methodology followed in the conduct of the study is presented in Chapter three and is divided into three main sections: the sample, the testing instruments and the statistical treatment and procedures. The data analysis is presented in Chapter four and the conclusions drawn from the study are included in Chapter five.

Chapter 2

REVIEW OF RELATED LITERATURE

The literature investigating the effects of physical training involving psychological and physical stress, on anxiety and self-concept was reviewed in this chapter. This review was divided into four areas:

1. Self-Concept
2. Nature and Significance of Anxiety
3. Outward Bound and Related Programs
4. Physical Training

SELF-CONCEPT

Definition

Wylie (1961), in an extensive review of self-concept literature, suggested two principal meanings for the "self." The first Wylie (1961:1) described as ". . . the self as subject or agent . . ." and the second she described as ". . . the self as the individual known to himself." Wylie (1961) asserted that the second meaning is synonymous with the term "self-concept." She further stated,

Self-concept theorists believe that one cannot understand and predict human behavior without knowledge of a subject's conscious perceptions of his environment, and of his self as he sees it in relation to his environment. (Wylie, 1961:6)

Rosenberg (1965:5) conceived of the self-image as an attitude toward an object. He stated that ". . . this includes facts, opinions, and values concerning the self, as well as a favorable or unfavorable orientation toward the self." Jacobsen (1964:20) has indicated that there are two sources for the self-image. He described these sources as follows, ". . . the first is from a direct awareness of our inner experiences, such as emotional or thought processes, and the second from indirect self-perception and introspection."

According to Snygg and Combs (1959), the integration of all of our complex self-perceptions makes up what is termed the phenomenal self. Rogers (1951:501) further amplified this definition of the self-concept by stating, "The self-concept is an organized configuration of perceptions of the self which are admissible to awareness."

This conception of the self-concept as something that can be and is subject to an individual's own conscious perceptions is perhaps best summed up by Wetmore (1972). He indicated that the self-concept must be defined in relation to an individual's sense of identity and that self-concept is the manner in which an individual sees himself in relation to his environment.

This definition relates to the conceptual basis of V.M.I. "Rat" training, which is to demonstrate to the participants that the limits of their physical and psychological

capabilities are beyond what they believe them to be, and to enable them to recognize their own previously untapped qualities and capabilities, thus improving their own self-perceptions.

Significance of the Self-Concept

The way an individual perceives himself may have a great influence on how he subsequently functions. Rogers (1951), based upon his clinical experience with "client-centered therapy," indicated that an individual's emotions and behavior are affected by the manner in which he perceives or experiences his environment. As a person grows and matures he has more and more experiences and he begins to integrate his ideas and feelings about himself into a pattern of attitudes and behavior which Rogers called the self-structure.

Lindgren (1964:41) said this about the self:

. . . it is a reference point in all interactions with the environment, irrespective of whether the environment in question consists of things or of people.

The individual then, must continually refer back to his perception of himself whenever he is interacting or functioning within a particular environment. The nature of this perception may have great influence both on immediate behavior and any subsequent interactions that take place.

Snygg and Combs (1959) also approached self-concept from a phenomenological frame of reference, or from the

perceptions of the individual himself. They indicated that an individual's perceptions of himself will to a large extent, determine his behavior. They stated,

. . . human beings are continually and insatiably engaged in a never-ending attempt to achieve an adequate self. In view of this fundamental need, the self-perceptions we possess have a tremendous role in determining every behavior. Indeed, the phenomenal self is so important in the economy of each human being that it gives continuity and consistency to his personality. (Snygg and Combs, 1959:122)

Snygg and Combs (1949:17) have also emphasized the importance of experience and perceptions to the phenomenal self:

The only reality an individual can know and subsequently respond to is that which he has experienced. As an individual grows and matures, he will interpret his environment in the light of his repertoire of past experiences . . . those perceptions which are instrumental in the formulation of the individual's concept of himself, his self-concept or phenomenal self, are of paramount importance where development and adjustment of the personality are concerned.

Maslow (1968) has identified certain experiences which he terms "peak experiences" that enable an individual to be more self-perceptive and produce beneficial personality effects that otherwise would not have occurred. These "peak experiences" vary from individual to individual and may involve such things as physical accomplishment, love, various experiences within the context of nature and the elements, and certain religious experiences. Based upon personal interviews and written responses from a large number of college students to instructions eliciting their feelings in regard to how they felt during what they considered the most

significant experiences of their life, Maslow (1968) has indicated that following such experiences individuals report that they have increased their self-perception and self-esteem, have become less fearful, and feel that they have enhanced their ability to manage their lives. These "peak experiences," then, appear to contribute to a more positive perception of the self, and to enhancement of the self-concept. It must be pointed out, however, that Maslow himself has indicated that the cognitive experiences he has described cannot be a substitute for the cautious and skeptical procedures of science. Even in attempting to validate these cognitions with evidence of the previously mentioned effects resulting from "peak experiences," Maslow (1968) admitted that he has no experimental evidence to present, only his convictions and those of his subjects that these beneficial effects occurred.

Cantril (1950) has also concerned himself with the importance of experience in the development of self-awareness. His approach, based on his analysis of evidence drawn from various fields of human investigation, is that an individual's awareness of himself evolves through experience and that experience must involve dealing with and resolving difficulties, if an individual is to have any sense of accomplishment and feeling of self-worth.

The self-concept then, is a product of the individual's experiences and perceptions. It is of vital importance

to man's understanding and awareness of himself, and may be an essential determinant of behavior, accomplishment, and the quality of individual existence.

NATURE AND SIGNIFICANCE OF ANXIETY

As Lindgren (1964:91) noted, "anxiety is an emotion that obviously is related to fear." He offered two possible explanations for the relationship between anxiety and fear. One explanation (Lindgren, 1964:91) was that ". . . anxiety and fear are basically the same emotion and the anxiety we experience in every day situations is merely a watered down version of fear." The second explanation indicated that anxiety and fear are different emotions, and that fear is related to specific situations that present an immediate threat to the individual. Lindgren (1964:91) further stated that "fear seems to occur as a result of the perception of an immediate situation that contains elements of danger and that may result in bodily harm." He also noted that anxiety may be within the individual himself and is elicited when the individual finds himself in a situation or environment in which he feels inadequate or unable to control (Lindgren, 1964).

Jersild (1963:207) described the distress resulting from anxiety as follows:

The distress may be experienced as a feeling of vague uneasiness or foreboding, a feeling of being on edge, or as any of a variety of other feelings, such as fear, anger, restlessness, irritability, depression, or other diffuse and nameless feelings.

Two distinct types of anxiety have been described by Spielberger (1966). He differentiated between what he termed "state" anxiety, or arousal of anxiety feelings associated with a particular threatening situation, and "trait" anxiety, which is a relatively stable measure indicating an individual's level of predisposition to respond to threatening situations with increased state anxiety reactions.

Rosenberg (1965) examined the relationship between self-esteem and anxiety. He contended that anxiety contributes to the development of neurotic states and that it interfered with cognitive functioning and disrupted an individual's ability to communicate. He also noted that low self-esteem was associated with the development of increased amounts of anxiety, and that this anxiety was often manifested through physical symptoms.

Hall and Lindzey (1957:44-45) stated,

The individual's customary reaction to external threats of pain with which it is not prepared to cope is to become afraid. The threatened person is ordinarily a fearful person. Overwhelmed by excessive stimulation which the ego is unable to bring under control, the ego becomes flooded with anxiety.

Thus, the inability to cope with challenging situations may increase individual anxiety levels. It is obvious that inordinate levels of anxiety may become extremely

debilitating, and interfere with the normal, efficient functioning of the individual.

That anxiety levels can be altered has been documented by Mischel (1968), when he cited several studies in which individuals were "desensitized" to anxiety producing situations by "direct approach" and other methodologies. Walton and Mather (1963) offered two illustrations of the effectiveness of generalization techniques (systematic desensitization) in reducing anxiety in regard to stammering and other phobic symptoms. In case one, the subject suffered from severe physiological manifestations of anxiety and had difficulty speaking when exposed to enclosed areas or groups of people. According to the principle of primary stimulus generalization (Hull, 1943), a list of situations which were similar to those situations which aroused his feelings of anxiety was written. These situations involved the presence of people along routes which the subject was to traverse first at night and then during the day. The situations were hierarchically ordered so that the individual would be exposed to more stressful situations as he progressed through the route. After several exposures, the individual was required to enter an empty cafe and have coffee. Gradually, he progressed to having coffee while other customers were present in the cafe. A similar procedure was followed in regard to his fear of enclosed places such as shops and department stores. The treatment had a positive effect on

the patient and his anxiety symptoms were non-existent following a two month period of these exposures. A follow-up carried out one year later showed that his improvement had been maintained in regard to closed in or populated places, and that his speech problem (stammering) had been eliminated.

In the second case presented (Walton and Mather, 1963), the subject also suffered from a speech impairment that involved a jaw "lock" and a grinding of the teeth. This problem was intensified when the individual was in an interview setting or was confronted by people he did not know or considered his superiors. It was determined by interviewing the subject that his impediment was triggered by anxiety feelings he experienced when confronted with specific stimuli in these situations. The treatment technique utilized was systematic desensitization. An anxiety hierarchy was constructed which involved situations in which the subject was known to experience anxiety. After several sessions devoted to learning to relax, the subject was exposed to an additional 38 sessions which involved his exposure to items on the anxiety hierarchy. The results of the treatment showed that the individual's speech impediment was eliminated, and that he reported great reductions in anxiety in regard to all of his interpersonal relationships, including those with his superiors at work.

Similar results were reported by Grossberg (1965) in regard to alleviation of stage fright in a forty-one year old married, professional woman. The subject experienced unrealistic and debilitating fear in public speaking situations and had tried medication and psychiatry with negative results. She had been enrolled in a college public-speaking course, but had to drop it because of the severe anxiety she had experienced. The subject was then given an alternative treatment (desensitization) which consisted of her gradual exposure to a public speaking environment, under conditions which would elicit increasing amounts of anxiety.

After 25 such sessions, the subject was able to participate in her public-speaking class and reported much less fear than previously and was able to complete the course with a grade of B. When followed up five months later, she reported that she would still avoid speech-making if possible, but felt she could go through with it if it was important.

Further evidence that anxiety can be reduced by direct exposure to the anxiety producing situation has been presented by Freeman and Kendrick (1960). The subject in this case was a married woman, 37 years of age, who suffered from an acute fear of cats. Following examination by a psychologist, certain stimuli identified as precipitating her fear, were arranged in hierarchical order. Once this hierarchical list was determined, treatment was begun by exposing the subject to what was determined the weakest

anxiety stimulus in the hierarchy, and subsequently, to progressively stronger stimuli associated with her cat phobia. This process consisted of her exposure to material that had the texture of fur, but did not look like it; exposure to a toy kitten and pictures of cats; and eventually to a live kitten. The subject did not progress to the next step in the process until she had become accustomed to, and experienced no anxiety in the previous step. After three months of treatment, the subject reported no anxiety when around fur and could walk the streets without fear of cats. She further reported that she was able to approach and stroke a full grown black cat, all of which would have been impossible prior to this treatment.

Hodges and Felling (1970) examined different stress-producing situations and their relation to anxiety and sex. The Stressful Situations Questionnaire and an earlier form of the A-trait Scale from the State-Trait Anxiety Inventory were administered to male (N=141) and female (N=87) undergraduate students. Factorial analysis indicated that females are more prone than men to experience anxiety in situations which involve potential physical hazard; however, no differences were found between males and females in the tendency to be anxious in situations involving interpersonal relations and the possibility of social failure. Trait anxiety did not appear to be associated with situations involving physical danger, but demonstrated a moderate relationship to interpersonal and social situations.

Fenz and Epstein (1969) examined the effect of experience on the anxiety levels of novice and experienced sports parachutists. A word association test, a test of thematic aperception and a measurement of galvanic skin response were administered to both novice and experienced jumpers. It was found that the anxiety of novice jumpers gradually increased prior to their jump and peaked on jump day. The anxiety of the experienced jumpers, however, peaked earlier than did that of the novice's and gradually leveled off as the jump approached. Fenz and Epstein concluded that the experienced jumpers were able to utilize their early anxiety as a warning system, enabling them to gradually control their anxiety level so that it was reduced as they approached the actual jump.

OUTWARD BOUND AND RELATED PROGRAMS

The first Outward Bound school was established in Wales in the early 1940's. Its founder was Kurt Hahn, a man who believed that experiential learning should be incorporated into the education of all young men. At that time, (World War II was in progress) great concern was being expressed over the number of merchant seamen who after being shipwrecked, were dying for no reason other than an apparent lack of inner strength and resolve to live (Miner, 1975).

As a result of this situation, and his own personal beliefs, Hahn proposed a new type of school that would train

individuals to cope with the elements, and would involve small craft training, orienteering and endurance training, experience with rescue operations, various forms of athletic training, and an expedition at sea (Miner, 1975). Some doubts as to the applicability and usefulness of such a school initially existed, but as Miner (1975:129) indicated,

Outward Bound worked from the beginning. As Hahn had predicted, the apprentice seamen were soon caught up in the difficult challenge of the course. Pride in accomplishment, and a bond between man and environment, were to become hallmarks of Outward Bound training.

The Outward Bound movement has grown steadily since its inception, and has become an international organization. Miner (1975:128) has stated that ". . . thirty-two schools in seventeen nations use wilderness-oriented challenges to engender self-discovery . . ."

Lawrence (1963:191), after observing the Outward Bound program and interviewing instructors and participants at a Colorado Outward Bound school, stated,

Often the impact is great. Stammers and stutters may disappear, along with psychosomatic asthma conditions. Colorado's most difficult case last summer was a frail boy who had flunked out of prep school and considered himself a failure. His physical frailty was compounded by a defeatist mental attitude: when confronted with a muscular challenge he simply could not muster the courage to face it. But instructors and other boys prodded him sympathetically and eventually he finished the course.

'It was the worst physical beating I had ever taken,' the boy says timidly. 'But it taught me that I could succeed.' The day we climbed the mountain, I said, 'I can't do it.' Today, the boy is on the honor roll at another school and is making plans for college.

Lawrence (1963) suggested that this training need not be confined to Outward Bound schools but that it can be incorporated into high school educational and athletic programs with equal success.

Lafontaine observed and participated in the first Outward Bound course for girls in this hemisphere. She (Lafontaine, 1966:66) described the aim of the Outward Bound experience as,

. . . strengthening the character by demanding a great deal of the body. As everyone knows, extraordinary circumstances, such as wars, elicit extraordinary performances from people who never guessed they were capable of them; William James even considered that humanity needed 'a moral equivalent of war' to tap these ultimate resources.

She went on to describe the exhausting, demanding nature of this program which involved confidence obstacles, a rope course, rock-climbing, rappelling, living in and with the environment, as well as group expeditions through the mountains and a marathon event involving canoeing, portage of the canoe overland, and ending with an endurance run of six miles. All of these experiences were then culminated with a three-day solo event in which the participants lived off the land for three days by themselves.

Lafontaine expressed her subjective evaluation of the worth of the program as follows,

. . . amazement at one's own achievement does a great deal for the self-respect, and true self-respect does a great deal for character. (Lafontaine, 1966:68)

None of us, I suspect, who was not an outdoors-woman before all this has become an outdoorswoman because of it, but that was never the point, in fact, whichever girl liked it the least has probably come off the best, having learned more than any of us what she is capable of. And that is the point. . . . We are better than we know. If we can be made to see it, perhaps for the rest of our lives we will be unwilling to settle for less. (Lafontaine, 1966:51)

Clifford and Clifford (1967) utilized a self-rating scale, self-description scale and an ideal description scale as well as a semantic differential, to examine the self-concepts of a group of adolescent boys before and after participation in an Outward Bound school summer camp and found that significant positive changes occurred. A control group was not utilized in this study, raising questions as to whether the results represent the effect of the experience or whether they could have been achieved simply through the passage of time or by participation in other pursuits. However, positive changes in self-concept did take place and discrepancies between the self and the ideal-self were reduced.

In a similar experiment, Stimpson and Pedersen (1970) found that a three week survival training experience significantly increased the self-concepts of a group of underachieving male high school students. The activities participated in during the three week experience included a 20-mile forced march, traversing an obstacle-like ropes course, a three day solo survival experience and a ten mile marathon race. Again,

no control group was utilized in this study and care must be taken in generalizing results because of the small sample size (only eight subjects were included in the study). The results do, however, indicate the possible benefits of activities involving challenge and stress.

Pickard (1968) described the types of activities that participants in Outward Bound engage in as follows: basic conditioning and skill development in camping and survival, rescue operations, first aid, fire fighting and service work, wilderness search and rescue, solo, patrol competition and a final expedition. At the beginning of the course, patrols of 9 to 12 individuals are established. Each patrol then goes through a series of progressively more difficult challenges, involving physical conditioning, camping, rope obstacle courses, rappelling, rock-climbing and mountain rescue techniques. Near the end of the course, each student enters the wilderness alone for the three day solo expedition. During this "solo" participants are allowed only a minimum of equipment, and are expected to "live off the land." The final expedition is done in groups of three to four, or sometimes with the entire patrol. It may involve a three or four day trek through the wilderness, requiring teamwork, cooperation, and a great deal of challenge. Depending upon the site of the school, this expedition may involve mountain climbing, sailing or trail-blazing through the wilderness. The group is required to map their route and completely plan the expedition.

Pickard (1968:22) stated,

Although the programs differ in specific details, depending upon the school's wilderness environment, all are designed to help young men discover the wonderful qualities they possess by putting them against a raw and impersonal nature. In facing up to the hardships and dangers of the mountains, wilderness or sea, the Outward Bound student gains a greater sense of self-reliance, a more profound feeling of inner strength.

Kelly and Baer (1971) conducted a study with delinquent adolescent boys in order to determine whether participation in an Outward Bound school would produce more favorable results than a traditional institutional experience in eliminating further delinquency and found that the rate of recidivism (return to juvenile institution or commitment to an adult institution for a new offense within one year after parole) in an experimental group which attended an Outward Bound school was 22% less than that of a comparison group that was treated routinely by juvenile authorities. Kelly and Baer (1971:440) stated that ". . . the opportunities for concrete impressive accomplishment, as well as for excitement and challenge, promote personal growth." The results of this study suggested that severe physical challenge may be an effective method of improving a delinquent's image of himself, as well as reducing recurrent delinquency in adolescent boys.

Positive changes in both self-concept and state and trait anxiety have been reported for male and female participants of a coeducational Outward Bound experience by Koepke

(1974). Koepke, however, did not utilize a control group in this study and the initial anxiety levels could have been higher because of anticipation of what was to follow, whereas the reported reductions could have been due to completion of the program, therefore reducing the anxiety caused by anticipation. This study does, however, offer further support for the hypothesis that stressful, challenging activity can be instrumental in the alteration of anxiety and self-concept.

Wetmore (1972) also found a significant positive change in the self-concept of adolescent boys who participated in an Outward Bound school. He utilized pre-tests and post-tests of the Tennessee Self-Concept Scale and student critiques by subjects six months following the end of the course. Instructors also completed the Osgood Semantic Differential (Osgood, Sacci and Tannenbaum, 1957) to rate the overt behavior of the subjects at the end of the course. Means for correlated samples were compared using t-tests to determine if a significant ($p < .05$) change in self-concept took place. Again, however, the sample used in this study was not matched with a control group, therefore, generalization of results is not possible.

Heaps and Thorstenson (1974) examined the effect of an outdoor survival course on self-concept, immediately after the course and again one year after the survival training. The initial 25 subjects (students at Brigham Young University)

were administered the Tennessee Self-Concept Scale (TSCS) prior to and immediately following participation in the survival experience, and 21 of these subjects (7 males and 14 females) were post-tested one year after completion of the course.

The survival experience itself was described as follows:

. . . an initial shakedown hike, without food or blankets, lasting two or three days; a group expedition in which the initial group was divided into two subgroups and specific physical-geographical goals were accomplished by each group; rappelling; a survival week living off the land; student expeditions wherein no escort was provided and small groups of students relied upon themselves to achieve outlined goals; and a solo experience, living alone for three days. (Heaps and Thorstenson, 1974:61)

Comparison of the pre-test and post-test self-concept scores for the original 25 subjects was accomplished through the use of t-tests. The total positive score (overall level of self-esteem) and scores on the other subscales of the TSCS were significantly improved after completion of the survival experience. These results were essentially repeated one year after participation in the experience, with the exception that the subjects' evaluation of themselves as family members dropped slightly. It should be pointed out that no control group was utilized in this study, the sample size was limited and two-thirds of the subjects for the follow-up testing were female. This would seem to put some limitations on the author's ability to generalize these

findings to other populations, however, it does provide interesting evidence as to the possible contribution to self-concept of programs of this type.

In another related study, Thorstenson, Heaps and Snow (1975) examined the effect of a twenty-nine day wilderness experience on anxiety and hearing sensitivity. A total of 46 subjects (28 females; 18 males) was utilized in the study. The survival experience was identical to that described previously by Heaps and Thorstenson (1974) in regard to the types of experiences presented. All subjects were administered the Taylor Manifest Anxiety Scale (MAS) (Taylor, 1953). Those who were classified as "high anxiety" subjects were requested to take hearing sensitivity tests. A total of 14 students took both the MAS and the hearing sensitivity tests. The subjects were given the anxiety scale immediately before and following the wilderness experience. The hearing sensitivity tests were also administered to the 14 "high anxious" subjects prior to and after the expedition. A two-way factorial analysis of variance revealed significant decreases in anxiety on the post-test scores and significant increases in hearing sensitivity. There were no significant differences between the scores of the male and female subjects.

Although Thorstenson, Heaps and Snow provided evidence of the efficacy of programs of this type in reducing anxiety, no control group was utilized for comparison. Since

subjects were tested just prior to participation in the program, it is possible that the pre-test scores reflected to some extent, their anxiety with regard to the survival program. This variable was not present during the post-test because they had already completed the survival experience, thus removing any threat it may have presented.

The popularity of these types of activities appears to be steadily growing. A number of colleges and universities have recognized the potential of this kind of physical activity and have modified and utilized the philosophy and techniques of Outward Bound schools to develop their own programs in an attempt to inject challenge, excitement, and real feelings of accomplishment into their physical education curriculums (Carlson, Gerald and Wignall, 1972; and Jones, Nye and Kemby, 1972).

PHYSICAL TRAINING

The notion that physical fitness and a healthy psyche are related is not new. As Collingwood and Willett have stated (1971:411-12), ". . . organizations such as Outward Bound, the YMCA, and the Boy Scouts have for some time emphasized the importance of 'sound mind--sound body' and that physical fitness is relevant to a healthier self-attitude." For example, positive changes in self-concept and psychological functioning have been noted in children with emotional disturbances, brain damage and mental retardation as a result

of an individualized physical development program. Johnson, Fretz and Johnson (1967) administered three measures of self-concept which were developed especially for the clinic program (the body, inter-personal relationships, and activity orientation) to 63 male and 11 female children who suffered from various types of mental and emotional infirmities. These self-concept measures were administered before and after participation in a specialized physical development program designed for the clinic.

The resulting data were analyzed with various t-tests and other appropriate techniques and revealed the following significant changes:

. . . a) decrease in self-self-ideal discrepancy on height, b) increase in willingness to be with larger groups of children, c) increase in willingness to be near the clinician, and d) increase in desire (self-ideal) to be near the father.
(Johnson, Fretz and Johnson, 1967:560)

The authors conceded in their presentation that their data, though encouraging, must be viewed tentatively until their instruments are further standardized, and again, no control group was utilized for comparisons.

Stamford, Hambacker and Fallica (1974) compared the effects of daily exercise on the psychiatric state of nine institutionalized mental patients with that of eight non-exercising patients who served as controls. The exercise was designed to elicit 70% of the predicted maximal heart rate for each subject and was accomplished by walking on a

tread-mill. Physiological evaluations were conducted on all subjects prior to and following the 12 week training period. The psychiatric evaluation consisted of a series of four psychological tests (Draw-a-person; Weschler Adult Intelligence scale (digit span test and general information test); a questionnaire designed specifically for patients residing at the Woodville State Hospital) also administered pre and post-training.

Physiological data were analyzed with an ANCOVA to determine changes in heart rate and blood pressure following the exercise training and the Mann-Whitney U Test was used to analyze the psychological data. Their results offered further support for the concept of an improved psyche accompanying the significantly enhanced physiological efficiency derived from participation in a physical exercise program.

A similar study examining the effects of jogging and cycling programs on physiological and personality variables in aged men was conducted by Buccola and Stone (1975). The subjects were 36 aged men (60-79 years) who were divided into two exercise groups and participated in a 14 week exercise program. For 16 subjects the exercise took the form of walk-jogging, and for 20 subjects it involved cycling. The subjects were pre and post-tested on a battery of physiological tests and the Cattell 16 Personality Factors Questionnaire. The results indicated a significant ($p < .05$) increase in predicted maximum oxygen uptake for both groups

and increased flexibility for the joggers. Significant ($p < .05$) decreases in blood pressure and weight were found for both groups and a decreased percent of body fat for the cyclers. The cyclers showed no change in any personality factors after the 14 week program but the walk-joggers became less carefree and more self-sufficient ($p < .05$). Comparisons between the groups after the program indicated that the cyclists expressed greater mental toughness and were more carefree than the joggers.

Collingwood and Willett (1971:412) tested five obese male teenagers before and after their participation in a three week physical training program, in order to assess the effects of physical training on personal attitudes. The following physical fitness measures were administered:

". . . (1) weight, (2) waist size, (3) resting pulse rate, (4) lung capacity, (5) Kraus Webber series of overall fitness, (6) balance tests, (7) chalk jump, (8) push-ups and (9) sit-ups." The subjects exercised in both a pool and gymnasium during the three week period and participated in jogging, calisthenics, and endurance swimming and skill exercises. A modification of Osgood's Semantic Differential was administered to each subject, as well as Bill's Index of Adjustment and Values. These tests were administered before and after the three week program and the results indicated that the subjects demonstrated significant increases in physical fitness test scores, self-concept, self-acceptance, positive

body attitude and a significant decrease in the discrepancy between real and ideal self.

In a follow-up to Collingwood and Willett's study, utilizing the same testing instruments, Collingwood (1972) utilized an experimental and a control group and obtained similar results with 25 young male rehabilitation clients who had participated in a four week physical training program.

In regard to the effects of physical activity on anxiety, deVries (1966) found a decrease in neuro-muscular tension in the elbow flexors after bench step exercise. This lends some support to the hypothesis that exercise can be effective in aiding the process of relaxation. In a second study, deVries and Adams (1972) found that exercise significantly reduced the electrical activity in the skeletal musculature, while the administration of a tranquilizer (meprobamate) did not produce equivalent effects. These findings suggest that exercise may be more effective than some of the more commonly utilized methods in reducing excess bodily tension.

Morgan and Hammer (1974) studied the influence of competitive wrestling upon state anxiety. Cattell and Scheiers IPAT-8-Parallel-Form Anxiety Scale was administered four times to 29 college wrestlers. The first administration was early in the wrestling season; the second was four hours prior to a major competition; the third was one hour prior to this major competition; and the fourth was shortly after

the wrestlers had completed their competition. Analysis of the data through multi-factor ANOVA procedures indicated that anxiety increased significantly as the competition approached, but was significantly reduced upon completion of the competition.

SUMMARY

The primary contention of the V.M.I. "Rat" training program is that it stresses and tests the physical capabilities of the cadets to show them that their capabilities are beyond any personal limits they may have previously established for themselves. The program is similar to Outward Bound, in that it functions in terms of experience, action, and activities, which encourage self-confrontation and personal growth. It has been postulated that participation in the "Rat" training program may enhance an individual's self-concept and reduce his anxiety.

The self-concept can be defined in terms of the phenomenological self, which is the organization of all the ways an individual has of seeing himself. How an individual feels about himself is significant because it may have a great influence on how he subsequently functions.

The research reviewed supports the view that self-concept is an alterable construct. Several studies involving the effect of survival and other training methods similar to Outward Bound, (Clifford and Clifford, 1967; Stimpson and

Pedersen, 1970; Wetmore, 1972; and Koepke, 1974) have demonstrated positive results in this regard, but the lack of a control group with which to make comparisons, limits the generalizability of these studies. Intense experiences such as "Rat" training may be related to what Maslow terms "peak experiences." These "peak experiences," according to Maslow, can favorably change a person's view of himself and his powers of expressiveness and creativity.

It has been noted that anxiety is an emotion related to fear. It may be associated with the presence of threat or danger that is not immediate but that may occur or might occur. Spielberger has differentiated two distinct types of anxiety. State anxiety, or arousal of anxiety feelings associated with a particular threatening situation, and trait anxiety, which is a relatively stable measure indicating an individual's level of predisposition to respond to threatening situations with increased state anxiety reactions.

A relationship between self-esteem and anxiety has been demonstrated. Rosenberg indicated that the lower a subject's self-esteem level, the more likely he is to experience anxiety. Inordinate amounts of anxiety may become debilitating if not relieved and interfere with the normal, efficient functioning of the individual.

Several studies (Freeman and Kendrick, 1960; Grossberg, 1965; Walton and Mather, 1963) have indicated that anxiety, like self-concept, is an alterable construct.

Individuals have been "desensitized" to objects and situations which caused them anxiety, by being systematically and progressively exposed to the anxiety producing stimulus or situation.

One study (Fenz and Epstein, 1969) indicated that experience in a stressful activity may be a factor in limiting or controlling anxiety and two studies (Thorstenson, Heaps and Snow, 1975; and Koepke, 1974), dealing with the effects of Outward Bound and similar programs on anxiety, have demonstrated positive results. As with those studies involving self-concept in this regard, however, the methodologies did not always provide a control group with which to make comparisons, and some experimental populations were limited in number or to one gender, making causal relationships and broad generalizations difficult to determine. The effect of physical activity and conditioning on anxiety and self-concept has been dealt with in several studies (Collingwood and Willett, 1971; deVries, 1968; deVries and Adams, 1972; Johnson, Fretz and Johnson, 1967; Morgan and Hammer, 1974), with the results supporting the premise that increased physical fitness or ability may have a positive effect on both self-concept and anxiety.

The V.M.I. "Rat" training program is based upon the principles espoused by the Outward Bound organization, but has been modified to accommodate the routine and schedule of college life. Subjective evaluations of the value of programs

of this type are common among physical educators and in the literature. However, no studies were found that dealt with the effectiveness of programs modified for the college or university setting. This study has been undertaken to investigate the effect of a modified program of this type (V.M.I. "Rat" training) on the self-concept and anxiety of male military college students.

Chapter 3

PROCEDURES AND METHODOLOGY

This chapter is divided into three main sections: the sample, the testing instruments and the statistical treatment and procedures.

THE SAMPLE

The sample included 75 freshman cadets at the Virginia Military Institute who were randomly selected from the freshman class. However, no athletes in season, scholarship athletes, or individuals receiving ROTC scholarships were included in the sample. The selected subjects were then randomly assigned to one of five groups of 15 subjects per group. Experimentation was conducted utilizing a Solomon counter-balanced design (Ary, Jacobs, Razavieh, 1972), with the experimental groups assigned as indicated in Table 1.

A. The "Rat" Training Experimental Group (RTE) was administered a pre-test of the Tennessee Self-Concept Scale (TSCS) (Appendix A) one day prior to initial participation in the "Rat" training program. The subjects reported to a lecture room and were informed that they had been randomly selected as participants in a study being conducted, but they were not informed as to the nature or purpose of the study. They were then instructed to complete a self-

TABLE 1

ASSIGNMENT OF EXPERIMENTAL GROUPS UTILIZING A
SOLOMON COUNTER-BALANCED DESIGN

	<u>PRE</u>		<u>TREATMENT</u>		<u>POST</u>
Group (RTE):	R . . SC ₁ . . A ₁		X	A ₂ . .	SC ₂
Group (RTC):	R		X	A ₁ . .	SC ₁
Group (GSE):	R . . SC ₁ . . G ₁ . . A ₁ . .		X . . SC ₂ . . G ₂ . .	A ₂	
Group (GSC):	R		X . . G ₁ . . A ₁ . .		SC ₁
Group (C):	R . . SC ₁ . . A ₁		C	A ₂ . .	SC ₂
Group (RTE)	= "Rat" training experimental group				
Group (RTC)	= "Rat" training control group for sensitization effects of the pre-test on post-test scores				
Group (GSE)	= Gas stressor experimental group				
Group (GSC)	= Gas stressor control group for sensitization effects of the pre-test on post-test scores				
Group (C)	= Control group not participating in "Rat" training or the gas chamber exercise				
R	= Randomization of Assignment to Group				
SC ₁	= Pre-test of TSCS				
SC ₂	= Post-test of TSCS				
A ₁	= Pre-test of STAI				
A ₂	= Post-test of STAI				
G ₁	= First threat of exposure to gas				
G ₂	= Second threat of exposure to gas				
X	= Treatment ("Rat" training)				
C	= No treatment				

evaluation questionnaire (TSCS), according to the instructions contained in the test booklet. A pre-test of the State-Trait Anxiety Inventory (STAI) (Appendix B) was administered to this group immediately prior to their initial participation in the "Rat" training program. The group was informed that they were about to begin participation in "Rat" training, and that the program was designed to stress their physical and emotional capabilities to their utmost. They were then informed that during "Rat" training they would participate in the following strenuous and demanding activities:

1. Rifle exercises
2. Circuit training
3. Pugil stick training
4. Confidence obstacles
5. Rappelling
6. The "slide-for-life" zip wire
7. Individual combative techniques
8. A river crossing
9. Endurance running
10. A forced march over "House" mountain
11. A stamina course
12. Log exercises

The group was then administered the self-evaluation questionnaire (STAI) according to the instructions on the test sheet.

A post-test of the State-Trait Anxiety Inventory was administered after 11 weeks participation in the "Rat" training program and just prior to participation in training activities. The conditions and instructions for this test were identical to those of the pre-test. A post-test of the Tennessee Self-Concept Scale was administered one day after the post-test of the STAI, and under the same conditions as the pre-test. The purpose of this experimental group was to determine the effect of the "Rat" training program on the self-concepts and state and trait anxiety of participants.

B. The "Rat" Training Control Group (RTC) was not pre-tested but participated in the 11 week training program. The purpose of not pre-testing this group was to control for any sensitization of the pre-tests for the RTE group on post-test scores. A post-test of the STAI was administered at the same time and under the same conditions as the post-test administered to the "Rat" Training Experimental Group. A post-test of the TSCS was administered one day after the post-test of the STAI.

C. The Gas Stressor Experimental Group (GSE) was administered a pre-test of the Tennessee Self-Concept Scale at the same time and under the same conditions as the RTE group. They were administered the State-Trait Anxiety Inventory immediately prior to participation in a military gas chamber exercise and prior to their initial participation in "Rat" training. The group was transported to a testing

site and informed as to the nature of the exercise in which they would be participating. They were then instructed in the proper use of the M-17 field protective gas mask and a mask inspection and drill were performed (FM 21-48, Department of the Army: 1973). The group was told that they would place the masks on prior to entering the gas chamber (a general-purpose medium tent) and would then enter in single file and become exposed to a concentration of CS (tear) gas. They were instructed that they would form a circle and breathe normally for several minutes, at which time they would proceed to the instructor near the exit, remove the gas mask, state their name, class year and school, and exit the chamber. They were also informed as to the possible physiological effects of the gas and how to properly care for their eyes and clothing following their exposure. After these instructions, the group was asked to complete a self-evaluation questionnaire (STAI) according to the instructions on the test sheet.

A post-test of the Tennessee Self-Concept Scale was administered to the Gas Stressor Experimental Group after participation in 11 weeks of "Rat" training, but prior to their post-test with the State-Trait Anxiety Inventory. The instructions for this test were the same as those for the pre-test. Following this, a post-test of the State-Trait Anxiety Inventory was administered immediately prior to what appeared to be a second exposure to the gas chamber. All

procedures and instructions were the same as for the pre-test, but the group was not required to go through the gas chamber a second time, simply led to believe that was the case. The purpose of this group was to determine the effect of "Rat" training on the self-concepts of participants and also to determine its effect on state anxiety produced by a general stressor (gas chamber).

D. The Gas Stressor Control Group was not pre-tested, but participated in 11 weeks of "Rat" training, and was administered a post-test of the State-Trait Anxiety Inventory immediately prior to participation in a gas chamber exercise identical to that participated in by the GSE group. A post-test of the Tennessee Self-Concept Scale was administered one day after the gas chamber exercise. The purpose of this group was to control for sensitization effects of the pre-tests for the GSE group on post-test scores.

E. The Control Group received pre and post-tests of the Tennessee Self-Concept Scale and State-Trait Anxiety Inventory according to the same schedule as the RTE group. They did not, however, participate in the eleven weeks of "Rat" training, and were simply administered the two instruments according to the instructions in the test booklets.

DATA COLLECTION INSTRUMENTS

The measurement instruments selected for this research effort were Spielberger's State-Trait Anxiety Inventory (1970)

and the Tennessee Self-Concept Scale by Fitts (1965).

The State-Trait Anxiety Inventory (STAI)

The State-Trait Anxiety Inventory is an instrument that can be utilized to study anxiety in emotionally stable adults and secondary school students as well as patients suffering from emotional and physical infirmities (Spielberger, Gorsuch and Lushene, 1970). The STAI measures both "state" and "trait" anxiety. These two anxiety concepts have been previously described and defined in this dissertation. The two scales on the STAI were described (Spielberger, Gorsuch, and Lushene, 1970:3) as follows:

The STAI A-Trait scale consists of twenty (20) statements that ask people to explain how they generally feel. The A-State scale also consists of twenty (20) statements, but the instructions require subjects to indicate how they feel at a particular moment in time. These scales are printed on opposite sides of a single test form.

Subjects rate themselves on a four point scale for each item on the STAI. The maximum possible score on either scale is 80, while the minimum scores is 20. Spielberger, Gorsuch, and Lushene (1970:4-5) described the four categories of responses for the two scales as follows:

The four categories for the A-State scale are: (1) Not at all; (2) Somewhat; (3) Moderately so; and (4) Very much so. The categories for the A-Trait scale are: (1) Almost never; (2) Sometimes; (3) Often; and (4) Almost always.

Scoring weights have been adjusted to account for differences in the wording of some items which cause a rating

of (4) to indicate a high level of anxiety on some responses, and a low level of anxiety on others. (Spielberger, Gorsuch and Lushene, 1970).

Reliability of the State-Trait Anxiety Inventory

Various groups were examined with the STAI in order to determine its reliability as a measure of anxiety. Spielberger, Gorsuch and Lushene (1970:9) described these groups as follows:

In the development and standardization of the STAI, a total of over 3,300 high school and college students were tested. In addition, normative data were obtained on more than 600 neuropsychiatric and medical patients and for approximately 200 young prisoners.

Test-re-test correlations with both the A-Trait and A-State scales have produced evidence supporting the reliability of the STAI. As Spielberger, Gorsuch and Lushene (1970:9) have indicated,

. . . test-re-test correlations for the A-Trait Scale were reasonably high, ranging from .73 to .86, while those for the A-State Scale were relatively low, ranging from .16 to .54, . . . The correlations for the A-State Scale were anticipated, of course, because a valid measure of A-State should reflect the influence of unique situational factors existing at the time of testing.

Spielberger, Gorsuch and Lushene make no mention of controlling the conditions or situations under which these students were tested, which would further explain the low correlations found with the State Anxiety Scale. Calkins (1976) conducted an unpublished study in which the testing

situation was controlled and kept identical on both the pre-test and the post-test and found that the test-re-test correlation under these conditions was .69.

Spielberger (1970:9-10) further evaluated the scale to provide evidence supporting its internal consistency and explained his results as follows:

Given the transitory nature of anxiety states, measures of internal consistency such as the alpha coefficient would seem to provide a more meaningful index of the reliability of State Anxiety Scales than test-re-test correlations. Alpha coefficients for the STAI scales were computed by formula KR-20 as modified by Cronbach for the normative samples. These reliability coefficients ranged from .83 to .92 for State Anxiety and those for Trait Anxiety were equally high. Thus, the internal consistency of both STAI subscales is reasonably good.

Validity of the State-Trait Anxiety Inventory

In the development of this scale, every item was required to meet designated "state" and "trait" anxiety validity standards or it was not retained. Correlations between the STAI A-Trait Scale and other measures of anxiety (IPAT Anxiety Scale; Taylor Manifest Anxiety Scale; and the Zuckerman Affect Adjective Check List) range from .52 to .83. Data are also available that support the validity of the A-State Scale. It has been demonstrated that this scale adequately reflects differing levels of "state" anxiety under different conditions involving various degrees of stress (Spielberger, Gorsuch and Lushene, 1970).

The Tennessee Self-Concept
Scale (TSCS)

This instrument was designed to measure individual self-perceptions (Fitts, 1965). It provides scores on nine (9) personality characteristics concerning the self, and one score referred to as the "Total Positive Score," which reflects an individual's overall level of self-esteem (Wetmore, 1972).

In the development of the TSCS, self-descriptions of mental patients and non-patients as well as details from other instruments designed to measure self-concept were utilized to assemble an aggregate of self-descriptive items. These items were examined and categorized by seven clinical psychologists and were then assigned to the 3 x 5 classification scheme employed on the score sheet of the scale. This 3 x 5 scheme includes three rows classifying items in terms of how the individual perceives himself regarding:

- (1) Identity (What he is)
- (2) Self-Satisfaction (How he accepts himself)
- (3) Behavior (How he acts)

In addition, the scheme includes five columns classifying items in terms of how an individual perceives himself in relation to:

- (1) Physical Self
- (2) Moral-Ethical Self
- (3) Personal Self

(4) Family Self

(5) Social Self

There are 90 items on the scale which were evaluated as being either positive or negative in content and were equally divided on that basis. No items were retained on the scale unless there was unanimous agreement by the seven psychologists. The remaining 10 items on the scale were taken from the L-Scale of the Minnesota Multiphasic Personality Inventory and comprise the Self-Criticism Score (Fitts, 1965).

There are ten scores on the scale and Fitts (1965: 2, 3) has defined each of these scores as follows:

1. Self-Criticism Score. This scale is composed of 10 items. These are all mildly derogatory statements that most people admit as being true for them. Individuals who deny most of these statements most often are being defensive and making a deliberate effort to present a favorable picture of themselves. High scores generally indicate a normal, healthy openness and capacity for self-criticism. Extremely high scores (above the 99th percentile) indicate that the individual may be lacking in defenses and may in fact be pathologically undefended. Low scores indicate defensiveness, and suggest that the positive scores are probably artificially elevated by this defensiveness.

2. Total Positive Score. This is the most important single score on the form. It reflects the overall level of self-esteem. Persons with high scores tend to like themselves, feel that they are persons of value and worth, have confidence in themselves, and act accordingly. People with low scores are doubtful about their own worth; see themselves as undesirable; often feel anxious, depressed and unhappy; and have little faith or confidence in themselves.

3. Identity Score. These are the 'What I am' items. Here the individual is describing his basic identity--what he is as he sees himself.

4. Self-Satisfaction Score. This score comes from those items where the individual describes how he feels about the self he perceives. In general this score reflects the level of self-satisfaction or self-acceptance.

5. Behavior Score. This score comes from those items that say 'this is what I do or this is the way I act.'

6. Physical Self Score. Here the individual is presenting his view of his body, his state of health, his physical appearance, skills and sexuality.

7. Moral-Ethical Self Score. This score describes the self from a moral-ethical frame of reference--moral worth, relationship to God, feelings of being a 'good' or 'bad' person, and satisfaction with one's religion or lack of it.

8. Personal Self Score. This score reflects the individual's sense of personal worth, his feeling of adequacy as a person and his evaluation of his personality apart from his body or his relationship to others.

9. Family Self Score. This score reflects one's feelings of adequacy, worth, and value as a family member. It refers to the individual's perception of self in reference to his closest and most immediate circle of associates.

10. Social Self Score. This is another 'Self' as perceived in relation to others category, but pertains to 'others' in a more general way. It reflects the person's general sense of adequacy and worth in his social interaction with other people in general.

The Total Positive Score is computed by adding either the row or column totals for positive scores (Fitts, 1965). As it is a reflection of an individual's overall level of self-esteem, it is the single score that was utilized in this study in regard to self-concept.

Reliability of the Tennessee Self-Concept Scale

The test-re-test reliability coefficients of the 10 scores for the TSCS range from .75 to .92. The test-re-test reliability coefficients for total positive scores is .92 (Fitts, 1965). Repeated measures testing has also substantiated the reliability of the scale as indicated by Fitts' (1965:15) statement that,

Other evidence of reliability is found in the remarkable similarity of profile patterns found through repeated measures of the same individuals over long periods of time. Through various types of profile analyses the author has demonstrated that the distinctive features of individual profiles are still present for most persons a year or more later.

Validity of the Tennessee Self-Concept Scale

Fitts (1965:17) indicated the utilization of four types of validation procedures: ". . . content validity, discrimination between groups, correlation with other personality measures, and personality changes under particular conditions."

He stated the following in regard to content validity: "the purpose here has been to insure that the classification system used for the Row Scores and Column Scores is dependable." (Fitts, 1965:17). It has previously been noted that 90 items of the self-concept scale were derived from other measures of self-concept as well as from the self-descriptions of mental patients and non-patients. The ten items

forming the Self-Criticism Scale were taken from the L-Scale of the Minnesota Multiphasic Personality Inventory. All items were examined by a group of clinical psychologists who determined whether or not an item was to be retained on the scale (Fitts, 1965).

Ary, Jacobs and Razavieh (1972:192) stated,

Content validity is essentially and of necessity based on judgment. The test maker may ask a number of experts to examine the items systematically and indicate whether or not they represent sufficiently well the theoretical universe from which they were drawn.

This criterion for content validity then, appears to have been adequately established.

Data generated from personality research have suggested that groups with differing psychological profiles will also differ in self-concept. The ability of the Tennessee Self-Concept Scale to discriminate between such groups was shown in a study comparing a group of psychiatric patients (N=369) with a group of "normals" (N=626). Statistical analyses revealed significant differences between these two groups on most of the scores utilized on the scale (Fitts, 1965).

As Fitts (1965:21) has indicated, "self theory would lead us to expect predicted self-concept differences in groups whose behavior is different." Differences of this sort have been found utilizing this scale, between delinquents and non-delinquents, between juvenile first offenders

and repeated offenders and between unwed mothers and norm groups (Fitts, 1965).

This ability to discriminate between groups is sometimes called concurrent validity and is described by Ary, Jacobs, and Razavieh (1972:196) as follows:

Concurrent validity has a purpose in its own right and is the appropriate type of validity for certain psychological tests. Concurrent validity is important for those tests designed for use in the diagnosis of existing status, rather than for the prediction of future outcomes. The Minnesota Multiphasic Personality Inventory (MMPI) was developed to identify a number of categories of abnormal behavior. The validity study for this test included the administering of the instrument to a number of hospitalized mental patients and a group of 'normal' individuals. The extent to which the test could distinguish between normals and mental patients provided an indication of the concurrent validity of the MMPI.

Fitts (1965:24) has indicated that "another way to assess validity is to determine the correspondence between scores on the Scale and other measures for which correlations should be predicted." Data of this type are available for such instruments as the MMPI and the Edwards Personal Preference Schedule (EPPS), as well as other personality measures. The demonstrated correlations provide further support for the validity of the TSCS (Fitts, 1965).

The TSCS has also been utilized to examine the theory that certain influential experiences may have an effect upon the way an individual perceives himself. Thorstenson, Heaps, and Snow (1974) utilized the TSCS to examine the effect of an outdoor survival course on self-concept, immediately and

one year after the survival training. The TSCS was administered to the subjects prior to, immediately after and one year after their survival expedition and scores were compared through the utilization of t-tests. The results showed that the total positive score and the scores for the other sub-scales following the expedition were significantly higher than before the survival experience. These results were essentially repeated one year after participation in the experience.

Wetmore (1972) also utilized the TSCS to measure self-concept change in adolescent boys who attended an Outward Bound school. He administered pre-tests and post-tests of the TSCS prior to and immediately following completion of the course. Means for correlated samples were compared utilizing t-tests to determine if a significant ($p < .05$) change in self-concept took place. The results showed that a significant positive change in the self-concepts of the participants had occurred after participation in the Outward Bound experience.

Fitts (1965) has indicated that numerous studies have dealt with the self-concept as a standard for evaluating personality change, and personality theorists such as Maslow (1968) have indicated that certain "peak experiences" in a person's life may be able to substantially alter his perceptions and attitudes toward himself. The TSCS has been

utilized to measure and has reflected such change, thus providing additional support for the validity of the instrument.

In a test review in the Journal of Counseling Psychology, Crites (1965:330-331) commented on the validity data of the scale as follows:

It tends to meaningfully discriminate psychiatric groups from normals and different psychiatric groups from each other. In addition, it correlates as might be expected with other personality inventories, such as the MMPI and EPPS. And, there is some evidence that certain scores change in predicted ways as a result of psychotherapy and other relevant experiences. It can be concluded, therefore, that the initial data on the scale's psychometric attributes indicate that it 'measures up' by traditional criteria rather well.

STATISTICAL TREATMENT

After all subjects completed testing, the instruments were scored and a statistical analysis of the total positive scores (TSCS) and "state" and "trait" anxiety scores was done using a Groups x Tests analysis of variance with repeated measures on the latter factor (Groups RTE, GSE, and C) and a one-way analysis of variance on the post-test scores (Groups RTE, RTC, GSE, GSC and C). The significance of differences between post-test group mean scores on the instruments was determined as well as any sensitization effects of the pre-test on post-test data. Additionally, the effects of the treatment on groups RTE, GSE, and C were examined and comparisons made. Where significant differences were found through ANOVA ($p < .05$), the Scheffé test was used to locate the specific cell mean differences causing the significance.

SUMMARY

The procedures and methodology utilized in this research effort were as follows:

A random sample of 75 freshman cadets at the Virginia Military Institute was selected as subjects for the study. These 75 subjects were then randomly assigned to one of five groups of 15 subjects per group. No athletes in season, scholarship athletes, or individuals receiving ROTC scholarships were included in the sample.

Experimentation was conducted utilizing a Solomon counter-balanced design, with group C serving as the primary control group. Pre and Post-tests of the Tennessee Self-Concept Scale and the State-Trait Anxiety Inventory were administered to groups RTE, GSE and C prior to and after participation in the "Rat" training program, but group C was a control group and did not participate in the training program. Groups RTC and GSC were administered post-tests of the two instruments and served as controls for the sensitization effects of the pre-testing, for groups RTE and GSE, respectively.

Additionally, groups GSE and GSC were exposed to a military gas chamber exercise and were administered the State-Trait Anxiety Inventory just prior to this exposure. Group GSE was pre and post-tested in this situation, before and after participation in the "Rat" training program. Group GSC received only a post-test.

After all subjects had completed testing, a statistical analysis was done using a two-way analysis of variance for repeated measures across one factor (Groups RTE, GSE and C) and a one-way analysis of variance for independent groups on the post-test scores (Groups RTE, RTC, GSE, GSC, and C). The significance of differences between post-test group mean scores on the two instruments was determined as well as any sensitization effects of the pre-test on post-test data. Additionally, the effects of the treatment on groups RTE, GSE and C were examined and comparisons made. When significant differences were found through ANOVA ($p < .05$), the Scheffé test was utilized to locate the specific cell mean differences causing the significance.

The purpose of each group in the design was as follows:

(1) The "Rat" Training Experimental Group (RTE) was utilized to determine the effect of the V.M.I. "Rat" training program on the self-concepts and state and trait anxiety of participants.

(2) The "Rat" Training Control Group (RTC) was utilized to control for sensitization effects of the pre-tests for the RTE group, on post-test scores.

(3) The Gas Stressor Experimental Group (GSE) was utilized to determine the effect of participation in the program on the participants' self-concepts, and also to determine its effect in reducing anxiety in regard to a

stressful military activity (exposure to a gas chamber) which was dissimilar to the training program activities.

(4) The Gas Stressor Control Group (GSC) was utilized to control for sensitization effects of the pre-tests for the GSE group, on post-test scores.

(5) The Control Group (C) was utilized as the primary control group, in order to make comparisons regarding the effect of the training program on self-concept and state and trait anxiety.

Chapter 4

PRESENTATION AND DISCUSSION OF DATA

The data concerning the effect of the Virginia Military Institute (V.M.I.) "Rat" training program on the self-concepts and "state" and "trait" anxiety of participants are presented and discussed in this chapter. The chapter was divided so that a brief description of the experimental groups is initially presented, followed by presentations of the data regarding self-concept, "state" anxiety, and "trait" anxiety. The chapter concludes with a discussion of the data presented.

The five groups utilized in this study were designated as follows:

1. The "Rat" Training Experimental Group (RTE) (N=13).
2. The "Rat" Training Control Group (RTC) (N=14).
3. The Gas Stressor Experimental Group (GSE) (N=12).
4. The Gas Stressor Control Group (GSC) (N=15).
5. The Primary Control Group (C) (N=14).

Although there were originally 15 subjects in each of these groups, seven subjects were removed from the study for various reasons. Two subjects from the RTE group left school prior to completing the "Rat" training program, as did one subject each from the RTC group and the C group. Three subjects were removed from the GSE group; two who did not complete "Rat"

training because they were erroneously permitted to become members of varsity athletic teams mid-way through the "Rat" training program, and one who was found to be medically unqualified to participate in the gas chamber exercise. Thus, a total of 68 subjects was utilized in the study.

SELF-CONCEPT DATA

All subjects in the RTE, GSE, and C groups were tested prior to and after 11 weeks participation in the "Rat" training program with the Tennessee Self-Concept Scale (TSCS). The pre-test and post-test scores for these three groups were examined utilizing a Groups x Tests analysis of variance with repeated measures on the latter factor. The mean pre-test and post-test scores for the RTE, GSE and C groups are shown in Figure 1 and graphically indicate that only small mean changes in self-concept took place. The results of the Groups x Tests analysis of variance with repeated measures on the latter factor are shown in Table 2. The obtained F ratios demonstrated an absence of statistical significance for both main and interaction effects, indicating that no significant differences existed either between mean group scores or between pre-test and post-test mean scores. The RTC and GSC groups received only post-tests of the TSCS, and the post-test scores of all five groups were compared utilizing a one-way analysis of variance. The post-test mean self-concept scores of all five groups are presented in Figure 2.

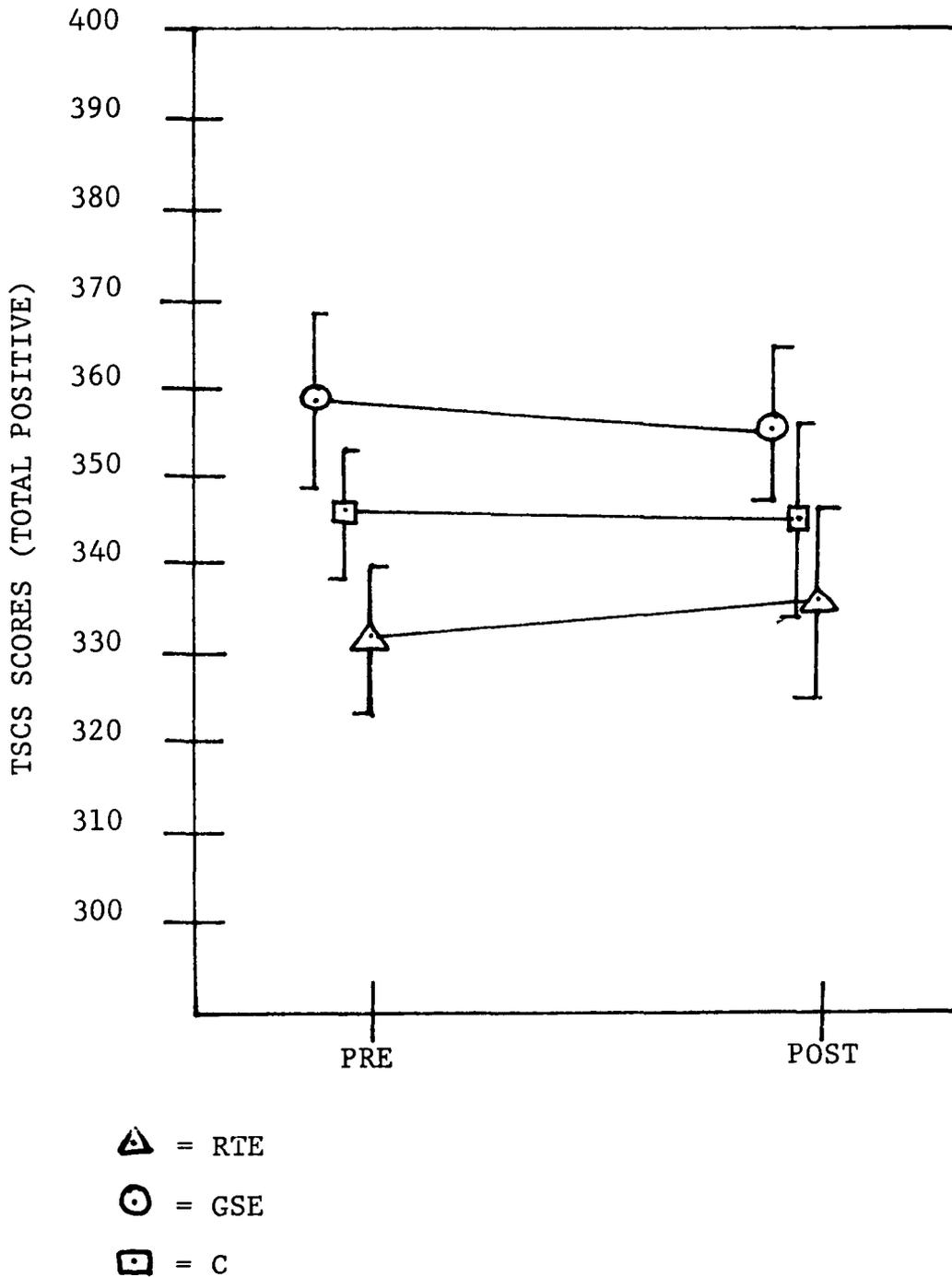


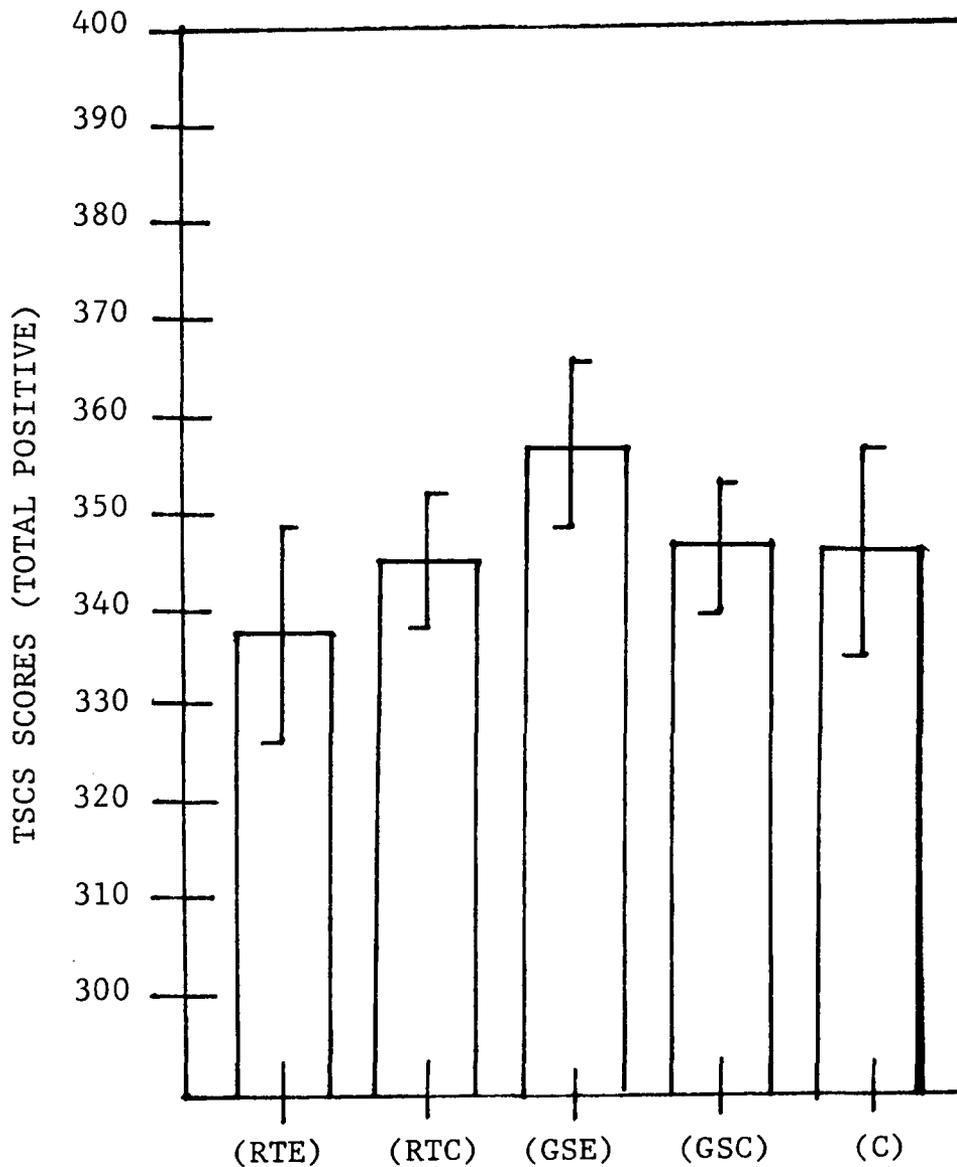
Figure 1. Comparison of Pre-Test and Post-Test Total Positive Tennessee Self-Concept Scores for Groups RTE, GSE and C, Showing the Mean (\bar{X}) Plus and Minus One Standard Error of the Mean ($SE_{\bar{X}}$).

TABLE 2

SUMMARY OF THE GROUPS X TESTS ANOVA WITH REPEATED
MEASURES ON THE LATTER FACTOR FOR THE
TENNESSEE SELF-CONCEPT SCALE

Source	SS	df	MS	F
Model	79548.90	41	1940.2	8.19
Error	8529.47	36	236.93	
Total	88078.37	77		

Group	5951.57	2	2975.78	1.46
Subj (Group)	73489.30	36	2041.37	
Tests	0.01	1	0.01	0.00
Group x Tests	108.02	2	54.1	0.23



RTE = Rat Training Experimental Group
 RTC = Rat Training Control Group
 GSE = Gas Stressor Experimental Group
 GSC = Gas Stressor Control Group
 C = Control Group

Figure 2. Comparison of Post-Test Total Positive Tennessee Self-Concept Scores for Groups RTE, RTC, GSE, GSC and C, Showing the Mean (\bar{X}) Plus and Minus One Standard Error of the Mean ($SE_{\bar{X}}$).

It can be seen that little difference existed among groups. The results of the one-way analysis of variance on post-test self-concept scores are shown in Table 3. The F ratio obtained indicated an absence of statistically significant differences between the post-test mean self-concept scores of the five groups. Since the RTC and GSC groups were utilized to control for the sensitization of the pre-test on post-test scores for the RTE and GSE groups, these data suggest that no such desensitization took place. Thus, taken together, the results indicate that participation in the V.M.I. "Rat" training program did not positively alter the self-concepts of participants over those of non-participants.

"STATE" ANXIETY DATA

Reduction of "State Anxiety to Activities Specific to the "Rat" Training Program

All subjects in the RTE, GSE, and C Groups were administered a pre-test and post-test on the State-Trait Anxiety Inventory (STAI), prior to and after 11 weeks participation in the "Rat" training program. Statistical analyses identical to those utilized to examine the TSCS scores were utilized to examine the "state" anxiety scores of these three groups as well as to examine the post-test "state" anxiety scores of all five groups.

TABLE 3

SUMMARY OF ONE-WAY ANOVA ON POST-TEST
SCORES FOR THE TENNESSEE SELF-CONCEPT SCALE

Source	SS	df	MS	F
Between	2290.40	4	572.60	0.56
Within	64264.82	63	1020.08	

Total	66555.22	67		

The mean pre-test and post-test "state" anxiety scores for the RTE, GSE and C groups are shown in Figure 3. It can be seen that post-test mean "state" anxiety scores were lower than pre-test mean scores. In addition, while the RTE group did not demonstrate a reduction in anxiety on the post-test, the GSE and C groups both demonstrated reductions in post-test "state" anxiety. The results of the Groups x Tests analysis of variance with repeated measures on the latter factor are shown in Table 4. Statistically significant ($p < .05$) F values were found for both Groups, $F(2,36)=7.08$ and Tests, $F(1,36)=5.12$ in the two-way analysis of variance. However, the Groups x Tests interaction failed significance, $F(2,36)=2.07$. The Scheffé test, utilized to determine which group mean differences were responsible for the significant main effect of Groups, revealed a significant difference between only the RTE and GSE groups.

The post-test mean "state" anxiety scores of all five groups are presented in Figure 4. Substantial differences are demonstrated between the RTE group and the GSE group and between the RTC group and the GSE group. There is also a considerable difference demonstrated between the RTE group and the GSC group. The one-way analysis of variance on the post-test "state" anxiety scores of all five groups (Table 5) revealed a significant difference, $F(4,63)=7.09$, $p < .05$. The Scheffé test used to evaluate the source of differences between groups revealed that significant

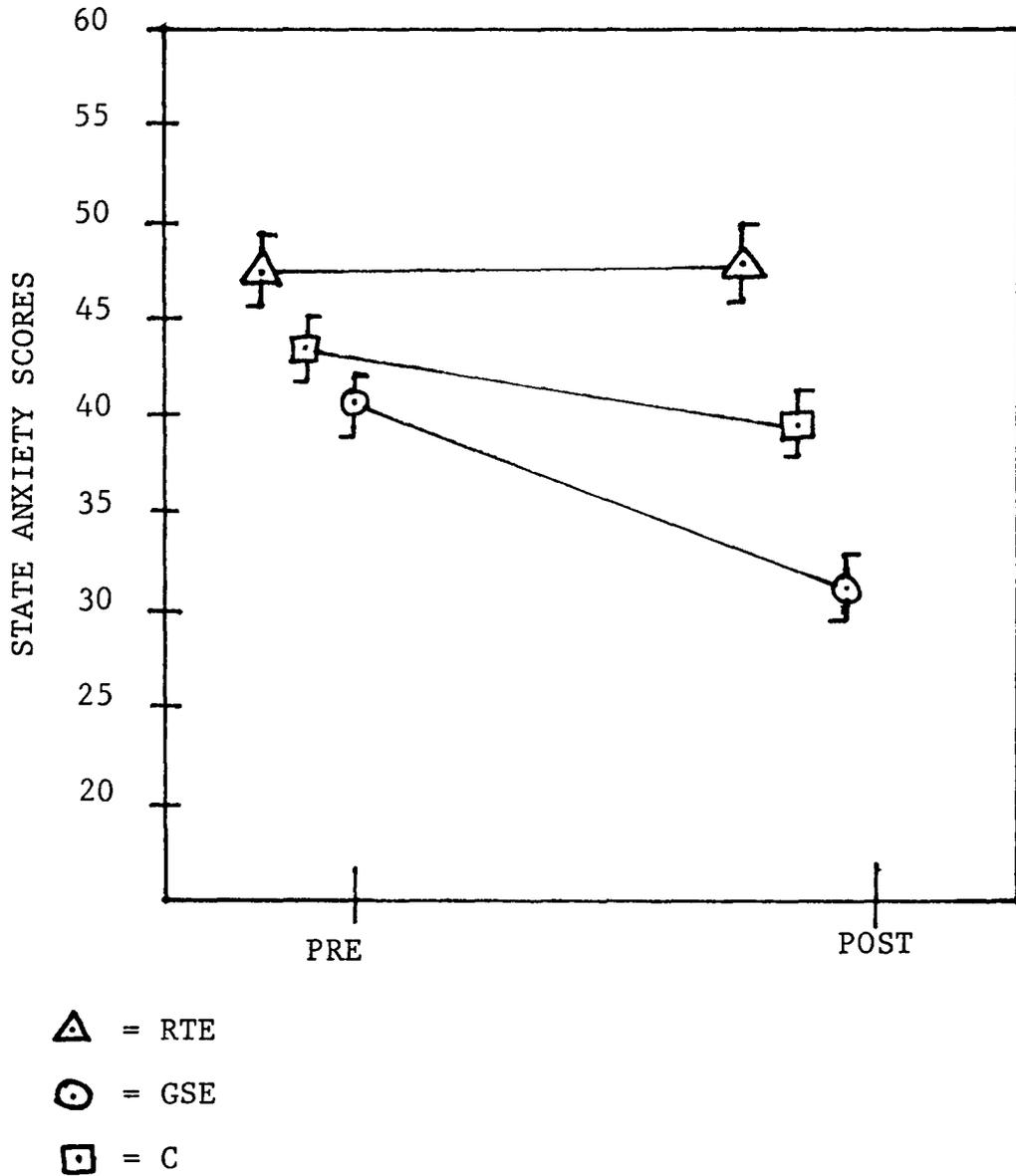


Figure 3. Comparison of Pre-Test and Post-Test State Anxiety Scores for Groups RTE, GSE, and C, Showing the Mean (\bar{X}) Plus and Minus One Standard Error of the Mean ($SE_{\bar{X}}$).

TABLE 4

SUMMARY OF GROUPS X TESTS ANOVA WITH REPEATED MEASURES ON
THE LATTER FACTOR FOR THE STAI (STATE)

Source	SS	df	MS	F
Model	6970.70	41	170.02	1.75
Error	3496.29	36	97.12	
Total	10466.99	77		

Group	1713.44	2	856.72	7.08*
Subj (Group)	4358.05	36	121.06	
Tests	497.55	1	497.55	5.12*
Group x Tests	401.66	2	200.83	2.07

*
p < .05

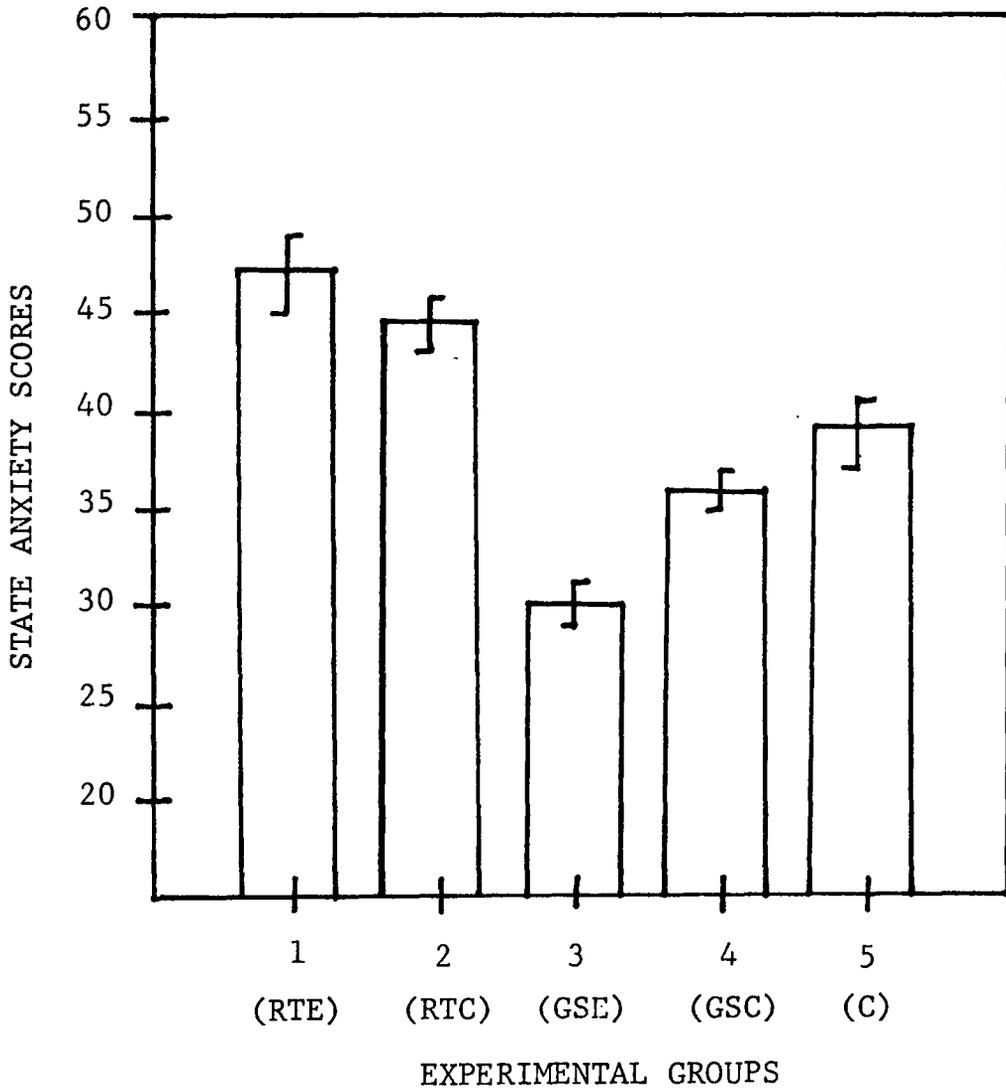


Figure 4. Comparison of Post-Test State Anxiety Scores for Groups RTE, RTC, GSE, GSC, and C Showing the Mean (\bar{X}) Plus and Minus One Standard Error of the Mean ($SE_{\bar{X}}$).

TABLE 5

SUMMARY OF ONE-WAY ANOVA ON POST-TEST SCORES
FOR THE STAI (STATE)

Source	SS	df	MS	F
Between	2349.20	4	587.30	7.09*
Within	5217.67	63	82.82	

Total	7566.87	67		

*
p < .05

differences ($p < .05$) existed between the RTE and GSE groups and between the RTC and GSE groups. In addition, the comparison between the RTE group and the GSC group was nearly significant. In each of these comparisons, however, the mean "state" anxiety score for the RTE group was significantly higher than the mean "state" anxiety score of the group with which it was compared. The RTE group was utilized to determine possible reductions in "state" anxiety to activities specific to the "Rat" training program. It has been demonstrated that no such reduction took place. Thus, the results, taken together, suggest that participation in the "Rat" training program failed to reduce "state" anxiety in regard to activities specific to the program.

Reduction in "State" Anxiety in
Regard to a Stressful Military
Activity (Exposure to a Gas Chamber)

As demonstrated by Figure 3, a reduction in the mean "state" anxiety of the GSE and C groups occurred on the post-test of the STAI. No such reduction took place with the RTE group, and the reductions noted for the GSE and C groups were not statistically significant. Examination of Figure 3 also shows that only small mean differences existed between the groups on the pre-test and that those differences were increased on the post-test. The increases, however, did not achieve statistical significance.

Table 3 shows that statistically significant F values were obtained for both Tests and Groups in the two-way

analysis of variance, but that the F value for the Groups x Tests interaction failed significance. The significant main effect of Tests appears to have been created by the lack of a demonstrated reduction in "state" anxiety for the RTE group and the reductions demonstrated by the GSE and C groups.

Figure 4 graphically demonstrates the differences in the post-test mean "state" anxiety scores for the five groups. As previously indicated, substantial differences among the groups are evident. The results of the one-way analysis of variance on the post-test "state" anxiety scores are shown in Table 5. The obtained F value indicated that a statistically significant difference existed among the post-test mean scores of the five groups so the Scheffé test was utilized to determine which group differences were significant. Significant F values were obtained as a result of the Scheffé comparisons made between the RTE and GSE groups and between the RTC and GSE groups. In addition, the comparison between the RTE group and the GSC group just failed significance.

The purpose of the RTC and GSC groups was to control for sensitization effects of the pre-test on post-test scores for the RTE group and the GSE group, respectively. As no significant F value was found in the comparisons made between the RTE and RTC groups or between the GSE and GSC groups, the data indicated that no such sensitization took place.

The purpose of the GSE group was to determine if participation in the "Rat" training program would reduce "state" anxiety in regard to a military stressor (the gas chamber exercise) which was dissimilar to "Rat" training activities. The "state" anxiety of the GSE group was significantly lower than that of the RTE and RTC groups, but there was no significant difference demonstrated between the "state" anxiety of the GSE group and the C group, and no significant difference between the RTE and RTC groups and the C group. Therefore, the data, taken together, failed to demonstrate that participation in "Rat" training was associated with a reduction in "state" anxiety toward the gas chamber exercise.

"TRAIT" ANXIETY DATA

The RTE, GSE, and C groups were administered a pre-test and post-test of the STAI, in which individual and group mean scores for "trait" anxiety were calculated. The RTC and GSC groups received a post-test only with the STAI. The resulting scores were analyzed in a manner identical to that applied with the TSCS and "state" anxiety scores.

The pre-test and post-test mean "trait" anxiety scores for the RTE, GSE, and C groups are presented in Figure 5. It can be seen that only small mean changes in "trait" anxiety took place. The results of the Groups x Tests analysis of variance with repeated measures on the

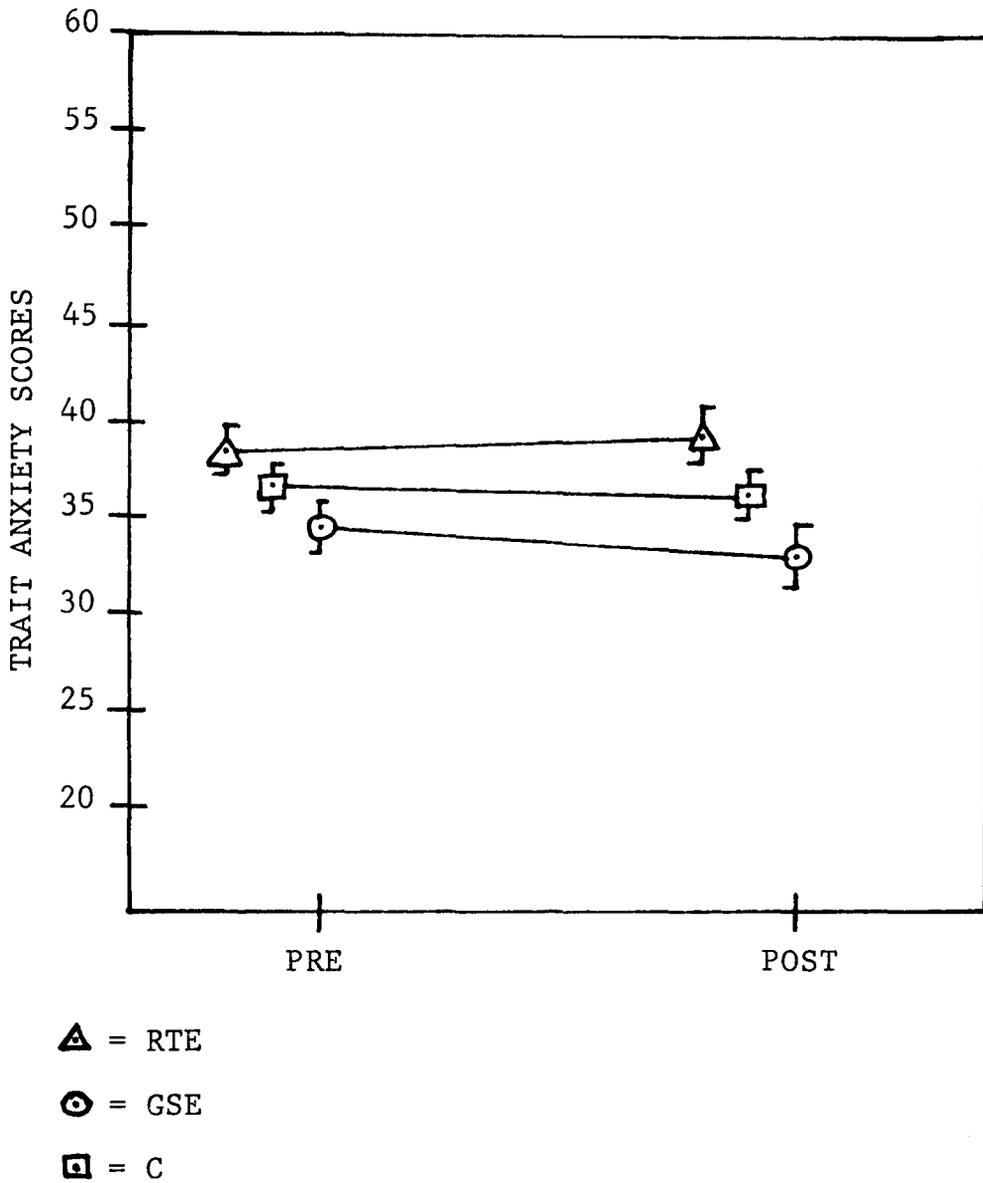


Figure 5. Comparison of Pre-Test and Post-Test Trait Anxiety Scores, for Groups RTE, GSE and C, Showing the Mean (\bar{X}) Plus and Minus One Standard Error of the Mean ($SE_{\bar{X}}$).

latter factor are shown in Table 6. The obtained F values indicated an absence of statistical significance for both main and interaction effects.

The post-test mean "trait" anxiety scores for all five groups are presented in Figure 6. While only small differences existed among most of the groups, a somewhat larger difference was demonstrated between the RTC group and the GSE group. The results of the one-way analysis of variance on post-test "trait" anxiety scores are shown in Table 7. The obtained F value indicated a significant difference, $F(4,63)=2.70$, $p < .05$, so the Scheffé test was utilized to locate the specific cell mean differences. Though a significant F value was found through the analysis of variance, no significant differences could be found between any of the post-test group mean scores with the Scheffé test. The comparison between the RTC and GSE groups did, however, approach significance.

As no statistically significant F values were found with the analysis of the pre-test and post-test mean scores of the RTE, GSE, and C groups, and an analysis of the post-test mean scores for all groups produced a significant F value that was not replicated with the Scheffé test, the data suggest that participation in "Rat" training was not associated with a reduction in the "Trait" anxiety of participants.

TABLE 6

SUMMARY OF GROUPS X TESTS ANOVA WITH REPEATED MEASURES
ON THE LATTER FACTOR FOR THE STAI (TRAIT)

Source	SS	df	MS	F
Model	3905.22	41	95.25	6.83
Error	502.27	36	13.95	
Total	4407.49			

Group	262.27	2	131.13	1.30
Subj (Group)	3619.22	36	100.53	
Tests	6.21	1	6.21	0.44
Group x Tests	17.5	2	8.76	0.63

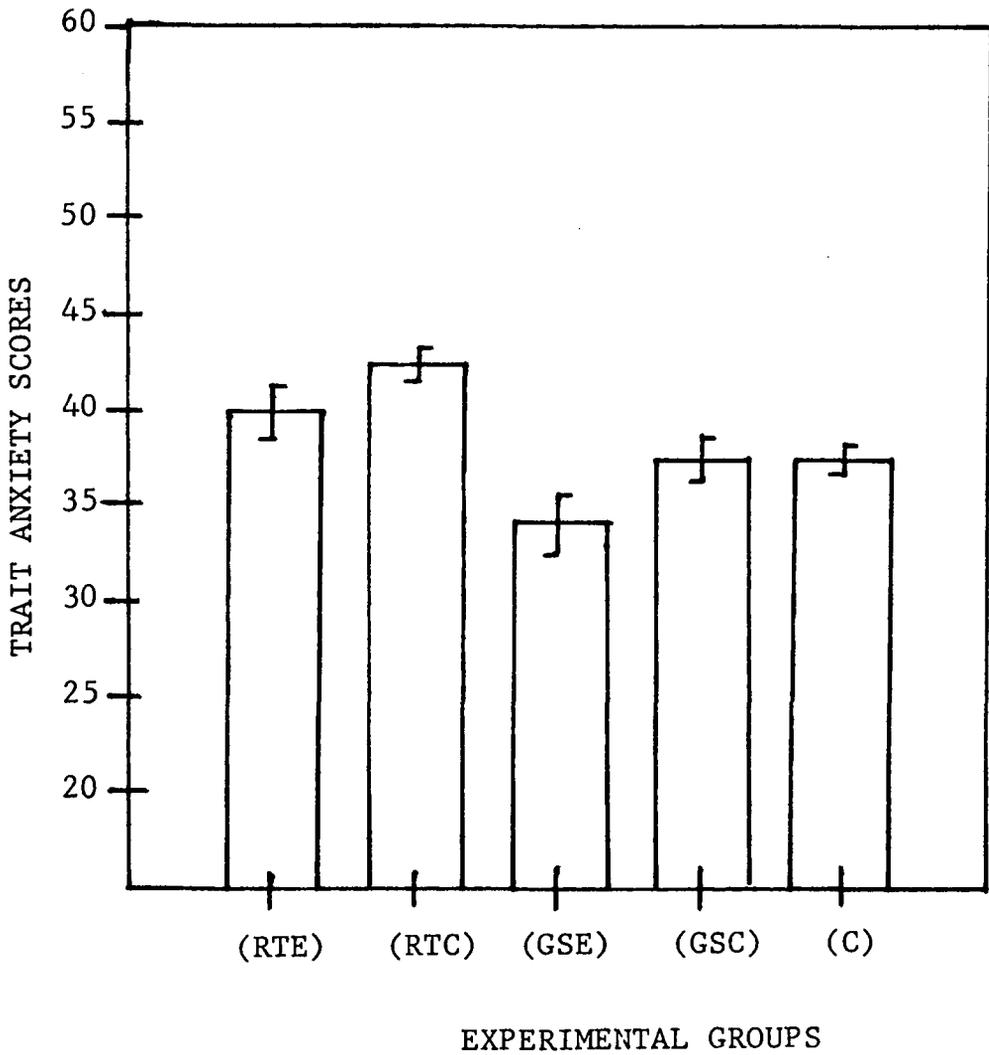


Figure 6. Comparison of Post-Test Trait Anxiety Scores for the RTE, RTC, GSE, GSC and C Groups, Showing the Mean (\bar{X}) Plus and Minus One Standard Error of the Mean ($SE_{\bar{X}}$).

TABLE 7

SUMMARY OF ONE-WAY ANOVA ON POST-TEST SCORES
FOR THE STAI (TRAIT)

Source	SS	df	MS	F
Between	558.47	4	139.62	2.70*
Within	3262.46	63	51.78	

Total	3820.94	67		

*
p < .05

DISCUSSION

The Virginia Military Institute's "Rat" training program was modeled after the activities and philosophy of the Outward Bound organization, and significant positive alterations in self-concept have been demonstrated as a result of participation in Outward Bound and other wilderness--survival experiences (Wetmore, 1972; Koepke, 1974; Clifford and Clifford, 1967; Stimpson and Pedersen, 1970). However, similar alterations in self-concept did not occur in the present study as a result of participation in the "Rat" training program.

There are differences between the Outward Bound and "Rat" training programs which may account for the conflicting results. One difference between the two programs is that while Outward Bound is conducted in a civilian atmosphere, the "Rat" training program is run in a more formal military fashion. Koepke (1974) has indicated that within the Outward Bound course, there are no standard requirements for achievement, and that all individual accomplishments, no matter how insignificant they may seem, are acknowledged and receive positive reinforcement. Koepke (1974:84), also stated that "the interpersonal relationships that develop through this mutual support are an important aspect of the course." While this same type of relationship has been attempted during the "Rat" training program, it may not parallel that of the

Outward Bound programs. Because of the military atmosphere, the relationships between cadet instructors and "Rats" are not always as relaxed and supportive as might be desired. The Virginia Military Institute operates on a "Class" system, with freshman or "Rats" being on the lowest end of the hierarchy, and it is difficult to prevent this system and the military atmosphere from permeating the participant-instructor interactions taking place within the "Rat" training program.

Another difference that may have exerted its influence is that while individuals voluntarily elect to participate in Outward Bound programs, participation in "Rat" training is mandatory. Outward Bound participants may anticipate and be actively seeking some positive influence or change in their personal lives, whereas cadets are doing what is required or expected of them.

Koepke (1974), has pointed out that cooperative living in the wilderness is a new experience for many Outward Bound participants, and that this close interaction in the preparation and management of every day living in a wilderness environment is a very influential aspect of the Outward Bound program. Here too, there is a difference between the two programs that may be exerting its influence on self-concept scores. While Outward Bound participants are living together in the out-of-doors 24 hours a day over a three week period, "Rat" training is conducted only twice per week for two hours a session. This limits personal exposures in the demanding

environment, as well as the amount of personal interaction directly attributable to the "Rat" training experience.

There are some other more tangible differences between the two programs that could have contributed to the present results. Two major activities of Outward Bound programs are the patrol expeditions and the "solo" experience (Pickard, 1968). The patrol expedition involves a three or four day trek through the wilderness, requiring individuals to work together and rely upon each other as they confront the challenges of the environment. The "solo" is an exercise in which individuals are left alone in the wilderness with a minimum of equipment and no food, and are expected to "live off the land" for three days. These types of experiences allow for intense interaction between individuals and also provide opportunity for much self-examination and introspection. The possible benefits that intense experiences like these may have for the participants' self-concepts are not available in the "Rat" training program, because these experiences are not included in the schedule of activities.

Participation in the "Rat" training program did not result in any significant changes in the "state" anxiety of participants toward activities specific to the program. Significant reductions in "state" anxiety have been reported by Koepke (1974) as a result of participation in an Outward Bound program, and significant reductions in anxiety were also reported by Thorstenson, Heaps and Snow (1975), as a

result of a 29 day wilderness survival experience. In both studies, however, no control group was utilized, and because the post-tests were administered after completion of the two experiences, no threat of further exposure to activities within the programs existed. Generalizations concerning these reductions in anxiety are tenuous because they may have occurred randomly as a result of the passage of time or because the same stress stimulus present at the pre-test was not present at the post-test. The present experiment, however, did utilize a control group and the same stress stimulus (exposure to activities within the "Rat" training program) existed at the time of the post-test as did at the time of the pre-test. The resulting data did not support the conclusion that exposure to activities such as those contained in the "Rat" training program necessarily reduces a participants' "state" anxiety toward those activities.

Other studies (Freeman and Kendrick, 1960; Grossberg, 1965; Walton and Mather, 1963) have indicated that anxiety towards certain objects or activities can be reduced by exposure to the anxiety-producing situation. However, exposure to the anxiety-producing situation was done on a gradual basis in these studies, and several exposures (in a hierarchical progression) were necessary before the desired reduction in anxiety was achieved. The "Rat" training program did not utilize this system of exposure as it would be time consuming and not a feasible practice due to the time limitations already inherent in the program.

Participation in the "Rat" training program did not produce a significant reduction in the "state" anxiety of participants toward a stressful military activity (exposure to a gas chamber) which was dissimilar to "Rat" training activities. As "state" anxiety toward "Rat" training activities was not significantly altered by participation in the program, a similar result in regard to an activity not specific to the program would be expected.

There was no significant reduction in "trait" anxiety as a result of participation in the "Rat" training program. Since Spielberger (1970:3), has defined "trait" anxiety as ". . . relatively stable individual differences in anxiety proneness, that is to differences between people in the tendency to respond to situations perceived as threatening with elevations in 'state' anxiety," this result is not unexpected. "Trait" anxiety is a measure of an individual's potential for incurring elevations in "state" anxiety under conditions of stress, and specific circumstances should have little effect on "trait" anxiety scores.

The implications of these findings are particularly relevant to programs of physical education modeled after Outward Bound or similar experiences, but modified for administration in a collegiate setting. Research evidence (Clifford and Clifford, 1967; Koepke, 1974; Wetmore, 1972) has suggested that programs such as Outward Bound have the ability to positively influence the self-concepts of parti-

participants, and reduce their anxiety. If programs of this type can be developed and administered within the collegiate setting, it would enable physical educators and students to reap the reported benefits of wilderness survival experiences without taking time away from their normal study schedules.

The findings of the present study, however, indicated that participation in such a modified program (V.M.I. "Rat" training) did not significantly alter the anxiety or the self-concepts of participants. This implies that programs modified for administration in a collegiate setting may not be as effective as Outward Bound and other wilderness experiences in regard to the positive alteration of the parameters in question. However, since certain activities contained in the Outward Bound program were not included in the "Rat" training program, further modification of "Rat" training to include these activities (patrol expeditions and the "solo" experience) may enhance its ability to affect these personality constructs.

Since the variables examined in this study were not significantly altered as a result of participation in the "Rat" training program, another implication is that the program has little potential in this regard, and should be re-examined for its possible contribution in other areas. It has been purported that the program contributes to the physical fitness of participants and that it provides them with a learning experience in regard to activities that may confront

them in the military. The effectiveness of the program in these areas has not been examined.

An additional implication is that the "Rat" training program is not participated in long enough to produce positive results. Regular Outward Bound programs are conducted over a three week period and participation is continuous, 24 hours a day. The "Rat" training program was conducted only twice per week in two hour sessions for 11 weeks.

The "Rat" training program did not significantly reduce the "state" anxiety of participants toward a military gas chamber exercise. The implication is that exposure to one anxiety-producing situation ("Rat" training) will not necessarily reduce an individual's anxiety to another unrelated situation.

It is apparent that care must be taken in espousing the benefits of the V.M.I. "Rat" training program, since it has failed to demonstrate its effectiveness in the reduction of anxiety and the improvement of self-concept. However, continued modification and evaluation of the program may improve these results.

The implications of this study may have relevance extending beyond the evaluation of the V.M.I. "Rat" training program. Much of the support for physical education programs is based upon their purported ability to positively influence the behavior, self-perceptions and personalities of participants (Frost, 1971; Gerstung, 1974; Sprandel, 1974; Van

Slooten, 1974; Kinder, 1973; Kniker, 1974). Since personality theorists such as Rogers (1951), Snygg and Combs (1959), and Rosenberg (1965) have indicated the importance of both self-concept and anxiety as determinants of behavior, it would be expected that physical education programs exert some positive influence on these variables. If it cannot be shown that physical education programs are effective in this regard, their support is weakened, and physical educators will have to expound other attributes that are supported by research evidence.

The possible contributions of physical education programs to the physical and psychological development of participants warrants continued examination. Additional research into the effects of participation in physically and psychologically stressful situations may determine the content and impact of physical education in the future.

Chapter 5

SUMMARY AND CONCLUSIONS

PURPOSE

The purpose of this study was to determine if participation in the V.M.I. "Rat" training program would (1) positively alter the self-concepts of participants over those of non-participants, (2) reduce the "state" anxiety of participants in regard to activities specific to the program, (3) reduce the "state" anxiety of participants in regard to a stressful military activity (exposure to a gas chamber) which is dissimilar to the training program activities, or (4) cause a reduction in the "trait" anxiety of participants.

METHODS

Sample

The sample included male first year military college students (N=75) attending the Virginia Military Institute. The subjects were randomly selected from the freshman class, but no athletes in season, scholarship athletes, or individuals receiving ROTC scholarships were included in the sample. The subjects selected were then randomly assigned to one of five groups of 15 subjects per group. Seven subjects were removed from the study for various reasons. Four subjects left school prior to completing the "Rat" training program

and two were erroneously permitted to become members of varsity athletic teams mid-way through "Rat" training. A final subject was removed from the study because he was found to be medically unqualified to participate in the gas chamber exercise. This left the total number of subjects in the study at 68.

"Rat" Training Program

The "Rat" training program included combative activities, pugil stick competition, a "slide for life," rappelling, confidence obstacles, group problems, a river crossing, physical conditioning, endurance running, a mountain march, and a military stamina course. "Rat" training was conducted twice weekly in two hour sessions, for 11 weeks.

Design and Test Instruments

A Solomon counterbalanced design (Ary, Jacobs, Razavieh, 1972) was utilized in this study. Three groups (RTE, GSE, C) received pre-tests and post-tests on the instruments and two groups (RTC, GSC) received only post-tests, serving as controls for the possible sensitization effects of the pre-tests on the RTE and GSE groups.

The Tennessee Self-Concept Scale (TSCS) was used to measure the expressed self-perceptions of the sample and was administered to the RTE, GSE and C groups prior to and after eleven weeks of the "Rat" training program. The scale was administered to the GSC group after 11 weeks participation

in the "Rat" training program, and though a pre-test and post-test were administered to the C group, this group did not participate in the "Rat" training program.

The State-Trait Anxiety Inventory (STAI) was utilized to measure the two separate anxiety concepts of "state" anxiety and "trait" anxiety and was administered to the sample in the same manner as was the Tennessee Self-Concept Scale. In the case of the GSE group the STAI was administered prior to their exposure to a gas chamber exercise, both before participation in the "Rat" training program, and following 11 weeks of participation. The RTC group was administered the STAI after 11 weeks of "Rat" training, and just prior to their exposure to a gas chamber exercise. The control group was administered a pre-test and post-test of the instrument, but did not participate in "Rat" training or in the gas chamber exercise.

Statistical Treatment of Data

Data analysis included a Groups x Tests analysis of variance with repeated measures across the latter factor (Groups RTE, GSE, and C) and a one-way analysis of variance on the post-test scores (Groups RTE, RTC, GSE, GSC, and C). The significance of differences between post-test group mean scores on the two instruments as well as any sensitization effects of the pre-test on the post-test data were determined, and the effects of the various treatments were examined and

comparisons made. Where statistically significant differences were found through ANOVA, the Scheffé test was used to locate specific cell mean differences.

FINDINGS

Analysis of the mean pre-test and post-test self-concept scores for the RTE, GSE and C groups revealed no statistically significant main or interaction effects. Analysis of the post-test group mean self-concept scores for all five groups also failed significance.

The analysis of the mean pre-test and post-test "state" anxiety scores for the RTE, GSE and C groups yielded significant main effects for both groups and tests. However, the Groups x Tests interaction failed significance. The Scheffé test, utilized to determine which group mean differences were responsible for the significant main effect of groups, revealed a significant difference between the RTE and GSE groups.

The one-way analysis of variance on post-test "state" anxiety scores for all five groups also produced a significant F value. The Scheffé test, utilized to locate the specific group mean differences, revealed significant differences between the RTE and GSE groups and between the RTC and GSE groups.

While the analysis of pre-test and post-test "trait" anxiety scores for the RTE, GSE and C groups revealed a lack

of statistical significance for both main and interaction effects, the analysis of post-test group mean "trait" anxiety scores for all five groups was statistically significant. However, post hoc procedures failed to detect the source of the differences.

CONCLUSIONS

Participation in the V.M.I. "Rat" training program did not significantly alter the personality variables examined (self-concept and "state" and "trait" anxiety).

RECOMMENDATIONS FOR FURTHER RESEARCH

Given the results of the present investigation, the following suggestions for future research are recommended:

1. An investigation to examine the influence of a physical education program containing the activities of the "Rat" training program, on the self-concepts and "state" and "trait" anxiety of participants at non-military colleges or universities.

2. A study to determine if a modification of the "Rat" training program to include the patrol expeditions and the "solo" experience that are a part of the Outward Bound programs, has a positive influence on the self-concepts of participants.

3. A study to determine if "Rat" training is effective in reducing the "state" anxiety of participants

toward any specific single activities contained in the program (i.e., rappelling or pugil stick competition).

4. An experiment to examine the influence of a "Rat" training program on the self-concepts and "state" and "trait" anxiety of high school students, in order to determine the effectiveness of such a program at the secondary school level.

5. A study to compare the effects of the "Rat" training experience on the self-concepts of subjects who actively seek participation with those subjects who participate merely because it is required.

6. A comparison of the effects of the "Rat" training experience on subjects classified initially as "low" self-concept subjects, and those classified as "normal" or "high" self-concept subjects, in order to determine if an individual's initial level of self-concept influences his sensitivity to change.

7. A comparison between individuals classified as being "low" anxiety subjects and those classified as "high" anxiety subjects, in order to determine if initial anxiety levels influence sensitivity to change.

8. A study to determine the effectiveness of a three week "Rat" training program, conducted outside the college environment, in which participants are involved in the training on a 24 hour basis.

9. An investigation to determine the effectiveness of the "Rat" training program in enhancing the physical fitness of participants. This is a stated purpose of the program that has not yet been evaluated.

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APPENDIX A
TENNESSEE SELF-CONCEPT SCALE

(TENNESSEE SELF-CONCEPT SCALE)

INSTRUCTIONS

On the top line of the separate answer sheet, fill in your name and the other information except for the time information in the last three boxes. You will fill these boxes in later. Write only on the answer sheet. Do not put any marks in this booklet.

The statements in this booklet are to help you describe yourself as you see yourself. Please respond to them as if you were describing yourself to yourself. Do not omit any item! Read each statement carefully; then select one of the five responses listed below. On your answer sheet, put a circle around the response you chose. If you want to change an answer after you have circled it, do not erase it but put an X mark through the response and then circle the response you want.

When you are ready to start, find the box on your answer sheet marked time started and record the time. When you are finished, record the time finished in the box on your answer sheet marked time finished.

As you start, be sure that your answer sheet and this booklet are lined up evenly so that the item numbers match each other.

Remember, put a circle around the response number you have chosen for each statement.

Responses-	Completely false	Mostly false	Partly false and partly true	Mostly true	Completely true
	1	2	3	4	5

You will find these response numbers repeated at the bottom of each page to help you remember them.

	Page 1	Item No.
1. I have a healthy body.....		1
3. I am an attractive person.....		3
5. I consider myself a sloppy person.....		5
19. I am a decent sort of person.....		19
21. I am an honest person.....		21
23. I am a bad person.....		23
37. I am a cheerful person.....		37
39. I am a calm and easy going person.....		39
41. I am a nobody.....		41
55. I have a family that would always help me in any kind of trouble.....		55
57. I am a member of a happy family.....		57
59. My friends have no confidence in me.....		59
73. I am a friendly person.....		73
75. I am popular with men.....		75
77. I am not interested in what other people do.....		77
91. I do not always tell the truth.....		91
93. I get angry sometimes.....		93

Responses-	Completely false	Mostly false	Partly false and partly true	Mostly true	Completely true
	1	2	3	4	5

- 2. I like to look nice and neat all the time..... ██████████
- 4. I am full of aches and pains..... ██████████
- 6. I am a sick person..... ██████████
- 20. I am a religious person..... ██████████
- 22. I am a moral failure..... ██████████
- 24. I am a morally weak person..... ██████████
- 38. I have a lot of self-control..... ██████████
- 40. I am a hateful person..... ██████████
- 42. I am losing my mind..... ██████████
- 56. I am an important person to my friends and family..... ██████████
- 58. I am not loved by my family..... ██████████
- 60. I feel that my family doesn't trust me..... ██████████
- 74. I am popular with women..... ██████████
- 76. I am mad at the whole world..... ██████████
- 78. I am hard to be friendly with..... ██████████
- 92. Once in a while I think of things too bad to talk about..... ██████████
- 94. Sometimes, when I am not feeling well, I am cross..... ██████████

Responses-	Completely false	Mostly false	Partly false and partly true	Mostly true	Completely true
	1	2	3	4	5

	Page 3	Item No.
7. I am neither too fat nor too thin.....		7
9. I like my looks just the way they are.....		9
11. I would like to change some parts of my body.....		11
25. I am satisfied with my moral behavior.....		25
27. I am satisfied with my relationship to God.....		27
29. I ought to go to church more.....		29
43. I am satisfied to be just what I am.....		43
45. I am just as nice as I should be.....		45
47. I despise myself.....		47
61. I am satisfied with my family relationships.....		61
63. I understand my family as well as I should.....		63
65. I should trust my family more.....		65
79. I am as sociable as I want to be.....		79
81. I try to please others, but I don't overdo it.....		81
83. I am no good at all from a social standpoint.....		83
95. I do not like everyone I know.....		95
97. Once in a while, I laugh at a dirty joke.....		97

Responses-	Completely false	Mostly false	Partly false and partly true	Mostly true	Completely true
	1	2	3	4	5

- 8. I am neither too tall nor too short.....
- 10. I don't feel as well as I should.....
- 12. I should have more sex appeal.....
- 26. I am as religious as I want to be.....
- 28. I wish I could be more trustworthy.....
- 30. I shouldn't tell so many lies.....
- 44. I am as smart as I want to be.....
- 46. I am not the person I would like to be.....
- 48. I wish I didn't give up as easily as I do.....
- 62. I treat my parents as well as I should (Use past tense if parents are not living).....
- 64. I am too sensitive to things my family say.....
- 66. I should love my family more.....
- 80. I am satisfied with the way I treat other people.....
- 82. I should be more polite to others.....
- 84. I ought to get along better with other people.....
- 96. I gossip a little at times.....
- 98. At times I feel like swearing.....

Responses -	Completely false	Mostly false	Partly false and partly true	Mostly true	Completely true
	1	2	3	4	5

	Page 5	Item No.
13. I take good care of myself physically.....		13
15. I try to be careful about my appearance.....		15
17. I often act like I am "all thumbs".....		17
31. I am true to my religion in my everyday life.....		31
33. I try to change when I know I'm doing things that are wrong.....		33
35. I sometimes do very bad things.....		35
49. I can always take care of myself in any situation.....		49
51. I take the blame for things without getting mad.....		51
53. I do things without thinking about them first.....		53
67. I try to play fair with my friends and family.....		67
69. I take a real interest in my family.....		69
71. I give in to my parents. (Use past tense if parents are not living).....		71
85. I try to understand the other fellow's point of view.....		85
87. I get along well with other people.....		87
89. I do not forgive others easily.....		89
99. I would rather win than lose in a game.....		99

Responses -	Completely false	Mostly false	Partly false and partly true	Mostly true	Completely true
	1	2	3	4	5

- 14. I feel good most of the time
- 16. I do poorly in sports and games
- 18. I am a poor sleeper
- 32. I do what is right most of the time
- 34. I sometimes use unfair means to get ahead
- 36. I have trouble doing the things that are right
- 50. I solve my problems quite easily
- 52. I change my mind a lot
- 54. I try to run away from my problems
- 68. I do my share of work at home
- 70. I quarrel with my family
- 72. I do not act like my family thinks I should
- 86. I see good points in all the people I meet
- 88. I do not feel at ease with other people
- 90. I find it hard to talk with strangers
- 100. Once in a while I put off until tomorrow what I ought to do today

Responses-	Completely false	Mostly false	Partly false and partly true	Mostly true	Completely true
	1	2	3	4	5

APPENDIX B
STATE-TRAIT ANXIETY INVENTORY

SELF-EVALUATION QUESTIONNAIRE

Developed by C. D. Spielberger, R. L. Gorsuch and R. Lushene

STAI FORM X-1

NAME _____ DATE _____

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then blacken in the appropriate circle to the right of the statement to indicate how you *feel* right now, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1. I feel calm	①	②	③	④
2. I feel secure	①	②	③	④
3. I am tense	①	②	③	④
4. I am regretful	①	②	③	④
5. I feel at ease	①	②	③	④
6. I feel upset	①	②	③	④
7. I am presently worrying over possible misfortunes	①	②	③	④
8. I feel rested	①	②	③	④
9. I feel anxious	①	②	③	④
10. I feel comfortable	①	②	③	④
11. I feel self-confident	①	②	③	④
12. I feel nervous	①	②	③	④
13. I am jittery	①	②	③	④
14. I feel "high strung"	①	②	③	④
15. I am relaxed	①	②	③	④
16. I feel content	①	②	③	④
17. I am worried	①	②	③	④
18. I feel over-excited and "rattled"	①	②	③	④
19. I feel joyful	①	②	③	④
20. I feel pleasant	①	②	③	④

SELF-EVALUATION QUESTIONNAIRE
STAI FORM X-2

NAME _____ DATE _____

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then blacken in the appropriate circle to the right of the statement to indicate how you *generally* feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

	ALMOST NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS
21. I feel pleasant	①	②	③	④
22. I tire quickly	①	②	③	④
23. I feel like crying	①	②	③	④
24. I wish I could be as happy as others seem to be	①	②	③	④
25. I am losing out on things because I can't make up my mind soon enough	①	②	③	④
26. I feel rested	①	②	③	④
27. I am "calm, cool, and collected"	①	②	③	④
28. I feel that difficulties are piling up so that I cannot overcome them	①	②	③	④
29. I worry too much over something that really doesn't matter	①	②	③	④
30. I am happy	①	②	③	④
31. I am inclined to take things hard	①	②	③	④
32. I lack self-confidence	①	②	③	④
33. I feel secure	①	②	③	④
34. I try to avoid facing a crisis or difficulty	①	②	③	④
35. I feel blue	①	②	③	④
36. I am content	①	②	③	④
37. Some unimportant thought runs through my mind and bothers me	①	②	③	④
38. I take disappointments so keenly that I can't put them out of my mind	①	②	③	④
39. I am a steady person	①	②	③	④
40. I get in a state of tension or turmoil as I think over my recent concerns and interests	①	②	③	④

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EFFECT OF A PHYSICAL TRAINING PROGRAM INVOLVING PSYCHO-
PHYSICAL STRESS UPON THE ANXIETY AND SELF-CONCEPTS
OF MALE MILITARY COLLEGE STUDENTS

by

Gordon O. Calkins, Jr.

(ABSTRACT)

The primary purpose of this study was to determine to what extent the "Rat" (freshman) training program at the Virginia Military Institute alters the anxiety and self-concepts of participants. "Rat" training consists of various activities involving physical and psychological stress, that have been modeled after activities contained in Outward Bound and various military programs. Sixty-eight male first-year cadets at the Virginia Military Institute were randomly assigned to one of five experimental groups.

The "Rat" Training Experimental Group (RTE) (N=13) and the Gas Stressor Experimental Group (GSE) (N=12) were administered the Tennessee Self-Concept Scale (TSCS) prior to and after participation in the "Rat" training program, while the primary Control Group (C) (N=14) received only the pre-test and post-test without participating in the "Rat" training program. The RTE group was also administered the State-Trait Anxiety Inventory (STAI) immediately prior to its initial participation in "Rat" training and again following 11 weeks of participation and just prior to a session of "Rat" training activities. The GSE group was

administered the STAI prior to participation in a military gas chamber exercise. A post-test of the STAI was administered after 11 weeks participation in "Rat" training and immediately prior to what appeared to be a second exposure to the gas chamber. The C group also received a pre-test and post-test of the STAI, but did not participate in the "Rat" training program. The "Rat" Training Control Group (RTC) (N=14) participated in the "Rat" training program, but received only post-tests of the TSCS and the STAI. The Gas Stressor Control Group (GSC) (N=15) was not pre-tested, but participated in "Rat" training and was administered a post-test of the STAI immediately prior to participation in a gas chamber exercise identical to that participated in by the GSE group. A post-test of the TSCS was administered to the GSC group following participation in the program.

The "total positive" score from the TSCS and the "state" and "trait" anxiety scores of the RTE, GSE, and C groups were analyzed using a Groups x Tests analysis of variance with repeated measures on the latter factor. In addition, a one-way analysis of variance was performed on the post-test "total positive" TSCS scores and the "state" and "trait" anxiety scores of all five groups (RTE, RTC, GSE, GSC, C). Where significant differences were found through ANOVA, the Scheffé test was utilized to locate the specific cell mean differences.

Comparisons of mean self-concept scores revealed that no significant alterations in self-concept took place as a result of participation in "Rat" training. A reduction in "state" anxiety to the gas chamber exercise did take place, but it was not statistically significant. No such reduction took place with regard to the activities within the "Rat" training program and mean "trait" anxiety scores were not altered significantly as a result of participation in "Rat" training. It was concluded that "Rat" training does not positively alter the personality variables examined.