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THE EFFECTS OF COGNITIVE BEHAVIOR MODIFICATION ON TYPE A BEHAVIOR IN ACADEMICALLY SUPERIOR SECONDARY SCHOOL STUDENTS

The College of William and Mary in Virginia ED.D. 1983

THE EFFECTS OF COGNITIVE BEHAVIOR MODIFICATION ON TYPE A BEHAVIOR IN ACADEMICALLY SUPERIOR SECONDARY SCHOOL STUDENTS

A Dissertation

Presented to the

Faculty of the School of Education

College of William and Mary In Virginia

In Partial Fulfillment

Of the Requirements for the Degree

Of Doctor of Education

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by

Robert John Grant

May, 1983

APPROVAL SHEET

We the undersigned do certify that we have read this dissertation and that in our individual opinions it is acceptable in both scope and quality as a dissertation for the degree of Doctor of Education.

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DEDICATION

This dissertation is dedicated to my father, George J.Grant, Jr. (1915-1977) who taught me that true excellence can only be achieved by an exercise of genuine humanity.

ACKNOWLEDGEMENTS

Many individuals have proven more instrumental than they realize in the completion of my doctoral studies. It is with deep gratitude that I acknowledge their contributions.

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To my wife Suzanne who graciously allowed me to abandon her to take up residence at William and Mary for a year.

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CHAPTER I.

INTRODUCTION

A. Justification for the study.

Coping with stress is an issue which faces every individual at some point in his/her life. One reads continually about the increased pressures of modern life, and about the rapid pace at which our society forces people to live. While many of these stress reactions are indeed imposed by our environment or by circumstances beyond our control, it is becoming increasingly clear that much stress and anxiety is self-imposed. Indeed, as Lazarus (1966) points out, cognition is the most important factor in the development of stress reaction patterns. Much research has focused on the effects that stress has on the achievement and performance levels of students, workers, managerial personnel and other groups. More important, however, are the physical effects that various stress reactions bring out in individuals. Peptic ulcers, hypertension, and asthma are three common syndromes that have severe stress as a necessary predisposition. However, none of the deleterious physical concomitants of stress is more dangerous or more frightening than that of Coronary Heart Disease (CHD). Surprisingly, only recently has the stress-heart disease link been empirically documented, although as early as 1897 Sir William Osler wrote, "I believe that the high pressure at which men live, and the habit of working the machine to its maximum capacity are responsible for arterial degeneration. (Jenkins, 1975).

Recently cardiologists have identified a specific behavior pattern, known as Type A, that has been causally linked to heart attack in adult males. Further research by Glass (1977) and Matthews (1976) have located this behavior pattern in college students and in younger children. The question then becomes, what can be done to either 1) prevent the development of this type of behavior or 2) modify the behavior by teaching individuals alternate means of dealing with stress?

The issue becomes further compounded by the fact that the behaviors which are most characteristic of Type A persons are strongly encouraged by our society, and, of direct pertinence for this research, are developed, nurtured, and rewarded by our educational system. The high level of achievement striving, coupled with a highly developed sense of time urgency that is indicative of the Type A personality are manifested every day by many of our most superior students. Are we thus encouraging the early development of behaviors which can subsequently become life threatening? Once the Type A pattern is developed in an individual, can it then be modified? Can this modification be accomplished without the loss of academic success? These are three of the questions this research has addressed.

For many years counselors have concentrated their research efforts on developing techniques of counseling and psychotherapy that prove effective in the treatment

of various psychological and personality problems. While this indeed represents a most important avenue of investigation, as Agras (1979) points out, one area of research that warrants primary attention is the study of techniques with preventive value. As will be seen, the Type A behavior pattern was, until recently, viewed as an asset rather than a liability. This study has attempted to determine whether some of the aspects of this behavior pattern can be modified with a view to preventing further entrenchment.

B. Problem Statement

What are the effects of Cognitive Behavior Modification on the Type A Coronary Prone behavior pattern in academically superior secondary school students?

C. Theoretical Rationale.

Modern behavioral therapy has focused much of its attention on the reduction of stress and anxiety reactions in individuals. Wolpe's text, Psychotherapy By Reciprocal Inhibition (1958), provides the basic framework for the application of the principles of learning to the reduction of anxiety. According to this approach, an underlying conditioned stimulus serves to motivate overt behavior, the goal of which is to avoid or eliminate the anxiety producing event in the environment. Hypothesizing that anxiety is incompatible with a state of deep relaxation, Wolpe developed the technique known as systematic desensitization. Essentially this process involves the gradual presentation of the anxiety producing stimulus after a state of deep relaxation has been induced in the client. Through a step by step process, the stimulus is "deconditioned" and no longer produces the overt avoidance or fear behaviors that were once associated with it. Indeed, the internal manifestations of the anxiety reaction are no longer present. Although Wolpe himself places little importance on the cognitive processes of the individual (Wolpe, 1976), several of his followers have extended his theories to encompass a much broader spectrum of human behavior than mere conditioned responses.

Lazarus (1966) notes the very important role that cognition plays both in the production of stress reactions and the development of a repertoire of coping behaviors.

While noting that indeed some behaviors are highly conditioned, and are thus activated automatically, Lazarus maintains that humans are basically evaluative creatures who "appraise" stimuli from the environment before they react." Thus one's response to a stress situation depends on three factors:

1) How strong or threatening one appraises the stressor to be.

2) To what factors one attributes the stressor.

3) To what degree one feels that he/she can cope with the stressor as presented.

However, oftentimes coping patterns that prove to be successful in reducing stress and/or anxiety do become automatic or habitual. This is especially prevalent in individuals whose life style necessitates the constant interaction with many psychological stressors.

A further development of this approach by Meichenbaum (1977) brings us to the principal focus of this investigation. Meichenbaum maintains that the highly habituated patterns of coping with stress that most individuals have developed are inadequate because they a) are usually specific in their application or b) at times have negative effects by limiting the range of the individual's life experiences. The basic question involves whether behavior modification techniques can be successfully used to alter the individual's conscious and unconscious cognitive processes and thus change habituated behavioral patterns and stress reactions. He seeks to eliminate the automatic

nature of responses in order to teach a set of behaviors that is incompatible with the particular behaviors targeted for reduction or elimination. To attain this goal, Meichenbaum developed a procedure entitled "Stress Innoculation Training."

Stress Innoculation Training is fundamentally a skills oriented therapy that utilizes modeling, imagery manipulations,and conditioning to alter both the client's internal dialogue and overt behaviors. Meichenbaum's system of therapy is broken down into five basic elements:

1) Exposing the client to anxiety provoking situations that he/she must face through imagery and role playing.

2) Teaching the client to evaluate his/her anxiety levels.

3) Helping the client to become aware of the anxiety provoking cognitions or self-statements that he/she experiences.

4) Guiding the client in a rational re-evaluation of these self-statements.

5) Monitoring the level of anxiety after re-education. These elements are expanded and developed as the client moves through the three phases of the therapy process.

I.- Education Phase: This period involves teaching the individual about the nature of stress in general, and those stresses that are particularly prevalent in his/her life environment.

a) the client learns that cognition plays a significant role in the problem behavior through didactic pre-

sentations as well as guided self-discovery.

b) the client is trained to systematically monitor the maladaptive behavior and to observe the self-statements that maintain it.

c) the client is taught systematic relaxation.

d) the client develops skill in utilizing the three step method of problem solving: (a) define the problem; (b) anticipate the consequences of the problem; (c) evaluate feedback.

e) the client models, rehearses, and develops positive self-statements and attentional focusing skills.

f) the client is instructed in the use of behavioral techniques of self-monitoring, self-reinforcement.

II.- Rehearsal Phase: This phase is designed to provide the individual with a variety of alternate behaviors, using both direct action and cognitive processes. These alternate behaviors are designed to specifically be incompatible with the previous responses to stress.

a) direct action involves the collecting of information about the stresses the individual faces in life, and new methods of coping.

b) the use of cognitive coping modes centers around the development of new positive self-statements to enable the client to (1) assess the realities of his/her life, (2) control negative thoughts, (3) recognize and utilize arousal, (4) prepare to confront stress situations, and (5) reinforce attempts to use the new skills.

III.-Application Phase; During this period the

individual gradually applies his new skills in controlled situations, both within the therapy setting and in vivo.

The development of new coping skills through this method has proven to be highly successful in assisting individuals to deal with such diverse experiences as anger, phobias, and the tolerance of pain. It has also been successful in the reduction of some of the physiological concomitants of stress producing events/stimuli. It is the interaction of the elements of cognitive processes, stress reactions, and overt behavior patterns that the current investigation has attempted to clarify.

Definition of Terms

Academically superior students: Those students in grades seven or eight who are enrolled in an academically oriented junior high school program of studies and who are honor roll students.

Type A behavior pattern: a pattern of behavior developed over time as a means of coping with stress and characterized by (a) competitive achievement striving and (b) an extreme sense of time urgency.

Type B behavior pattern: the absence of the above noted behaviors.

Coronary Heart Disease: clinical disorder produced by lesions of the coronary arteries, manifested as either (1) angina pectoris or (2) myocardial infarction.

E. General Hypotheses.

The general hypotheses explored in this study include:

(1) What are the effects of Cognitive Behavior Modification (Stress Innoculation Training) on Type A behavior in academically superior secondary school students?

(2) What are the effects of Stress Innoculation Training on the need forAchievement in academically superior secondary students?

(3) What are the effects of Stress Innoculation Training on measured achievement (GPA) in academically superior secondary school students?

F. Sample and data gathering.

The sample for this study (N=90) was randomly selected from a group of secondary school students from three Norfolk, Va. public junior high schools. These junior high school students are enrolled in an academic program of studies in their respective schools, and are honor roll students. All were identified as Type A by the Jenkins Activity Survey.

Post-treatment data was gathered using two group instruments and two individually administered behavioral tasks. The Time Estimate tests and the Writing Speed task are administered individually to the participants and are designed to measure the time urgency component of the Type A personality. The Adjective Check List, which was utilized to measure the need for achievement, and the Timed Arithmetic Task, which measures the achievement striving element of the Type A pattern, are both group administered tests. The group tests were administered during the last session of each counseling group. The control subjects completed the group instruments on the same day as the experimental subjects. The individual tests were administered the following day.

G. Limitations

There are several limitations inherent in the study. First of all the population selected for treatment is entirely comprised of academically superior junior high school students. This group was chosen because, based on previous research and the definition of the Type A behavior pattern, these students are the ones most likely to have developed this pattern of coping with stress at an early age. Thus they appear to be in need of treatment more directly than are other students. However, it is certainly likely that Type A persons can be found in other groups within the secondary school population. The results of this study cannot be legitimately generelized to groups dramatically different from the academically superior.

Secondly, it is impossible to completely control for the effects of the personality and "style" of the counselor delivering the treatment. Although this study has attempted to partially control for this by implementing the treatment in three different schools, with different counselors, using a standard script, it cannot be completely eliminated. However, this closely parallels the situation in the actual delivery of counseling services, since the person of the therapist of necessity enters into any treatment.

Thirdly, although the five session treatment period is common for many methods of group application, it may indeed prove to be too short to have much measurable effect on

behavior patterns that have been long entrenched in the individual's daily life.

PLAN OF PRESENTATION

This research study will be presented in five chapters. The first chapter includes background information about the problem under consideration and the theoretical basis for the treatment modality to be tested. In addition details of the sample group, the procedures used for data gathering and the limitations inherent in the study are presented. Specific terminology is defined and the general hypotheses that guided the research are stated for the reader.

Chapter Two is comprised of a review of research relevant to the various aspects of this project. Chapter Three outlines the procedures used to conduct the experiment, the research design that guided the data gathering and analysis, and the specific null hypotheses tested. Chapter Four presents the results of the experiment according to specific hypotheses. The final chapter consists of a summary of the study, a review of the conclusions that can be drawn from the results, as well as the limitations applicable to the results. Recommendations are offered for the benefit of future researchers in this topic area.

Chapter II

Review of Literature

This review of literature is comprised of several sections. The first section provides a summary of the development of the theory of the Type A Coronary Prone Behavior Pattern and its contributions to coronary heart disease, and outlines the research in this area. The second section reviews the development of Cognitive Behavior Modification, the treatment method tested in this experiment, and reviews the research relevant to its application to the treatment of stress. The third section offers a brief review of the paltry research centering around the high achieving student that comprises the population for this study. The final section discussed information concerning the various measurement instruments utilized in the study.

A. Theory of the Type A Behavior Pattern.

For many years medical scientists and practicing physicians concentrated on studying the relative contributions that high blood cholesterol level, cigarette smoking, high blood pressure and obesity make to the occurrence of coronary heart disease (CHD). Yet the contribution stress makes to this syndrome was long suspected. However, it was not until the process of the Western Collaborative Group Study which began in the 1950's that researchers began to obtain hard evidence for the contribution of behavior to CHD. (Rosenman etal, 1964). In this study approximately 50% of the men examined were classified as Type A according to a standardized interview. In the course of the first ten years of the program, these type A men experienced 2.37 times the rate of new CHD as did the Type B subjects. Even when additional statistical refinements were employed to adjust for the effects of the traditional risk factors (such as smoking, obesity, etc), this group evidenced a new CHD rate of 1.97 times that of the Type B group. While this figure in itself appears rather frightening, many subsequent studies and analyses were conducted before the Type A pattern became accepted as one of the CHD risk factors independent of the "traditional physiological measures." (Friedman, 1974) The vast majority of cardiologists, however, required a demonstrated linkage between the Type A pattern and the physical abnormalities known to cause heart disease. Consequently, Friedman and his

colleagues proceded to conduct an experiment to clarify this linkage. A representative example of their work is the experiment which directly connected the cyclical presence of Type A behavior in Accountants. (i.e. the two months preceeding income tax deadlines) with rising levels of serum cholesterol. Finally, these researchers were able to obtain remarkable accuracy in predicting the development of CHD symptoms and subsequent heart attacks in the Type A men who were previously healthy, thus convincing even the most skeptical empiricist that a serious situation indeed existed.

The final element which makes the entire Type A syndrome of particular concern to behavioral scientists is the increasing evidence that the Type A pattern is in itself a developed or learned means of coping with stress--albeit a deadly means. (Glass, 1977) Yet when one reflects on the description of the Type A individual given below, it sounds enviable. The Type A man or woman:

1) exhibits high achievement striving.

2) possesses a deep sense of the importance of time and deadlines.

3) supresses subjective states (fatigue, etc) that might interfere with task completion.

4) likes to be in control of the situation at hand.

5) thrives on challenge, enjoys the heavy pace they set for themselves, wishes there were more time to accomplish more, etc.

The behaviors described above are indeed not only ones that

we consciously strive to develop in our children, but in and of themselves are not harmful. However, when they are possessed to a very high degree, and when they become an individual's standard response set, intervention seems in order.

Previous research has primarily focused on the existence of the Type A pattern in adults. Whie this is indeed valuable, it seems of principal importance that we begin to thoroughly investigate its existence in younger persons. Gentry mentions (1978) that coronary prone individuals are extremely reluctant to change their long term, fixed behaviors. This is especially true of those who have not experienced cardiac difficulty. Indeed, they see these very behaviors as responsible for much of their success in life. It seems logical then that efforts be directed towards (1) detecting this behavior pattern at an early age, and (2) developing means of successfully modifying the growing Type A pattern and teaching the individual alternate methods of coping with stress.

Jennings and Chol (1981) attempted to clarify the method in which the Type A pattern contributes to the physiological risk factors associated with CHD. Twenty-four male businessmen were classified as either Type A or Type B. All participated in a task measuring reaction time. The individuals were presented with various audio tones, and were told they had to respond within a certain time period to receive credit for the response. Heart rate, blood pressure and breathing rate were measured

throughout the test. An analysis revealed that the average response time and the percent of items correct was about the same for the Type A and Type B groups. However, the Type A men showed a significantly greater increase in blood pressure and vasoconstriction both immediately prior to the beginning of each testing period and during the test itself. Thus the authors conclude that the Type A pattern causes individuals to react to an anticipated stress or challenge with physiological responses known to be harmful to health.

Byrne (1981) notes that for several years scientists have linked various stressful life events with the onset of myocardial infarction. It seemed likely to him that this evidence could somehow be linked to the Type A behavior pattern. The study identified 120 individuals (93 m, 27 f) who had recently survived a heart attack. Each subject was classified as either Type A or Type B using the Jenkins Activity Survey. Data was then collected on significant life events in the twelve months prior to the onset of myocardial infarction. The group of patients identified as Type A scored significantly higher in all areas of stressful life events than the Type B's. In addition Type A's resported these events to be more emotionally stressful than did Type B subjects. The author feels that evidence thus exists to conclude that Type A persons place themselves in positions which increase the likelihood of encountering life-events associated with CHD. Thus the behavior pattern effects not only the individual's job performance, but actually serves

as the pattern in which the Type A person organizes his/her lifestyle.

Yarnold and Grimm (1982) attempted to again demonstrate the degree of time urgency evidenced by Type A individuals, but decided to utilize all female volunteers. Twenty-two subjects were asked to read technical materials aloud and to signal when one minute had passed. Each subject later completed the Jenkins Activity Survey. Results showed that the mean time estimate for Type A's (N=11) was 61.4 seconds, for Type B's 77.2 seconds.

In a related study these same researchers administered four personality inventories, one of which was the JAS, to 112 student volunteers (80 m, 32 f). The time of completion was noted for each subject. Over 65.5% of the fastest subjects were classified as Type A while 64.5% of the slowest were Type B. The authors conclude that A's are not only more impatient and time urgent than their Type B counterparts, but that they also strive to accomplish as much as possible in the shortest possible time period.

As noted above, the initial investigation into the Type A pattern centered around employed males, most often business and professional personnel. Of late, however, much attention has been focused on some of the deleterious effects that the increased female involvement in the work world in general, and the professional and managerial ranks in particular, has had on women's health. Jorgensen and Houston (1981) administered the JAS to 61 student volunteers (29 m, 32 f). All subjects then completed the

Stroop-Color Word Interference Task, a mental arithmetic task, and a shock avoidance task. Pulse rate and blood pressure were monitored during these tasks and during the period immediately following the tasks. While the Type A subjects indeed evidenced significantly higher blood pressure and pulse rates during the various tests, the expected sex difference did not materialize. There was virtually no difference between the male and female Type A's on any of the measures or during any of the tasks. The authors hypothesize that in future years the incidence of "premature" heart attack among working females will increase if some means of preventing or alleviating the Type A pattern is not identified.

In a related study Batlis and Small (1982) administered the Bem Sex Role Inventory and the Behavior Activity Profile (similar to the JAS) to a group of 64 working individuals (37 m, 27 f). Each person was classified as Androgynous, Masculine, Feminine, or Undifferentiated according to the Bem inventory. An analysis of the BAP revealed that the group identified as masculine in sex role orientation were significantly higher on the Type A scale than any other group regardless of biological sex. None of the other groups differed from any other. Thus the contribution of the Type A pattern to CHD is related to the sex role of the individual; not the biological gender. The authors suggest that some of the other factors that contribute to CHD be investigated for the possible effects of the sex role orientation.

In two studies which return to the notion of occupational stress Ivancevich et.al (1982) attempted to link the Type A pattern to physical well being. In the first investigation 339 managers completed a personal stress survey including the JAS. Various physical measures, including serum cholesterol, blood pressure and percent body fat were taken during a routine physical examination several weeks later. As expected Type A managers reported more stress and a heavier day to day workload than did the Type B subjects. Surprisingly, however, the largest percentage of Type A persons was found among middle level managers rather than among higher or lower ranked employees. While this could be due to the pressures these individuals receive from both superiors and inferiors, no evidence supported this conclusion.

The second study by these researchers began with the administration of a stress questionnaire and the standard Type A interview to 57 female nurses. Various physical measures including serum cholesterol and blood pressure were taken on several successive days. The Type A group reported significantly higher levels of stress due to work overload (for parallel positions), time pressure and role conflicts than did the Type B's. In addition the Type A nurses evidenced consistently higher blood pressure and serum cholesterol levels.

French and Caplan (1972) conducted a series of studies designed to link occupational stress with heart disease. In one study of 104 university professors, those

who reported higher levels of work overload and deadline pressure evidenced significantly higher levels of cholesterol than those who did not report such feelings. In a related earlier study, Miles (1954) found that while 50% of all heart disease patients report long working hours, frequent work deadlines and few periods of rest prior to the onset of their disease, only 12% of the controls (non cardiac) reported such circumstances. These and many other similar studies lead one to easily accept the link of stress with CHD. However, it was not until Friedman et al (1975) successfully measured significantly higher levels of blood pressure, cholesterol and heart rate in Type A's resulting from induced stress that the connection was empirically validated. Type A individuals respond to stress by evidencing high levels of specific, overt Type A behaviors and increased levels of known physical cardiac risk elements. Thus the stress either activates or increases the Type A behaviors which in turn seem to elevate the physical measures. However, it must be remembered that the Type A individual characteristically responds in this manner and thus is subjecting him/herself to high levels of detrimental physical conditions almost constantly. Future research needs to focus on whether the development of alternate means of coping with stress can successfully reduce the Type A pattern and concomitant physical measures. This project represents an attempt to address this issue by measuring the effectiveness of Stress Innoculation Training on the Type A pattern.

B. Cognitive Behavior Modification

For many years the field of counseling and psychotherapy known today as behaviorism maintained its exclusive application to the modification of overt behaviors or the circumstances surrounding overt behaviors. However, some ten years after its general acceptance as a viable treatment modality, practitioners began to observe that other factors seemed to be operating besides environmental stimuli, namely the covert operants or cognitions that are subject to the same laws of learning as are overt behaviors. (Homme, 1965). Through exhaustive research studies involving anxiety-felief conditioning, systematic desensitization, modeling, and mental rehersal, the approach to therapy now known as Cognitive Behavior Modification gradually evolved. (Meichenbaum, 1977) As outlined in the theoretical rationale, this school of therapy bases its operations on the premise that the individual's self-instructions mediate behavior and any desired behavioral changes. Thus combining the efforts of pure behavioral theorists with those of the cognitively oriented practitioners would seem to offer a significant opportunity for lasting behavioral changes. While acceptance for the infusion of cognitive elements into behavior therapy is by no means universal, (Ledwidge, 1979) several of the studies reviewed below seem to indicate its applicability to the current study.

From its earliest stages of development, Cognitive Behavior Modification has been applied to the reduction of stress in a variety of stimulus conditions. Meichenbaum,

(1975) reports one of the earliest applications of his fully developed "stress innoculation training" in the treatment of anxiety states which precede known or anticipated stressors. Volunteer subjects were told they would receive an administration of an ischemic pain through the use of a blood pressure cuff. The experience of pain was described to them in great detail so as to elicit the maximum possible anxiety. Subjects were then tested for tolerance using this method. This procedure was repeated after subjects were exposed to a regime of stress innoculation training. Subjects receiving the training were able to tolerate the pressure cuff twice as long as control subjects, and also reported significantly fewer pain statements and anxiety statements.

Mc Cordick (1979) applied various aspects of Stress Innoculation Training to the reduction of test anxiety. In his experiment three treatment groups participated in a ten hour therapy program aimed at the reduction of test anxiety. Group A received basic Cognitive Behavior Modification (phase one of stress innoculation) plus some training in study skills. Group B received both of the above elements plus video taped models of successful coping strategies for testing situations. Group C participated in all of the above elements plus a rehersal phase--the complete stress innoculation training model. A waiting list control group and study skill control group were employed. Analysis of results showed that Group C improved significantly over the controls on two self-reported anxiety meas-

ures and on the Liebert-Morris Worry scale. Group B produced effective differences only on the Achievement Anxiety Test, and Group A on only one of the self reported measures. The authors conclude that the full stress innoculation model is indeed most effective in the reduction of test anxiety.

While studying the application of stress innoculation to the control of anger, Novaco (1979) specified two basic classes of cognitive processes central to the analysis of stress and its many effects and reactions. 1) the expectations of environmental demands and performances; 2) the appraisal of the demands and of the individual's performance. The model of stress innoculation outlined above illustrates the procedure he has utilized to treat anger by the stress innoculation method. Throughout his work Novaco noted that stress must be viewed in terms of transactions between individuals and the environment. Researchers must examine the "demand-coping processes that occur and develop over time. What may appear to be beneficial in the short run (i. e. high achievement drive and job involvement) may prove harmful in the long run (i. e. myocardial infarction)" p. 244

The differences in the selection of specific aspects of stress innoculation training that readers noted in the various studies led Jaremko (1979) to attempt to develop a uniform model for future research. He first reviewed the studies that surround each phase of stress innoculation procedures. The studies centering on the education phase posit this aspect as the sine qua non of the therapy. Indeed, much of the cognitive focus of this technique is lost

if a strong educational component is not included in the procedures. However, if none of the studies is this claimed as the sufficient condition for behavioral change or as the strongest element in the training program. The majority of studies that focus on the Rehearsal phase indicate that this combination of physical means of relaxation, cognitive restructuring and cognitive strategies is the most important element in the resultant behavioral change. However, the wide variety of procedures presented led Jaremko to conclude that no definitive statement as to the unique contributions of this stage can be made. He also notes that the Practice stage differs in almost every study surveyed. He proposes that future research view stress as a three stage process of a) physical arousal, (b) automatic appraisal, and (c) negative self-statements. The stress innoculation procedure could utilize physical coping mechanisms to intervene at stage (a) cognitive re-appraisal of stress at stage (b) and cognitive restructuring at stage (c). Thus systematic evaluation of the effectiveness of each of the components of stress innoculation for various stress situations and various populations could be developed and compared. To date, little of the systematic investigation that Jaremko advocates has been undertaken, possibly because of the difficulty of isolating the various elements of the treatment.

Anderson, Lawrence and Olson (1981) compared the differential effects that relaxation training and cognitive therapy had on tension/stress headaches in college students.

Fourteen students who had been medically diagnosed as suffering from tension headaches volunteered to participate in a therapy program designed to alleviate their symptoms. Each subject received either relaxation therapy only, cognitive therapy only, relaxation followed by cognitive therapy or both treatments together. While all treatments resulted in a marked lowering of reported headache pain, those subjects who received both treatments in combination reported a rapid, dramatic and highly significant drop in their headache occurrences. The authors conclude that this would indicate that this type of treatment is to be prefered in stress-related syndromes. One can readily observe that the combined treatment plan utilized by these researchers is basically a version of Stress Innoculation Training, and thus is contributing evidence for the value of the treatment in reducing some of the physical concomitants of psychological stress.

Emmelkamp and Mersch (1982) attempted to study the relative effectiveness of Cognitive therapy and Exposure In Vivo treatment programs for a group of 27 agoraphobics. Each patient (22 female, 5 male) was randomly assigned to a cognitive restructuring therapy group, a group centering around in vivo exposure and a group which combined both treatments. The in vivo group sessions consisted of a discussion of the phobia's, in vivo exposure to a situation, and a post-exposure discussion of the experience, feelings, etc. The cognitive group consisted of training in the notions of irrational beliefs and self-instruction. The combined group began in vivo exposure after the third cognitive session. Each group was assessed

after treatment using a behavioral exposure task, a phobic anxiety and avoidance scale, the Fear Survey Schedule, Internal-External Control Scale, the Adult self-expression Scale, and the Self Rating Depression Scale. All groups showed improvement on some post test measures, but only the combined model showed significant changes in both the in vivo measures and the questionnaire scales. Although some of the results tended to level out upon the follow up three months after post-testing, the authors conclude that the type of combined model utilized in their study offers significant hope in the treatment of phobias or other stress situations that are unavoidable.

In a rather unique study, Kendrick et. al. (1982) attempted to alleviate performance anxiety in musicians using cognitive and behavior therapy groups. Performance anxiety for this group of high achievers is behaviorally parallel to the stressful situations academic students face in the various "testing" situations they encounter. A group of 53 highly anxious pianists completed the State Anxiety Inventory, the Subjective Stress Scale and the Performance Anxiety Scale. Each musician was asked to play a concert/recital piece which they were told was to be video taped and rated by an independent judge for its musical quality. Heart rate and blood pressure were monitored immediately prior to, during, and immediately following the performance. In actuality the judges were rating the performers for behavioral signs of stress and errors that could be attributed to stress. Each individual participated in a three

week program of cognitive attentional training (self-instruction) or behavioral rehearsal. Upon treatment termination the video-taped performances were repeated as were the inventory measures. Surprisingly (to the authors) there were no significant differences on the post treatment measures. However, when the various measures were repeated 5 weeks after the completion of treatment both groups evidenced a significant reduction in their error rate on their scores on the Performance Anxiety Scale. In addition the cognitive group also showed a significant reduction in the behavioral stress measures. The authors conclude that both therapies seem effective in reducing this particular type of stress anxiety, but that a treatment that combines both types of therapy experiences might be the most beneficial. Both elements are integral aspects of Stress Innoculation.

Several studies have applied various forms of stress innoculation to students/children or educational professionals. Meng and Zastowny (1982) utilized stress innoculation measures to treat children who were preparing for a hospilalization and surgery. In the course of several months 35 children and their parents participated in the education phase of stress innoculation and the practice phase of self-instruction and relaxation. Each family kept a behavioral diary as the preparation for the hospitalization period progressed. While all the children and parents reported an increase in anxiety related behaviors as the hospitalization approached, those who part-

icipated in the training program reported far fewer behavioral signs of stress and anxiety. In addition both children and parents proved to be more cooperative with medical personnel during the course of hospitalization, and seemed to cope far better with the necessary threatening experiences encountered. While not a strictly controlled study it does serve to indicate the benefits of the Stress Innoculation model even with younger children experiencing severe stress.

Schlicter and Horan (1981) utilized Stress Innoculation to reduce anger and aggressive behavior in institutionalized delinquent boys. Twenty-seven patients completed an anger inventory task, the Imaginal Provocations Test, Role Play Provocations, and the Irrational Beliefs Test. In addition the staff recorded various behaviors indicative of anger and aggression. The patients were randomly assigned to a Stress Innoculation group, a relaxation training group or a no treatment group. While both treatments proved significant in the reduction of anger and aggression on the self-report measures, only the Stress Innoculation group actually experienced a significant reduction in measured behaviors. This is indeed important for in the area of anger control, or other behavioral signs of stress (such as the Type A behavior pattern) it is the behavior that must be changed--ultimately this indicates more meaningful success in therapy than paper/pencil measures.

Forman (1981) implemented a program of Stress Innoculation for school psychological staff members who reported

high levels of job related stress. Twenty individuals completed the State-Trait Anxiety Inventory and the Job Descriptive Index before participating in six weeks of stress innoculation. The group evidenced a significant decrease in anxiety as measured by the STAI and showed improvement in the evaluation of their work environment for feelings of work load and time deadlines. This study is of some importance to the current research for it indicates the effectiveness of Stress Innoculation for normal populations who evidence some of the behavioral symptomology of the Type A personality.

Several recent studies have attempted to relate the concepts of cognitive coping and cognitive therapy to the Type A Behavior pattern that is the subject of this investigation. Jenni and Wollersheim (1979) studies 42 individuals classified as Type A's by the standard interview technique. These were further catagorized as A1 (fully developed Type A pattern) N=16, or A2 (moderate Type A) N=26. All subjects were then randomly assigned to a) Stress Management Group consisting of muscle relaxation, b) a Cognitive Therapy Group consisting of cognitive restructuring and c) a waiting list control group. All completed the Bortner Rating Scale of Type A Behavior and the State-Trait Anxiety Inventory, and were measured for blood pressure and cholesterol levels. Analysis of the pre and post test results showed the cognitive group experienced the greatest reduction in the Bortner scale, and this was especially significant for the group class-

ified as A1. In addition, both treatment groups attained significant reduction in the State-Trait Anxiety Inventory. However, no significant reductions were noted in the physiological measures. The authors note that the results of this experiment argue for the inclusion of a strong cognitive element in any therapeutic process designed to reduce Type a behavior.

Pittner and Houston (1980) studies 84 college aged males to ascertain the coping styles of Type A subjects in response to various stress situations. The subjects were presented with several challenging perceptual-motor and cognitive tasks during which cardio-vascular responses were monitored and statements about inner states and perceived performance were elicited. Results showed that Type A individuals demonstrated a significantly higher level of cardio-vascular responses especially during the strong cognitive tasks, and even more so when the competitive nature of the taska was emphasized. Although the physiological measures noted a high level of arousal, Type A subjects tended to deny this and to supress statements of impatience, fatigue, etc. The authors surmise that this trait leads Type A performers to endure stress much longer than Type B's, to increase their self-drive in the face of high level cognitive tasks, and perhaps to delay seeking rest or even medical attention. They suggest that any therapy aimed at altering the Type A pattern must address the cognitive coping measures these individuals have developed. These conclusions have obvious and serious implications for

the population of academic high achievers under study in this investigation.

Roskies et. al. (1978) conducted an investigation surrounding the effects of two treatment plans on the Type A behavior pattern in working men. They begin by linking the Type A pattern to an excessive internalization of the Western values of mastery, achievement and control. Since these values are highly rewarded in our society it becomes a matter of great importance of maintain them at their highest level of effectiveness. Consequently individuals become anxious when they are faced with situations that threaten their level of mastery or when they feel that mastery slipping away. This anxiety is thus prevented and a feeling of mastery assured by the development of the Type A behavior pattern as the individual's usual method of coping with stress. They further state that although science is not certain what aspects of the Type A pattern are most dangerous and thus most in need of change, the clear link of this pattern with CHD argues for the development of preventive measures as rapidly as possible.

Twenty-five Type A men from high socio-educational strata volunteered to participate in the study. These men had no previous history of CHD and evidenced relatively low levels of cholesterol, triglycerides and blood pressure. Subjects were randomly assigned to a psychotherapy treatment group or a cognitive-behavioral treatment group. At the end of the fourteen week treatment program both groups changed significantly in the desired direction--

cholesterol levels were lower, measured sense of time urgency was reduced and psychological symptoms of stress were alleviated. Of greatest import, however, was the drastic drop in cholesterol levels evidenced by the cognitive-behavioral group. Of all the physiological contributors to CHD, cholesterol is the most directly linked with myocardial infarction.

In a study related to the notion of mastery described above, Brunson and Matthews (1980) investigated the reaction of Type A individuals to failure. The JAS was completed by 45 students who were then classified as Type A or Type B. The subjects were given practice on a visual discrimination task and then told they were to participate in a test of this skill. However, the four tasks presented were unsolvable. Results showed that the Type A's not only tended to utilize ineffectual strategies to solve the problem, but as the experiment progressed, tended to blame themselves for their failures. The Type B's however, tended to relate their failure to the difficulty of the task presented. The authors conclude that this tendency to focus blame on their own shortcomings in effect increases the stress of situations and heightens their need for achievement.

Smith and Brehm (1981) conducted an investigation to link various cognitive elements with the behavioral elements of the Type A behavior pattern. The JAS was completed by 149 college students (77 f, 72m). Subjects also completed the Thurstone Temperament Survey, the Jones Irrational

Beliefs Test, and the Fenigstein Self-Consciousness Scale. The students classified as Type A evidenced a significantly higher need for achievement, significantly higher standards of measuring their achievement, and a significantly higher tendency towards the active mastery of problems encountered in daily life. Since these cognitive components seem to be highly consistent with the measured behavioral components of the Type A pattern, the authors conclude that intervention programs that include both behavioral and cognitive foci are most likely to be successful.

As early as 1977 Rosenman and Friedman stressed the need to use several elements to modify the Type A behavior pattern. Twelve men who had suffered myocardial infarction were assigned to a group therapy program aimed at changing their entire approach to life. An attempt was made to modify their sense of time urgency and to demonstrate that they could continue to be successful in life without the harmful elements of the Type A pattern. An eight week program consisting of guided practice for self-observation, self-control and self-instruction was combined with instruction in progressive muscle relaxation. Interviews were conducted at the end of treatment that indicated that the participants were successful in modifying some of their behaviors and cognitions, but statistical data was not reported.

The research reviewed in this section indicates that stress innoculation can be an effective treatment method for several types of stress that relate to the current

study. It has proven helpful in the reduction of test anxiety, a common malaise of high achievers. The cognitive aspect of the treatment has been effective in reducing several indicators of the Type A pattern, though improvement in physiological measures have been less directly noted. It may be significant, however, that physical relaxation methods have in the past proven beneficial in the reduction of blood pressure, and the complete stress innoculation program includes training in deep muscle relaxation. A weakness in the cognitive behavior modification program that remains evident throughout all the studies, is the lack of definition of operant factors--what elements of treatment seem most important or most effective? However, previous research indicates that it is an appropriate treatment to utilize with Type A subjects, that it is appropriate to a student age population with "scholar type stress reactions," and that its combination of cognitive and physical methods may offer a new, more effective prevention plan than has yet been applied.

C. Population

The population chosen for this investigation consisted of a group of academically superior junior high school students from the Norfolk, Virginia Public School system. Several factors contributed to the selection of this population. First of all the popular press is filled with articles about the pressures faced by young people, especially the pressure to succeed. This is even stronger for the high achieving student who is motivated to do well and encouraged to excel. Intense disappointment is often the response to even moderate setbacks, and self-deprivation of sleep, social activities, sports, etc. for the sake of greater academic achievement is commonplace. In short, it seems that many of these students are indeed under the type of stress conducive to the development of the Type A behavior pattern. Although the research in this area is paltry, the little that has been published indicates that further investigation is warranted. Phillips (1978) notes that the process of constant evaluation that students face is a source of great stress for those from whom society demands ever greater achievements. He relates a study conducted by Atkinson which structured an approach-avoidance situation for elementary students. Various means (self-report, physical measures, observation) were utilized to monitor the subjects' stress reactions. Those students who evidence the greatest need for achievement and the strongest concern about failure evidenced the greatest stress. This indeed describes many of our high achieving

students.

To date there have been no studies to assess the prevalence of Type A behavior in superior adolescent studies. However, several researchers have conducted investigations into various aspects of the Type A pattern in students identified as Type A individuals. In trying to correlate other psychological measures with the Type A pattern, however VanDijl (1978) did find that the Rating Statement List demonstrates that Type A's were more achievement oriented, more ambitious and showed a more positive attitude towards work than type B individuals. In an unpublished dissertation, Kellman surveyed 284 Veterinary students to determine the aspects of training they felt were the most stressful. While the areas identified were those one would expect, (tests, lack of social time, grade pressure) the range of responses have most striking implications for this research. The most academically talented students, those who were used to high grades, reported the most stress. Indeed these students seemed anxious regardless of the actual environmental conditions that were operating on them at the time of measurement.

Hicks and Schretler (1981) studies the change in measured level of Type A behavior in college students over the four year progress of a college career. Students at San Jose State University (N=1276) completed the Jenkins Activity Survey each year of their college residence. Analysis of these surveys indicated that those students initially identified as Type A as freshmen evidenced an

increase each year. Over the course of the four year study, the Type A students increased their JAS scores by 1.2, a significant growth in this measure of Type A behavior. It seems then that the further these individuals progress in their academic/professional preparation the more likely they are to increase their entrenchment into the Type A pattern of life.

Further evidence for a link between physical problems and the Type A pattern in college students was provided through a study by Barton, et. al (1982). After a review of the research linking allergy reactions and hypertension, and allergy reactions and Coronary Heart Disease, the authors predicted that Type A individuals would evidence more allergies than Type B individuals. Over 300 students completed the Jenkins Activity Survey and a detailed medical history. Of the Type A students, over 50% reported allergies of some type. Only 28 % of the Type B students reported ever suffering from any allergy symptoms. While allergies are not direct contributing factors to CHD, they have been linked with other stress related syndromes such as asthma, and hypertension. The authors conclude that this study offers further evidence for the widespread deleterious effects of the Type A pattern.

A study was conducted by Somes, Garrity and Marx (1981) to clarify the linkage between the Type A behavior pattern and significant life change events in college students. Previously reported research had concentrated on older populations for the simple reason that they tend to evid-

ence a greater number of more significant changes than do younger persons. Out of a group of 214 students that completed the Anderson schedule of recent experiences, the Langner Psychiatric Impairment Scale and a health questionnaire, 174 were interviewed using the standard interview form for the identification of the Type A pattern. Although the Type A's showed no difference in reported health problems, they did score significantly higher on the life change scale. Some hypothesizes that the interactive effects of the Type A pattern and life events may not be reflected in medical problems until later in life. However, previous evidence indicates that these effects are most serious once manifested and thus warrant some type of intervention.

In an attempt to link the Type A pattern with academic aspirations and success (as opposed to employment oriented success) Ovcharchyn, Johnson and Petzel (1981) surveyed a volunteer college population. Questionnaires concerning current academic activities, extra-curricular activities, expected grade point average, pressure to attend college, importance of academic success, study habits, and the Jenkins Activity Survey were completed by 132 college freshmen (41 m, 91 f). An analysis of the instruments revealed that Type A students attempted more credit hours and outside activities, tended to increase their course work during a semester, set higher achievement goals (even when adjusted for ability levels) placed greater importance on high grades, were under more pressure to attend college and indeed att-

ained higher grade point averages as freshmen than did their Type B counterparts. All of the reported measurements were statistically significant. The authors conclude that this overwhelming evidence of the highly developed Type A pattern in college freshmen argues for serious study of this concern in younger populations.

In an earlier study, Butenski et. al (1976) tried to identify at what age children evidence an increased prevalence and intensity of Type A behavior. Standard interviews were conducted with 174 children in the 5th, 9th and 12th grades in both rural and urban school divisions. Data analysis revealed that while there was far more prevalence of the Type A pattern in urban (specifically suburban) than in rural children there were no significant age or sex patterns. This could be evidence for an extremely early development of the Type A pattern and thus argues for further research with younger children.

In a study somewhat contradictory of Butenski, Wolf, et. al. (1981) found evidence for an age linked increase in the Type A pattern in children. These researchers administered the Piers-Harris Self Concept Test, the Nowicki-Strickland Locus of Control Scale for Children and the Hunter-Wolf A-B Scale for children to 384 students, aged 10-17. The results showed that whites scored higher than blacks on the Type A scale and that the pattern increased directly with age, about one point per year in the A direction. They conclude that Type A's are thus made and not born and that intervention may indeed be able to prevent

further entrenchment or reverse the pattern.

Lawler and Allen (1981) attempted to relate the Type A pattern to evidence of hypertension in children. Using family history as a predictor of risk they studies 39 students, aged 11-13 who as yet showed no evidence of the syndrome. After completing the Bortner rating scale of Type A behavior, measurements of blood pressure, pulse rate and skin conductance were taken. Several word unscrambling tasks were presented to each child during which their physical responses to stress were measured. Although the children who evidenced higher blood pressure upon the initial measurements reacted very much like adult hypertensives, no relationship with the Type A pattern was found. Lawler states that this indicates that a different set of behavioral components might be operative for hypertension than for the Type A pattern. However, the child who is Type A and who then later develops hypertension seems to be most strongly at risk for some type of coronary disease.

D. Jenkins Activity Survey

The initial method developed for the assessment of the Type A behavior pattern was a standard interview consisting of 22 items. These questions were designed not only to seek information about the individual, but also to elicit some of the characteristics of the Type A syndrome from the subject during the interview. (Rosenman, 1979). Of necessity then, the interviewers had to be trained in the specific techniques of this method, and their statements of assessment standardized. Indeed, their findings had to be replicated

by an independent set of judges in order to produce replicative validity of the interview technique. While this was successfully accomplished by Rosenman and his colleagues, the training of an interviewer takes approximately two weeks, and each interview requires about twenty minutes. It is thus expensive in both time and money--a definite detriment to independent researchers.

A systematic attempt at the development of a paper and pencil measure of the Type A pattern resulted in the Jenkins Activity Survey (Jenkins, Rosenman, Friedman,1975). Initially a 64 item questionnaire was evolved from the standard interview and was administered to 100 persons from the Western Colloborative Group Study who had previously been classified as Type A or Type B. Forty of these items were found to discriminate between the two groups. These 40 items, as well as an additional 21 questions were then mass administered to over 700 persons from the WCGS. Results of this administration showed that the Jenkins Activity Survey correctly identified 74% of the Type A persons classified as such by the interview. These results were consistent regardless of the individual's age or previous history of coronary heart disease.

In a more recent study, Jenkins, Zyzanski, and Rosenman (1971) mass administered the JAS to the participants of the WCGS. This survey showed an overall agreement rate of 73% with the interview, but also yielded important information about the other scales of the survey. Speed-impatience, Hard Drivingness and Job-involvement are personality

characteristics known to be associated with the Type A pattern, but not identical to it. These characteristics are also scaled on the JAS. An analysis of the almost 3000 surveys returned in this study showed the various inter-scale correlations to be low, thus indicating that the Jenkins Activity Survey could accurately measure the various contributing factors. In addition, it was found that the JAS correctly classified individuals according to their level of Type A or Type B involvement.

A subsequent large scale study by Shekelle, Schoenberger, and Stamber (1975) attempted to relate the JAS to demographic variables, as well as to factors known to contribute to Coronary Heart Disease. Over 4000 persons in the Chicago area completed the Jenkins Activity Survey (ages 25-64). A very strong positive correlation was found between the Type A pattern as measured by the Jenkins and the socio-economic status of the individuals as indicated by educational/occupational level. ($p.<.001$) This was valid for every age category, although the relationship was actually somewhat stronger for younger respondents. Surprisingly, the Type A classification was not related to sex or to the "traditional risk factors" of high cigarette smoking, high blood pressure, and high cholesterol. While other researchers have found Type A persons in every occupational level, (Rosenman, 1974) the results of this report are indeed significant, for the majority of high achieving students attain a high level of educational and occupational status.

In a purely statistical report, Dembroski (1979) found that the Jenkins Activity Survey can claim as overall classification agreement with the standard interview of 70%+, a 90% agreement for both the extreme Type A and extreme Type B groups, and a .65 test-retest reliability. Various validity measures have been conducted with the Thurstone Temperament Survey, the MMPI, ACL, CPI, 16Pf, Rotter I-E and other instruments. All studies indicate that the Jas measures characteristics independent of these traditional personality assessment measures. Dembroski concludes that concurrent, predictive and construct validity can be claimed for the Jenkins instrument. He urges that further research be aimed at the utilization of the survey with different populations.

As can be noted from the literature and from a cursory review of the items on the Jenkins, the instrument was initially developed for use with employed adults. Palladino and Tryon (1980) report the results of a study of a new developed Form T of the JAS for use with college populations. The authors sought to ascertain the overall validity of this Form of the JAS and to see if differences existed between the sexes or between rural vs urban subjects. An analysis of the results showed no significant differences between rural and urban students. This supports generalization of results of research using this instrument. They also note a surprising lack of male-female disparity thus indicating that the Type A pattern may indeed be spreading rapidly among females. A moderate

Kuder-Richardson reliability index of +.70 was noted, and the instrument was determined to be valid for use with all student populations.

The above studies tend to support the use of the Jenkins Activity Survey in the present research. It has been shown to be a valid instrument to screen individuals for Type A behavior, and is much more suited to use with students than is the long standard interview. Although the majority of investigators have been conducted with the Form C, or adult version, the Form T validated for college students contains the same items as the Form C with wording changes only. Thus when the adult form refers to "job or work" the student version refers to school. The student version was found to correlate highly (.80) with the adult version (Glass, 1977). With minor wording modifications the Form T is well suited for use with secondary school students, especially those in a college preparatory curriculum. A copy of the instrument is included in Appendix A.

E. Summary

Although the research reviewed in this section is far from all inclusive, it does indicate the need for the present study. The evidence for the contributions of the Type A behavior pattern to Coronary Heart Disease is indeed comprehensive. However, research into the etiology of this syndrome is only beginning. It seems important that increased efforts be directed towards establishing the mode of acquisition of this risk factor, for Type A persons do not become so at age 40. The syndrome is well established as the normal response pattern long before any evidence of CHD is noted. Of perhaps even greater import, however is the development of methods to reduce this pattern and to teach individuals alternative methods of coping with stress. The preliminary applications of Cognitive Behavior Modification to this area seem successful enough to offer encouragement to further research. However, these efforts have not been utilized in the modification of general behavior patterns with students. Previous applications have focused on specific or localized behaviors. In addition, as of this writing, the full Stress Innoculation Training has not been applied to the Type A behavior pattern, though as noted, various portions of it have been used with some success (Jenni, 1979). The proposed research has attempted to address both of these important concerns by: 1) identifying the Type A behavior pattern in secondary students. Although a few studies have been conducted

with younger children (Matthews, 1976), and two of the studies cited above focused on adolescents, the majority of research into the type A pattern has concentrated on adult males. 2) Applying the complete program of Stress Innoculation Training to the general Type A behavior pattern. In addition this project has attempted to determine if subjects participating in the treatment exhibit any direct loss of achievement motivation or demonstrated achievement as a result of the therapy process.

The students who have comprised the population for this study live under constant pressure to succeed in the academic arena. This pressure may indeed facilitate the development of the Type A pattern. As noted above many of the characteristics of this pattern are those that are not only very evident in high achievers, but are also encouraged in them. It is imperative that the prevalence of the Type A behavior pattern in superior students be empirically validated, and that some means of successful modification be developed. To date no studies have been published dealing directly with the Type A pattern in academically superior students, even though it seems obvious that these students are most susceptible to its development.

Three primary questions have guided this research:

1) Do academically superior students exhibit a great prevalence of Type A behavior?

2) What are the effects of group application of Stress Innoculation Training on the Type A behavior as well as the

achievement motivation of these students?

3) Are academically superior students able to maintain their high level of achievement during a treatment program aimed directly at reducing some of the Type A behavior that may have contributed to their success?

Chapter III. Methodology

A. Population.

The population for this study consisted of the top 10% of the first quarter honor roll students at three public junior high schools in Norfolk, Virginia. The Norfolk Public School system is comprised of approximately 35,000 students, a large proportion of whom are dependents of active duty military personnel. Although the city population is approximately 35% Black, all secondary schools in the city are 55-60% Black.

The total population (N=200) completed the Jenkins Activity Survey. Students were then classified as either Type A or Type B. The Type A students (N=90) were then randomly assigned to one of the two treatment groups in their school, or to a waiting list control group.

Since the design utilized in this experiment required that there be no significant differences in the level of Type A behavior between each group, an analysis was made of the Jenkins Activity Survey scores. Table One presents the means and standard deviations for the JAS scores for each group and the total population of the study. Student's T-test was utilized to compare each group mean with the mean of the population to determine if any group was significantly more Type A or Type B. The t was found to be insignificant in each case. These results are reported in Table Two.

Table One

Jenkins Activity Survey

Pre-Treatment Scores

GROUPS

			A	B	C
	I	m	9.4	9.7	9.7
		sd	1.43	1.49	1.48
Schools	II	m	10.2	9.5	9.7
		sd	2.34	1.98	1.82
	III	m	9.5	9.2	8.8
		sd	2.53	2.25	2.09

Total Population: m= 9.522

sd= 1.927

Table Two

Pre-treatment JAS Scores

Statistical Analysis

		mean	t	df	two-tail
	Group A	9.4	-.2698	8	.50+
School I	Group B	9.7	.3766	8	.50+
	Group C	9.7	.3766	8	.50+
	Group A	10.2	.91	8	.30+
School II	Group B	9.5	-.0355	8	.50+
	Group C	9.7	.3077	8	.50+
	Group A	9.5	-.0268	8	.50+
School III	Group B	9.2	-.4523	8	.50+
	Group C	8.8	-1.088	8	.30+

B. Procedures.

The six counselors participated in a two hour training session designed to present the treatment modality to be utilized. Cognitive Therapy and Behavior Modification are familiar to most master's degree level counselors, so the majority of training time was devoted to the blending of the two methods into Cognitive Behavior Modification. All counselors are regular employees of the Norfolk Public School system and are regularly assigned to the schools from which the student participants were drawn. Each treatment was broken down into five sessions, detailed outlines for which are found in Appendix B.

Treatment consisted of five one hour group sessions. Each group was comprised of 10 students and one counselor. Sessions were scheduled during the school day, and were held on a rotating schedule of days and periods to avoid undue interference with the instructional program. Arrangements were made to award some type of assignment credit to the participating students. The counseling sessions followed the outline in Appendix B as closely as possible. After each session the group leader completed a short reaction form to note any deviations from the prescribed program. Every two weeks the counselors met with this researcher to insure uniformity in the treatments as much as possible.

At the conclusion of the five week program the students completed both direct and indirect measures of the Type A behavior pattern. These measures included: the

Timed Arithmetic Task to measure achievement striving; a Time Estimate Task and a Writing Speed Task to assess time urgency; and The Gough Adjective Check List to measure the need for achievement. In addition a comparison was made between the third Quarter grade point averages of the experimental and control group subjects.

C. Instrumentation.

The development and validation of the Jenkins Activity Survey has been described at length in Chapter II of this presentation.

The remaining direct measures are portions of the Type A rating scale designed by Bortner (1967). Bortner began the development of this behavioral measure by administering 24 tasks to a group of 76 volunteers who had previously been classified as Type A or Type B by the standard interview. Of these 24 tasks, eleven were identified through multiple regression techniques as contributing significantly to the measurement of Type A. The over-all agreement rate of these items with the standard interview classification was 77%, thus indicating that the series of tasks does provide a valid measurement. Interesting enough, the tasks did not correlate at all with the Jenkins scores of these students (+.02) which seems to indicate that the Bortner scales may be a complimentary tool to the JAS that recaptures some of the behavioral nuances of the interview lost by a paper and pencil measure. This lends further validity to the use of the Bortner as a post-treatment measurement device in the current research.

The Timed Arithmetic Task consists simply of a group of 200 simple problems in addition, subtraction, multiplication and division. The students are instructed that they will have exactly four minutes in which to complete the task. They are to begin with the first problem and are to solve each problem before going on to the next

problem. This task has been utilized in several experiments by Glass (1977) to provide a measure of achievement striving. For the purposes of experiments involving measurement of the Type A pattern we are concerned only with the number of items attempted, not with the error rate.

The measures of time urgency are rather direct behavioral observations. Type A individuals have a tendency to become impatient and report that a specified time interval has elapsed sooner than do Type B's. Their estimate is generally too rapid. In this experiment subjects were asked to sit quietly with their eyes closed. They were told that they were to indicate the passage of one minute without counting the seconds or looking at a watch. A signal from the examiner began the time period. In addition, Type A's have difficulty slowing down on daily tasks. This was measured by the Writing Speed Task. Each subject is asked to write the words "The United States of America" at his regular writing speed, very rapidly, slowly, and very slowly. Three scores are computed to reflect speed and impatience: 1) slow minus regular writing speed, 2) regular minus fast, and 3) very slow divided by regular. In Bortner's study (1967) these two tests were found to provide valid measures of time urgency and to contribute significantly to the over-all measurement of the Type A pattern.

The Gough Adjective Check List is utilized as a post test measure to determine if the treatment in any way effected the participant's measured need for achievement. The ACL scale which measures this need was found to correlate

rather highly with the JAS Type A score (.43) by Glass (1977). Several authors have noted (Friedman & Rosenman, 1974) that Type A's are very concerned that any change in their behavior will result in lower achievement or success. While this is not a necessary corollary to a reduction in Type A behavior (since successful Type B's have been found in many occupational areas), it is indeed a cause for concern in any study which is attempting to reduce Type A behavior. The ACL achievement scale provides a measure of this need which is not necessarily linked to behavior and thus yields information concerning the subject's internal motivation. This standardized instrument has been widely used in research with diverse groups. The achievement scale demonstrates a test-retest reliability of .81 for males, .74 for females on a population similar to the one selected for this research. This scale has been found to correlate significantly with measures of achievement on the California Psychological Inventory and on non-test indices of achievement, thus indicating that it provides a valid measure of this personality dimension. (ACL manual, 1980).

The individual's grade point average has become almost a traditional means to measure achievement among student populations. Both Glass (1977) and Ovcharchyn (1981) demonstrated that Type A students generally earn higher grade point averages than do Type B subjects of the same ability level. In this experiment the grade point average was utilized to determine if the treatment in any way diminished

the achievement level of the participants. As noted above Type A individuals are concerned that if they alter their behavior pattern they will be unable to maintain their self-determined superior level of achievement. Thus if any treatment aimed at modifying the behavior pattern is to be readily accepted, it must be demonstrated that achievement levels can be maintained.

D. Design

Design consisted of a 3 X 3 factorial design to test for treatment effects, school effects and interaction effects.

Treatments-Factor A

		A1	A2	A3
	B1	M11	M21	M31
Schools-Factor B	B2	M12	M22	M32
	B3	M13	M23	M33

$$\text{Treatment Effects} = \frac{M11+M12+M13}{3} = \frac{M21+M22+M23}{3} = \frac{M31+M32+M33}{3}$$

$$\text{School Effects} = \frac{M11+M21+M31}{3} = \frac{M12+M22+M32}{3} = \frac{M13+M23+M33}{3}$$

Interaction Effects = (A X B) Treatment X School

This design is a post-test only control group design (Campbell & Stanley, 1963):

R	X1	01	Treatment Group 1, School 1
R	X1	02	Treatment Group 2, School 1
R		03	Control Group, School 1
R	X1	04	Treatment Group 1, School 2
R	X1	05	Treatment Group 2, School 2
R		06	Control Group, School 2
R	X1	07	Treatment Group 1, School 3
R	X1	08	Treatment Group 2, School 3
R		09	Control Group, School 3

This design is appropriate because both the participants and the therapists are truly randomly assigned. It controls for history because events in time that might produce an effect on 01 are likely to produce similar effects on 02, 03, etc. Particular events which may be unique to one treatment group were noted in the counselor's post-session notes. No significant deviations from the prescribed treatment plan were noted by any of the counselors.

Maturation and testing were controlled since they were the same in all treatment groups as well as the control groups. The standardized, short written response format of the measurement instruments utilized in the study controls for instrumentation. The verbal directions of the Time Estimate Test and the Writing Speed Task were standardized. The tester who administered the tasks to all participants was not aware of which students were assigned to which group. In addition, the same time measuring

device was used to measure responses of all subjects.

Randomization controlled for selection. No students "dropped out" of the experiment during the treatment period. Since no student missed more that one session in any of the groups, mortality did not effect the results.

The selection-maturation interaction is controlled, although there could be some "spontaneous improvement" in the controls that may be masked by the treatments. This design may not control for the interactive effects of selection and treatment or for the reactive effects of experimental arrangements. (Campbell & Stanley, 1966)

The factorial design of this experiment allows the analysis of the effects of both independent variables (treatment and schools) as well as the interactive effects of these variables on the dependent measures. This broadens the conclusions about the treatment itself, and yields valuable data about the implementation of the treatment. In addition the two way analysis of variance reduces the amount of error variance in the F-ratio and thus provides a stronger test of significance than would a one way analysis (Kerlinger, 1973).

E. Specific Null Hypotheses

HO1 There is no significant difference in the measurement of achievement level of students between the treatment and control groups.

HO2 There is no significant difference in the measurement of achievement level of students from different schools.

HO3 There is no significant interaction effect between treatment and schools on the measurement of achievement level.

HO4 There is no significant difference in the measurement of achievement striving of students between the treatment and control groups.

HO5 There is no significant difference in the measurement of achievement striving of students from different schools.

HO6 There is no significant interaction between treatment and schools on the measure of achievement striving.

HO7 There is no significant difference in the measurement of Time Urgency between treatment and control groups.

HO8 There is no significant difference in the measurement of Time Urgency in students from different schools.

HO9 There is no significant interaction on the measurement of Time Urgency between treatment and schools.

HO10 There is no significant difference in the measure of need for achievement in students between treatment and control groups.

HO11 There is no significant difference in the measure of need for achievement in students from different schools.

HO12 There is no significant interaction between treatment

and schools on the measured need for achievement.

F. Statistical Analysis

Data were analyzed using the analysis of variance. The structure of the experimental conditions met the requirements for this statistical technique since:

a) the samples were randomly selected

b) the population to which the results were generalized is normally distributed.

c) the variances of the several subgroup populations are homogeneous for all subgroups (minium, 1970)

All hypotheses were tested using the F ratio (ANOVA). Each null hypothesis was rejected at the .05 level of significance. If analysis yielded a significant F value for main effects, a post hoc comparison of each mean was made using the Dunnett's multiple comparison test.

G. Summary of Methodology.

The population consisted of the top 10% of seventh and eighth graders in three Norfolk, Virginia junior high schools. Students from this population who were identified as Type A individuals were randomly assigned to one of three experimental groups in their school. Two groups in each school participated in the treatment of Stress Inn-oculation Training, the third group served as a waiting list control group. These students were afforded an opp-ortunity to participate in the treatment program at the completion of the experiment. Six counselors were trained to implement the treatment in a group setting of 10 stu-dents. The counselors were randomly assigned to the treatment groups, although each counselor worked with stu-dents from his/her home school. Each treatment group met for five weeks, once per week, one hour per session. Coun-selors adhered strictly to the script developed for each treatment session, and completed post-session anecdotal notes to identify any descrepencies or events which might have inadvertently affected the treatment. At the end of the treatment period all subjects and controls completed the Adjective Check List, two behavioral measures of time urgency, and the Timed Arithmetic Task. Data were anal-yzed using a 3 X 3 (treatment x school) factorial design Analysis of variance, and when needed, post hoc comparisons were used to test the significance of each hypothesis at the .05 level. Subjects had written parental permission to take part in the experiment. All participants received

an explanation as to the exact purpose and meaning of the experiment and of the results at its conclusion. The study was approved for implementation by the Research Department of the Norfolk Public Schools, the Principal of each participating school, and the Human Subjects Committee of the College of William and Mary.

Chapter IV RESULTS

The results of this experiment are presented in this chapter according to hypotheses. The three hypotheses which center around each factor of measurement of the Type A behavior pattern are discussed together to facilitate the application of the results.

Hypothesis One

There is no significant difference in the level of achievement of students between the treatment and control groups.

Two way analysis of variance of the post-treatment grade point averages resulted in no significant difference between the treatment and control groups in their demonstrated level of achievement. $F(2,81) = .5866$ $p < .20$. Hypothesis One was therefore accepted at the .05 level of confidence. The means and standard deviations of the post-treatment grade point averages are reported in Appendix C. Table Three presents the relevant statistical data on the analyses conducted for Hypotheses One, Two and Three.

Hypothesis Two

There is no significant difference in the level of achievement of students from different schools.

Two way analysis of variance of the post-treatment grade point averages resulted in a significant difference between the various schools. $F(2,81) = 4.311$ $p < .025$. Null hypothesis two was therefore rejected at the .025 level of significance.

Hypothesis Three

There is no significant interaction effect between treatments and schools on the level of student achievement.

Two way analysis of variance of the post-treatment grade point averages resulted in no significant interaction effect on this measure of student achievement. $F(4,81) =$

Table Three

Hypotheses One, Two, and Three

Post-Treatment Grade Point Averages

Source of variance	sum of squares	degrees of freedom	mean square	F	significance level
Total	24.897	89	-	-	-
Treatments	.281	2	.1405	.5866	.20
Schools	2.065	2	1.0325	4.311	.025
Treatment X School	3.144	4	.786	3.281	.10
Error	19.407	81	.2395	-	-

3.281 p $<$.10. Hypothesis Three was therefore accepted as stated.

Hypothesis Four

There is no significant difference in the measurement of achievement striving between the treatment and control groups.

Two way analysis of variance of the scores obtained on the Timed Arithmetic Task resulted in no significant difference between the treatment and control groups on the achievement striving dimension of the Type A behavior pattern. $F(2,81) = .5864$ p.$<$.20. Hypothesis Four was therefore accepted at the .05 level of significance. The means and standard deviations of this measure are reported in Appendix C. Table Four presents the relevant statistical data on the analyses conducted for Hypotheses Four, Five and Six.

Hypothesis Five

There is no significant difference in the measurement of achievement striving of students from different schools.

Two way analysis of variance resulted in no significant difference in the scores on the Timed Arithmetic Task of the students from the different schools. $F(2,81) = .7247$ p$<$.20. Hypothesis Five was therefore accepted at the .05 level of significance.

Hypothesis Six

There is no significant interaction effect between

TABLE FOUR

Hypotheses Four, Five and Six

Achievement Striving

Timed Arithmetic Task

Source of variance	Sum of squares	Degrees of freedom	Mean square	F	significance level
Total	39616.989	89	-	-	-
Treatments	535.155	2	267.577	.5864	<.20
Schools	661.433	2	330.716	.7247	<.20
Treatment X School	1459.901	4	364.975	.7998	<.20
Error	36960.500	81	456.302	-	-

treatment and schools on the measurement of achievement striving.

Two way analysis of variance resulted in no significant interaction effect on the scores obtained on the Timed Arithmetic Task between the schools and treatment groups involved in the experiment. $F(4,81) = .7998$ $p < .20$. We were therefore unable to reject null and accept hypothesis six as stated.

The above analyses indicated that the intervention produced no significant differences in the achievement striving of the Type A students involved in this experiment.

Hypothesis Seven

There is no significant difference in the measurement of Time Urgency between treatment and control groups.

As indicated in Chapter III, several tasks were utilized to measure the time urgency dimension of the Type A behavior pattern. One score is obtained for each individual on the Time Estimate Task; three scores are derived for each individual on the Writing Speed Task.

Two way analysis of variance of the scores obtained on the Time Estimate task resulted in no significant difference between the experimental groups and the control group. $F(2, 81) = .0802$ $p < .20$. The means and standard deviations for the Time Estimate Task are found in Appendix C. Table Five contains statistical results for the various analyses conducted on this measure.

Table Five

Hypotheses Seven, Eight and Nine

Time Urgency

Time Estimate Task

Source of variance	Sum of squares	Degrees of freedom	Mean square	F	Significance level
Total	20917.7	89	-	-	-
Treatments	38.46	2	19.23	.0802	<.20
Schools	943.53	2	471.76	1.968	<.20
Treatment X School	519.81	4	129.95	.5421	<.20
Error	19415.3	81	239.69	-	-

Score I of the Writing Speed Task is obtained by subtracting the regular writing speed (in seconds) from the slow writing speed. Two way analysis of variance conducted on this measure resulted in no significant difference between the experimental groups and control groups. $F(2,81) = 1.807$ $p < .20$. Means and standard deviations for the Writing Speed Task Score One are found in Appendix C. Table Six presents the statistical results for this measurement.

Score Two of the Writing Speed Task is obtained by subtracting the fast writing time from the regular writing time for each individual. Two way analysis of variance conducted on this measure resulted in no significant difference between the treatment groups and control groups. $F(2,81) = .0404$ $p < .20$ Means and standard deviations for the Writing Speed Task Score Two are found in Appendix C. Table Seven presents the statistical results of the analyses conducted on this measure.

Score Three of the Writing Speed Task is obtained by dividing the slow speed by the regular speed for each individual. Two way analysis of variance conducted on this measure resulted in no significant difference between the treatment groups and the control groups. $F(2,81) = 1.571$ $p < .20$. Meand and standard deviations for the Writing Speed Task Score Three are found in Appendix C. Table Eight presents the results of the statistical analyses conducted on this measurement.

Since no significant differences between treatment and control groups were found on any of the four measures of

Table Six

Hypotheses Seven, Eight and Nine

Time Urgency

Writing Speed Task-Score One

Source of variance	Sum of squares	Degrees of freedom	Mean square	F	Significance level
Total	31672.656	89	-	-	-
Treatments	1224.522	2	612.261	1.807	<.20
Schools	2314.119	2	1157.059	3.415	<.05
Treatment X School	691.615	4	172.903	.5103	<.20
Error	27442.4	81	338.795	-	-

Table Seven

Hypotheses Seven, Eight and Nine

Time Urgency

Writing Speed Task - Score Two

Source of variance	Sum of squares	Degrees of freedom	Mean square	F	Significance level
Total	360.956	89	-	-	-
Treatments	.289	2	.1445	.0404	<.20
Schools	60.089	2	30.044	8.403	<.001
Treatment X School	10.978	4	2.744	.7675	<.20
Error	289.600	81	3.575	-	-

Table Eight

Hypotheses Seven, Eight and Nine

Time Urgency

Writing Speed Task- Score Three

Source of variance	Sum of squares	Degrees of freedom	Mean square	F	Significance level
Total	172.321	89	-	-	-
Treatments	5.877	2	2.938	1.571	<.20
Schools	11.939	2	5.969	3.191	<.05
Treatment X School	2.97	4	.742	.3967	<.20
Error	151.535	81	1.870	-	-

the time urgency dimension of the Type A behavior pattern, null hypothesis Seven is accepted.

Hypothesis Eight

There is no significant difference in the measurement of Time Urgency in students from different schools.

Two way analysis of variance of the scores obtained on the Time Estimate Task resulted in no significant difference between the three schools involved in the experiment. $F(2,81) = 1.968$ $p < .20$.

Two way analysis of variance of Score One of the Writing Speed Task resulted in a significant difference between the three schools involved in the experiment. $F(2,81) = 3.415$ $p < .05$

Two way analysis of variance of Score Two of the Writing Speed Task resulted in a significant difference between the three schools involved in the experiment. $F(2,81) = 8.403$ $p < .001$

Two way analysis of variance of Score Three of the Writing Speed Task resulted in a significant difference between the schools involved in the experiment. $F(2,81) = 3.191$ $p < .05$

Since three of the four measures of Time Urgency resulted in a significant difference in school effects the null hypothesis is rejected.

Hypothesis Nine

There is no significant interaction effect on the

measure of Time Urgency between schools and treatments.

Two way analysis of variance of the scores obtained on the Time Estimate Task resulted in no significant interaction between schools and treatment. $F\ (4,81) = .5421$ $p < .20$

Two way analysis of variance of Score One of the Writing Speed Task resulted in no significant interaction between schools and treatment on this measure of time urgency. $F\ (4,81) = .5103$ $p > .20$

Two way analysis of variance of Score Two of the Writing Speed Task resulted in no significant interaction between schools and treatment. $F\ (4,81) = .7675$ $p < .20$

Two way analysis of variance of Score Three of the Writing Speed Task resulted in no significant interaction between schools and treatment on this variable. $F\ (4,81) = .3967$ $p < .20$

Since none of the four measures of Time Urgency indicated a significant interaction effect between schools and treatments, null Hypothesis Nine is accepted as stated above.

Hypothesis Ten

There is no significant difference in the measurement of need for achievement in students between treatment and control groups.

Two way analysis of variance of the scores obtained on the Achievement Scale of the Gough Adjective Check List resulted in no significant difference between the treatment

and control groups. $F(2,81) = .5679$ $p < .20$. Hypothesis Ten was therefore accepted as the .05 level of confidence. The means and standard deviations of the ACL achievement scores are reported in Appendix C. Table Nine presents the results of the statistical analyses conducted on this measurement.

Hypothesis Eleven

There is no significant difference in the measurement of need for achievement in students from different schools.

Two way analysis of variance of the scores obtained on the Achievement Scale of the Adjective Check List resulted in no significant difference between the students from different schools. $F(2,81) = .0706$ $p < .20$. We were therefore unable to reject null and Hypothesis Eleven was accepted as stated.

Hypothesis Twelve

There is no significant interaction between treatments and schools on the measured need for achievement.

Two way analysis of variance of the scores obtained on the Achievement Scale of the Adjective Check List resulted in no significant interaction between treatments and schools on this measurement. $F(4,81) = .4710$ $p < .20$. Hypothesis Twelve was therefore accepted.

Since none of the analyses of the measured need for achievement resulted in any significant differences between groups or schools, nor any interaction effect, we can conclude that the intervention in no way affected the need for

achievement in these Type A students.

Table Nine

Hypotheses Ten, Eleven and Twelve

Need for Achievement

ACL Achievement Scale

Source of variance	Sum of squares	Degrees of freedom	Mean square	F	significance level
Total	3218.5	89	-	-	-
Treatments	43.399	2	21.699	.5679	<.20
Schools	5.4	2	2.7	.0706	<.20
Treatment X School	74.001	4	18.5	.4710	<.20
Error	3095.7	81	38.209	-	-

Further Analyses

As indicated in the discussions of hypotheses seven, eight, and nine above, significant differences were found between the different schools in the experiment on all three of the derived scores of the Writing Speed Task. The Dunnett's multiple-comparison test was utilized to determine which between school means were in fact significantly different.

Analyses of Score One of the Writing Speed Task resulted in the following comparions (critical difference = 12.68):

School I vs II: 39 - 13.26 = 25.74

School I vs III: 39 - 11.33 = 27.67

School II vs III: 13.26 - 11.33 = 1.93

Thus the differences between School I and the other two schools are greater than the critical difference, indicating that the effects of the treatment condition were more pronounced in that setting.

Dunnett's analysis of Score Two of the Writing Speed Task yielded different results from that of Score One. (critical difference = 1.303):

School I vs II: 2.4 - 2.4 = 0

School I vs III: 2.4. - 4.133 = -1.733

School II vs III: 2.4. - 4.133 = -1.733

In this comparison the differences between School III and the other two schools exceed the critical difference and thus account for the significant F value.

Score Three of the Writing Speed Task indicated mixed

results (critical difference = .9425)

School I vs II: 3.015 - 2.148 = .867

School I vs III: 3.015 - 1.823 = 1.192

School II vs III: 2.148 - 1.823 = .325

The only significant difference in this case is that between School I and School III thus allowing no conclusion to be drawn.

A significant effect for schools also resulted from the analysis of the post-treatment grade point averages of the students that comprised the sample for the experiment. Dunnett's analysis of the grade point averages resulted in the following comparisons (critical difference = .3591):

School I vs II: 2.921 - 3.282 = .361

School I vs III: 2.921 - 3.018 = -.097

School II vs III: 3.282 - 3.018 = .264

Since only the comparison between School I and School II exceeded the critical difference, no conclusion can be drawn concerning the effects of the experimental conditions on grade point average.

Chapter Five

Summary, Conclusions, Limitations and Recommendations

Chapter Five presents a summary of this research study and interpretations of the results according to hypotheses. Limitations of the study which may have effected the results are discussed. Conclusions based on these interpretations are drawn, and implications and recommendations for further research are offered.

Summary

More and more frequently, it seems, one hears about an individual who dies of some form of coronary heart disease at a far younger age than is commonly considered "normal". In many cases these persons seem to have taken the logical precautions offered by the medical profession regarding the "traditional risk factors" discussed in Chapter Two. They seem to eat and drink moderately, do not smoke, exercise vigorously and frequently, and receive regular health examinations. Despite these often conscious efforts to maximize health, heart attack strikes. Scientists now realize more fully the contributions of psychological factors in general, and the Type A behavior pattern specifically, to the development of serious illnesses. The discovery of this behavior pattern even in young children can shed some light on the occurrence of heart disease in younger individuals. However, no valid explanation has been clearly demonstrated to indicate why this phenomenon seems to be increasingly more common. Indeed, little evidence exists to explain why some individuals seem to develop the destructive Type A

behavior pattern and others do not, or to delineate the method (s) of acquisitions. Clearly a great deal of research needs to be undertaken to address these issues.

It does not seem logical, however, for the psychological professions to remain idle while the solutions to the above questions are sought. On the contrary, it would seem that counselors and psychologists have a serious responsibility to attempt to assist in the discovery of methods individuals can utilize to alleviate the ill effects of the Type A pattern. Certainly that is of prime importance for those persons who have been identified as Type A and who have also suffered from myocardial infarction or some other aspect of Coronary Heart Disease. However, it is of equal import for those individuals who have been identified as possessing the Type A pattern, but who evidence no indication of heart disease. After all, prevention is the ultimate goal of all medical and medically related services, including mental health. It is for this purpose that this research was undertaken.

As described in Chapter Two, the Type A individual is one who is very concerned about achievement and about the importance of time and deadlines. Any educator who has worked with academically gifted students immediately recognizes them in this description. Since evidence also indicates that many Type A persons are found among the highly educated, it seemed logical to design an intervention strategy aimed at the population most likely to possess the Type A pattern at an early age. In fact over 50% of the high

achieving students who completed the Jenkins Activity Survey as part of this project were indeed identified as Type A.

Much of this research outlined in Chapter Two reviews some of the interventions attempted with Type A persons. While the success rate varies both between treatments and within an individual treatment, some combinations of cognitive therapy and behavioral therapy seemed most effective in the majority of cases. Thus the intervention of Cognitive Behavior Modification was chosen for this investigation because it combined the most effective elements of both cognitive and behavioral therapies. Since this project would also be utilizing a student population not previously involved in Type A research, it seemed important to select a treatment that had been demonstrated as helpful to students in other settings. The Stress Innoculation Training developed by Meichenbaum appeared to be most suited to both the problem and the population.

Honor Roll students from three Norfolk, Va. junior high schools completed the Jenkins Activity Survey. Students who were thus identified as Type A were randomly assigned to two treatment groups and a waiting list control group. Each treatment group participated in a five week program of Stress Innoculation Training (outlined in Appendix A). At the completion of the treatment period all students completed the Gough Adjective Check List to measure need for achievement, the Timed Arithmetic Task to measure achievement striving, and the Time Estimate Task and Writing Speed

Task to measure time urgency. In addition a post-treatment comparison was made of the third quarter grade point averages of the involved students.

This study utilized a post-test only control group design. Statistical analysis consisted of a three by three factorial design analysis of variance to measure for treatment effects, school effects and the interaction effects of school and treatment. Each null hypothesis was rejected at the .05 level of significance. The Dunnett's multiple comparison test was utilized to test for specific effects in those measures found to differ significantly.

Conclusions, Interpretations and Limitations

Interpretations of the results of the treatment, as well as conclusions that can be drawn from the results will be discussed in this section for each hypothesis tested.

Hypotheses One, Two and Three

These hypotheses dealt with the effects the experimental conditions would have on the achievement levels of the students participating. As noted above Type A individuals seem quite concerned that any attempts to change their behavior pattern will result in a lowering of their actual avhievement. Thus it was important that any positive effects of the treatment utilized in this research not be counterbalanced by a negative loss of achievement. No significant difference was found between the post-treatment grade point averages of the treatment groups or the control groups. Although a significant difference was found between the GPA's of the different schools, subsequent analysis using the Dunnett's method failed to yield a consistent pattern of difference. No significant interaction effect was found on this measure of achievement. It was thus concluded that the experimental conditions did not effect the achievement level of the Type A students.

Hypotheses Four, Five and Six

These hypotheses centered around the achievement striving dimension of the Type A individual. As discussed in Chapter Two, these persons are driven by an excessive level of achievement striving even on tasks that seem to be of little importance. The Timed Arithmetic Task was designed

to measure this aspect of the Type A personality. Thus if successful, the intervention should have resulted in lower scores on the Timed Arithmetic Task for those students who participated in treatment. However, no significant differences were found either between the treatment groups and the control groups or between the various schools involved in the experiment. No significant interaction effect was noted between schools and treatments. It thus appears that the intervention program was not effective in reducing excessive achievement striving in the Type A students who participated.

Hypothesis Seven

This hypothesis, together with hypotheses eight and nine, deals with the effects of the treatment on the Time Urgency dimension of the Type A behavior pattern. Since several tasks were utilized to measure this variable, each hypothesis will be treated individually in this section.

Hypothesis Seven sought to demonstrate that Stress Innoculation Training was effective in reducing the sense of time urgency in the students who participated in treatment as compared with the control students. Values of F for the Time Estimate Task failed to reach the level necessary to reject the null hypothesis at the .05 level. Thus one must conclude that there was no significant difference between the students in the treatment groups and the control groups on this measure of time urgency.

Score One of the Writing Speed Task, which is derived by subtracting the regular writing speed from the slow writ-

ing speed, is a measure of impatience as well as of speed. It has been consistently demonstrated that Type A individuals have difficulty slowing down on daily tasks. Thus a larger difference between regular and slow writing speed would indicate that a person is indeed able to slow down and thus is less Type A than one with a smaller difference. Analyses conducted on this score failed to yield an F value large enough to reject the null hypothesis. Thus students from the treatment groups were not significantly more able to slow down than those from the control groups, and we conclude that the intervention had no effect on this variable.

Score Two of the Writing Speed Task, which is derived by subtracting the fast writing speed from the regular writing speed, is used to measure how close the Type A individual's normal speed is to a rapid writing pattern. As previously indicated, Type A persons live most of their lives at a rapid, stressful pace. Thus a larger difference between regular speed and fast speed would indicate a reduction in the Type A pattern. Analyses conducted on this score failed to yield an F value that would indicate any significant difference between the treatment and control groups on this variable. Thus the intervention was not effective in slowing down the regular writing speed of the participants.

Score Three of the Writing Speed Task, which is derived by obtaining the ratio of the slow writing speed to the regular writing speed is a further delineation of the person's

ability to slow down on tasks. The analysis conducted on this score also failed to reach significance.

Since all four of the measures of time urgency failed to reach a level of significance that would allow the rejection of the null hypothesis, one concludes that no significant difference resulted between the treatment groups and the controls.

Hypothesis Eight

This hypothesis sought to determine that significant differences exist between the various schools that participated in the study. Values of F for the Time Estimate Task failed to reach significance at the .05 level, thus one must conclude that there is no significant difference between the various schools on this measure of time urgency.

The analysis of Score One of the Writing Speed Task reached an F value of 3.415 which, with degrees of freedom of 2 and 81, is sufficient to reject the null hypothesis at the .05 level. Thus a significant effect for schools was noted on this measure. Behaviorally this indicates that the individuals from one school were able to slow down after treatment much more than the students from at least one other school. The Dunnett's analysis conducted to isolate the source of variance indicated that the students from school one differed significantly from those of both other schools.

The analysis of Score Two of the Writing Speed Task reached an F value of 8.403 which, with 2 and 81 degrees of freedom, was large enough to reject the hypothesis at

the .001 level. Thus a very significant effect for schools was noted on this measure. This would indicate that the students from one school evidenced a regular writing speed far more moderate than the students from at least one other school. The Dunnett's analysis conducted to isolate the source of variance indicated that the students from school three differed significantly from those of both other schools.

The analysis of Score Three of the Writing Speed Task resulted in an F value of 3.191 which, with 2 and 81 degrees of freedom, was sufficient to reject the null hypothesis at the .05 level. Thus a significant effect for schools was noted on this measure. This would indicate that the students from one school evidenced a larger ratio between their regular writing speed and slow writing speed and (thus were more able to slow down) than the students from at least one other school. The Dunnett's analysis conducted to isolate the source of variance indicated that the students from school one differed significantly from those from school three, but not from school two. Nor did school two differ from school three. Thus no valid conclusion could be drawn from this measure.

Hypotheses Nine

This hypothesis sought to determine if any significant interaction between the treatment and the schools resulted from the experiment conducted. Values of F derived from the analysis of the Time Estimate Task failed to indicate any significant interaction effect on this measure of time

urgency.

The analysis of Score One of the Writing Speed Task resulted in an F value far below that required to reject the null hypothesis at the .05 level of significance. Thus no significant interaction effect was noted for this measure.

The analysis of Score Two of the Writing Speed Task resulted in an F value of .7675 with 4 and 81 degrees of freedom. This was not of sufficient size to allow for the rejection of the null hypothesis. Thus no significant interaction effect was noted for this measure.

The analysis of Score Three of the Writing Speed Task resulted in an F value below that required to reject the null hypothesis at the .05 level. Thus no significant interaction effect was noted for this measure.

Since none of the four measures of time urgency indicated any significant interaction between schools and treatments one must conclude that the experimental conditions resulted in no interaction effects.

The mixed results obtained from the above analyses allow for no broad, definitive conclusions to be drawn regarding the reduction of the time urgency dimension. While indeed school one students were able to slow down significantly more than schools two and three, and while school three students were able to obtain a significant difference in their regular-fast writing speed comparison, the lack of a consistent pattern in these results argues against any definitive conclusions. Thus one must state that no conclusive effect on the time urgency dimension

of the Type A behavior pattern resulted from the experimental conditions.

Hypotheses Ten, Eleven and Twelve

These hypotheses centered around the measured need for achievement exhibited by Type A individuals. The researchers who have attempted to modify the behavior pattern in past experiments have found resistance from individuals who felt they would be unable to function without this operational need. Indeed, no deleterious effects of a high need for achievement have been scientifically documented. It is rather the behavior pattern the individual develops in trying to meet this need that has proven harmful. Thus any treatment that seeks to alter the Type A pattern must demonstrate that it does not significantly diminish the participants fundamental need for achievement. The achievement scale of the Gough Adjective Check List was utilized to measure this aspect of the personality. No significant differences between the treatment groups and the control groups resulted from the analysis of this score, nor were any significant differences noted between the various schools. Analysis also failed to distinguish any significant interaction effects between the school and treatments. It thus appears that the treatment in no way effected the measured need for achievement in the participating students and the hypotheses are accepted as stated. However, since no significant effects were noted on the various dimensions of the Type A behavior pattern this conclusion is of little import.

Limitations

In addition to the limitations of counselor "style", time-limited treatment, and target population discussed in Chapter I, several other limitations surfaced in this investigation.

First of all the training period of two hours may indeed have proven far too short to enable the participating counselors to effectively deliver the prescribed treatment. Although as noted all participants had received some training beyond the master's degree and were all familiar with the parameters of both cognitive and behavioral therapy, a longer period of indoctrination coupled with direct practice would perhaps have proven beneficial. However, none of the counselors indicated any perceived inadequacy.

Secondly, since the only significant differences noted in the various analyses conducted were found between the three schools participating, one suspects that various population characteristics might account for these differences. Indeed socio-economic background, prior history of stress related illness, and level of intellectual ability are all variables that could indeed effect the outcomes of treatment.

A third limitation is the lack of strict classification of participants as Type A or Type B. While the Jenkins Activity Survey is considered quite valid for this purpose, no attempt was made to validate its results with other pre-treatment measures. Indeed, perhaps individuals should

have been classified as either extreme or moderate Type A prior to the intervention.

Finally the age of the subjects may indeed have contributed a further limitation. Individuals are far less serious about a program designed to alleviate a problem of which they have little direct experience. For the majority of junior high school students the possibility of severe stress related illness is far removed from their realm of activity.

Recommendations

In light of the results of this experiment and the limitations noted above the following recommendations are offered to future researchers:

1. Individuals should be classified as extreme Type A or moderate Type A prior to beginning any treatment.

2. Some attempt should be made to correlate the occurrence of the Type A behavior pattern with the IQ of the subjects involved in the study. Perhaps those individuals who are indeed highly gifted do not develop the Type A pattern as readily or to the same degree as high achievers with average ability.

3. A longer, more intensive counselor training program should be utilized to prepare those who are to deliver the treatment.

4. Various population parameters, such as prior illness history, of the subjects should be isolated prior to the beginning of treatment.

5. A longer treatment period should be utilized. Since the Type A pattern one is attempting to modify is developed over a long period of time, it may indeed be unrealistic to expect significant results from any brief program of therapy.

6. Although some research has been conducted into the personalities of the parents of Type A children, further study is needed in this area. Indeed, it would seem that much attention needs to be devoted to the method of acquisition of this pattern.

7. It has been reported that high achievers are also found among individuals classified as Type B. Efforts should be devoted to delineating specific differences between these persons and their Type A counterparts. The mere lack of Type A characteristics adds little to our understanding of the total phenomenon.

8. Future researchers would do well to employ some additional means of identification of Type A to supplement the Jenkins Activity Survey.

9. Future research must consider the possibility that the treatment is ineffective with a student population. A different treatment should be tested with students, and Stress Innoculation Training tested with an adult group of non-cardial Type A's.

10. Finally, valuable information could be gained by studying Type A students who are not high achievers. The mere existence of the Type A pattern does not in and of itself guarantee academic success.

APPENDIX A

Measurement Instruments: Jenkins Activity Survey, ACL, Timed Arithmetic Task Consent Form

Grade Level_____

Age_____

Sex_____

Consent Form

I give my permission for my son/daughter----------to participate in the counseling group described in the paragraph below.

---

parent signature

This counseling will consist of a five week program of stress innoculation training. Essentially this program is designed to help academically superior students deal with the psychological stress that accompanies prolonged academic efforts. The group is part of research being conducted by Mr. Robert J. Grant of the Norfolk Public Schools counseling department as part of his doctoral dissertation at the College of William and Mary. This research will be supervised by the faculty of the School of Education of the College and has their endorsement. It has also been approved by the research department of the Norfolk Public Schools system and by the principal of my child's school. I understand that the results of the study will be published in such a way as to assure the anonymity of all participants.

SIMPLIFY

1) 8 + 5 =	2) 9 x 7 =	3) 11 - 3 =	4) 63 ÷ 7 =	5) 13 - 6 =
6) 24 ÷ 8 =	7) 80 x 6 =	8) 6 + 9 =	9) 2 + 6 + 7=	10) 16 - 9 =
11) 13 - 8 =	12) 9 + 6 =	13) 28 ÷ 4 =	14) 9 x 3 =	15) 9 + 1 =
16) 5 + 9 =	17) 8 - 5 =	18) 8 x 5 =	19) 48 ÷ 6 =	20) 12 - 8 =
21) 13 - 7 =	22) 72 ÷ 9=	23) 8 ÷ 9 =	24) 18 - 9 =	25) 3 x 7 =
26) 12 - 5 =	27) 0 ÷ 8 =	28) 9 x 4 =	29) 54 ÷ 9 =	30) 15 - 7 =
31) 10 - 7 =	32) 32 ÷ 4=	33) 9 x 5 =	34) 7 + 9 =	35) 7 x 8 =
36) 4 + 6 =	37) 81 - 9=	38) 6 + 3 =	39) 0 x 7 =	40) 25 ÷ 5 =
41) 14 - 7 =	42) 16 ÷ 4=	43) 15 - 6 =	44) 5 + 4 =	45) 6 x 7 =
46) 9 x 8 =	47) 7 + 5 =	48) 2 - 2 =	49) 64 ÷ 8 =	50) 5 + 5 =
51) 27 ÷ 9 =	52) 9 + 3 =	53) 1 x 1 =	54) 9 - 0 =	55) 9 + 9 =
56) 6 x 8 =	57) 8 + 2 =	58) 3 x 0 =	59) 36 ÷ 6 =	60) 6 + 5 =
61) 9 x 6 =	62) 45 ÷ 5=	63) 16 - 9 =	64) 5 + 3 =	65) 21 ÷ 3 =
66) 4 + 4 =	67) 5 x 8 =	68) 18 ÷ 6 =	69) 14 - 9 =	70) 8 ÷ 2 =
71) 2 + 9 =	72) 8 x 8 =	73) 56 ÷ 7 =	74) 17 - 8 =	75) 0 + 0 =
76) 18 ÷ 2 =	77) 5 - 1 =	78) 3 + 8 =	79) 8 x 3 =	80) 12 - 3 =
81) 7 + 8 =	82) 20 ÷ 4=	83) 11 - 5 =	84) 2 + 6 =	85) 3 x 9 =
86) 81 - 9 =	87) 6 - 6 =	88) 8 + 8 =	89) 7 x 7 =	90) 72 ÷ 8 =
91) 6 + 1 =	92) 6 x 4 =	93) 21 - 3 =	94) 2 + 3 =	95) 10 - 3 =
96) 15 - 6 =	97) 28 - 4=	98) 16 - 9 =	99) 9 x 5 =	100) 7 + 5 =

101)4 + 9 + 6= 102)71 x 9= 103)37 - 8= 104)61 x 5= 105)8 + 7 + 6=

106)2 + 6 + 7= 107)53 - 2= 108)128 ÷ 2= 109)12 - 9= 110)90 x 7 =

111)62 x 3 = 112)44 - 7 = 113)588 ÷ 7= 114)30 x 6= 115)5 ÷ 5 =

116)8 + 4 + 7= 117)41 x 5 = 118)186 - 3= 119)24 - 8= 120)90 x 9 =

121)9 x 5 = 122)26 - 7 = 123)53 x 3 = 124)3+2+6 = 125)0 ÷ 7 =

126)30 x 7 = 127)6 x 6 = 128)49 ÷ 7 = 129)4+3+1= 130)35 ÷ 5=

131)79 x 1 = 132)35 - 6 = 133)9 + 7 = 134)24 ÷ 4= 135)4 x 4 =

136)455 ÷ 5 = 137)9 + 8 = 138)40 - 6= 139)18 - 6= 140)10 + 5 =

141)61 x 6 = 142)4+5+6 = 143)72 - 6 = 144)54 ÷ 6= 145)65 x 0 =

146)8 + 1 = 147)27 - 3= 148)2 + 2 = 149)42 - 5= 150)52 x 2=

151)2 x 6 = 152)42 - 6= 153)24 - 6= 154)53 x 0= 155)390 ÷ 6 =

156)3 + 3+ 3= 157)50 ÷ 5 = 158)1 x 3 = 159)16 ÷ 2= 160)4+4+4=

161)4 + 7 = 162)84 x 2 = 163)73 - 5= 164)244÷ 4= 165)1+1+1 =

166)17 - 8 = 167)6 + 6 = 168)40 x 3= 169)1+2+3= 170)38 - 9 =

171)80 x 4 = 172)43 - 4 = 173)355÷ 5= 174)5 + 5= 175)230 ÷ 5 =

176)50 x 2 = 177)144 ÷ 8= 178)53 - 7= 179)6 x 2= 180)5 = 6 =

181)3 + 9 = 182)48 - 2 = 183)20 x 4= 184)38 - 8= 185)50 x 5 =

186)4 + 8 = 187)9 - 6 = 188)5 x 8 = 189)48÷ 12= 190)9 + 9 =

191)40 x 5 = 192)0 ÷ 7 = 193)16÷ 8 = 194)7 + 7= 195)8 + 8 =

196)25 x 5 = 197)17 - 9 = 198)3 + 8 = 199)25 ÷ 5= 200)14 - 7 =

APPENDIX B

STRESS INNOCULATION TRAINING

SESSION ONE

Session purpose: get acquainted, present rationale of program, begin relaxation exercises, introduce notion of stress

Getting acquainted exercise

Present bkacground of stress, time demands, achievement motivation

Discuss connection between stress, tension and illness

Discuss participants' self-defined stress situations

Introduce notion of early signs of stress and use of relaxation and internal sentences to reduce stress.

Practice identifying feelings that preceed, accompany, or follow stress situations

Explain deep muscle relaxation, being practice tape

Homework: begin identifying feelings, thoughts, etc. that accompany stress situations during week; practice relaxation exercises 20 minutes per day; take notes on one in vivo stress situation.

SESSION TWO

Purpose: Review progress in identifying life stressors, learn to relax muscle groups, begin to relax without tension

I- Review homework

II-Reframe stress in terms of (a) feelings and (b) self-statements while under tension

III-Relaxation practice in muscle groups with and without tension

Homework: relaxation practice; breakdown stresses of week into preparation, confrontation, coping, reinforcement of success; keep notes for discussion

SESSION THREE

Purpose: Experience anxiety arousal, terminate it using relaxation, develop positive self-statements.

I- Discuss homework

II- Discuss negative self-statements

III- Have each client develop positive self-statements

IV- Practice: relaxation, visualization of tense setting, relaxation, visualization a second time using positive self statements

V- Discuss practice, problems, etc

VI- Homework- daily practice of key words to relax at first sign of tension; practice relaxation exercises; use positive self-statements keep notes on in vivo settings.

SESSION FOUR

Purpose: further practice in use of relaxation, key words, positive self-statements, being practice in alternate settings.

I- Discuss homework, elicit report from each participant

II- Group practice of full procedure of relaxation, tension, key words, self-statements

III- Discuss practice session, any problems remaining

IV- Emphasize need for application in daily stress settings

V- Homework: Continue relaxation practice, use self statements, reinforce successful efforts, keep notes on in vivo efforts.

SESSION FIVE

Purpose: review, final discussion, post test instruments and schedule

I- Discuss any settings in which process used successfully

II- Discuss any problems of individuals

III-Administer ACL and Timed Arithmetic Task

IV- Schedule individual behavioral tasks

V- Closing statements

APPENDIX C

TABLES OF MEANS

Table of Means

Post-Treatment Grade Point Average

Hypotheses One, Two and Three

			GROUPS		
			A	B	C
Schools	I	m	3.091	2.792	2.88
		sd	.511	.662	.504
	II	m	3.347	3.414	3.087
		sd	.467	.554	.708
	III	m	2.963	3.046	3.045
		sd	.565	.472	.416

Table of Means

Timed Arithmetic Task

Hypotheses Four, Five and Six

			GROUPS		
			A	B	C
Schools	I	m	94.4	78.4	93.3
		sd	15.728	19.823	21.386
	II	m	84.4	80.0	82.1
		sd	25.341	20.586	16.003
	III	m	82.7	89.3	89.1
		sd	16.707	26.928	26.13

Table of Means

Time Estimate Task

Hypotheses Seven, Eight and Nine

			GROUPS		
			A	B	C
Schools	I	m	37.2	33.2	33.9
		sd	14.733	13.75	14.798
	II	m	41.8	45.3	38.9
		sd	17.612	9.764	21.512
	III	m	41.6	37.4	44.6
		sd	10.222	15.974	17.443

Table of Means

Writing Speed Task-Score One

Hypotheses Seven, Eight and Nine

			GROUPS		
			A	B	C
Schools	I	m	16.0	32.7	20.3
		sd	15.783	45.54	12.833
	II	m	11.6	18.3	9.9
		sd	10.543	14.982	3.665
	III	m	11.0	12.4	10.6
		sd	7.601	9.902	7.501

Table of Means

Writing Speed Task-Score Two

Hypotheses Seven, Eight and Nine

			GROUPS		
			A	B	C
Schools	I	m	2.6	2.1	2.5
		sd	1.578	2.234	.972
	II	m	2.7	2.4	2.1
		sd	1.889	1.897	1.449
	III	m	3.4	4.5	4.5
		sd	1.174	3.24	1.581

Table of Means

Writing Speed Task-Score Three

Hypotheses Seven, Eight and Nine

			GROUPS		
			A	B	C
Schools	I	m	2.03	4.553	2.463
		sd	1.306	6.582	.924
	II	m	1.98	2.535	1.93
		sd	.779	1.222	.446
	III	m	1.896	1.878	1.695
		sd	.769	.78	.477

Table of Means

ACL Achievement Scale (T-scores)

Hypotheses Ten, Eleven and Twelve

			GROUPS		
			A	B	C
Schools	I	m	47.1	49.2	48.3
		sd	5.021	6.596	6.993
	II	m	50.1	48.4	47.9
		sd	4.932	9.348	6.064
	III	m	48.4	50.4	46.7
		sd	3.748	7.074	3.713

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ABSTRACT

THE EFFECTS OF COGNITIVE BEHAVIOR MODIFICATION ON TYPE A BEHAVIOR IN ACADEMICALLY SUPERIOR SECONDARY SCHOOL STUDENTS

GRANT, ROBERT JOHN, Ed.D.
THE COLLEGE OF WILLIAM AND MARY IN VIRGINIA, 1983

CHAIRMAN, DR. CHARLES O. MATTHEWS, II

The so-called Type A behavior pattern, which has been linked to a high incidence of heart attack among adult males, has been the subject of much research by both medical and psychological professionals. Although some recent efforts have focused attention on the existence of this pattern in children and adolescents, there have been few attempts to modify this damaging behavior pattern in individuals who have not manifested symptoms of coronary heart disease. This research is concerned with the student population deemed most likely to contain a high proportion of Type A individuals, namely the Academically Superior.

Honor roll students from three junior high schools completed the student form of the Jenkins Activity. The thirty students in each school who were identified as Type A were randomly assigned to one of two treatment groups or a waiting list control group. Each treatment group participated in a five week program of Stress Innoculation Training. This program consists of training in deep muscle relaxation, in the identification of stressful situations and the symptoms of stress, and the systemmatic modification of self-statements. Each group was led by one of the counselors regularly assigned to the participating school. Each counselor had received two hours of training in the implementation of Stress Innoculation Training. The course of the training followed a detailed outlined to optimize consistency.

Post-treatment measures included the Timed-Arithmetic Task to measure Achievement Striving, the Adjective Check List to measure need for achievement, the Writing Speed Task and the Time Estimate Task to measure Time Urgency, and the end of treatment grade point averages to measure actual achievement.

Using a 3 X 3 factorial design it was predicted that there would be no differences between treatment and control groups, or between the several schools involved in the experiment, on the measures of Time urgency, Achievement Striving, Need for Achievement or Achievement Level. In addition, it was predicted that there would be no significant interaction effect between the schools and treatments on these measures.

The two way analysis of variance conducted on the

post-treatment measures indicated that there were no significant differences on achievement level as a result of the experimental conditions, nor did any differences in achievement striving or need for achievement reach a level of significance that would allow the rejection of the null hypotheses. Although some significant school effects were noted on the reduction of Time Urgency, subsequent analyses failed to yield any consistent pattern of variance. It was thus concluded that the treatment was not effective in reducing the Type A behavior pattern in the subject population.