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An Investigation of the Effectiveness of  
Cognitive Behavior Modification in the Reduction of  
Test Anxiety

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Submitted in Partial Fulfillment of the Requirement

for the

Master of Arts

in

Clinical Psychology

Bogazici University Library



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1984

## Acknowledgements

I am greatly indebted to many persons who have helped me in various ways in writing this thesis.

I am particularly grateful to DoçDr. Güler Fişek without her help it would have been impossible to complete. I would further like to express my thanks to Dr. Gökçe Cansever and Doç.Dr. Hamit Fişek for their helpful suggestions and criticisms.

I would also like to thank the Counselor and the Dean of students of Robert College for their help in finding subjects and letting me conduct my study in their school.

## A B S T R A C T

The present study aimed to investigate the effectiveness of Cognitive Behavior Modification in reducing the test anxiety of twenty (8 male, 12 female) Robert College lycee three students. To asses the level of test anxiety of subjects in pre and post testing, STAI and TAS were used as instruments. The treatment was applied to the subjects in the experimental group while it was withheld from the control group. The hypothesis put forward was that, the decrease of test anxiety in the experimental group on STAI and TAS would be significantly greater than that in the control group. With the application of t-tests the results were found not to support this hypothesis. Various speculations as to the reasons for these findings were discussed and suggestions for further studies were given.

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The purpose of this study was to examine the effectiveness of cognitive behavior modification in reducing the test anxiety of high school seniors. Cognitive behavior modification is a newly developed but highly effective method in reducing anxiety, especially test anxiety (Allen, 1980). The inclusion of both behavioristic principles and cognitive elements has made this method a promising one in the field of clinical psychology. That is why the cognitive behavior modification was chosen in this study for the reduction of high school seniors' test anxiety.

The underlying reasons for selecting test anxiety as the subject matter of this study can be explained as follows: The importance placed upon tests in the Turkish educational system is well known. Final evaluations are made on the basis of students' success on tests; also admission to secondary education institutions teaching in foreign languages and to universities is solely determined by the scores of students on entrance exams. This creates great anxiety on the part of students. Even though a student is thoroughly prepared, he performs below his potential on a given test because the testing situation itself becomes a source of stress. It was thought that a study dealing with the reduction of test anxiety could help students to improve their success on examinations. The other reason is related to practicality of a research program. One common difficulty that is faced in conducting a study is finding subjects. It was thought that test anxiety is a wide spread problem among Turkish students, so it was hoped that no such problem as finding subjects would occur in this study.

When anxiety is evoked in evaluative conditions, it is named test anxiety; so for a better understanding of that specific kind of anxiety, the investigation of the concept of anxiety in general is needed. In the following section the conceptualization of anxiety in terms of two main schools of psychology i.e. Freudian and behavioristic will be given, after that the development of test anxiety theory and its relation to State-Trait Anxiety theory will be explained; then the instruments used to measure anxiety and the method employed to decrease test anxiety in this study will be presented; finally the aim of this study and the hypothesis will be introduced.

#### THE CONCEPTUALIZATION OF ANXIETY

All major theories of personality and behavior deals with anxiety in some way, for example the physiological theory of W.Cannon or dynamic theory of Freud and the ego psychologists, the existentialistic theories of May and Boss, and the theories of the behavioristic school, all discuss anxiety. In this study only two of them, psychodynamic and behavioristic theories will be briefly explained. The reason for including the behavioristic conceptualization of anxiety is obvious since this study is based on this approach. The psychodynamic explanation of the concept of anxiety is also presented because anxiety is the basic concept out of which the whole Freudian theory developed; therefore the concept has been deeply investigated within the framework of this approach.

### Psychodynamic Conceptualization:

The first investigations of anxiety had been carried out in the field of philosophy and theology by Pascal and Kierkegaard. It was Freud who analyzed the concept of anxiety within the framework of psychology. In psychoanalytic theory, anxiety can be defined as "an organismic response to perceived danger" (Sarason 1972). Freud's chief interest was the identification of the sources of anxiety (Spielberger, 1966, p.9). Considering the sources out of which anxiety was evoked, he recognized three types of anxiety, objective, neurotic and moral (Hall and Lindzey, 1978, p.47). The anxiety, evoked in response to danger coming from the external world is named as objective or reality anxiety. Neurotic anxiety is a reaction to danger not coming from the outer world, but from within a person in the form of instinctual energy; the protective barriers of the ego are threatened by such excessive instinctual energy emerging from the id. The sources of moral anxiety too are found in the person, but in the form of super-ego forces, not id impulses; so moral anxiety is the fear of the conscience. A more detailed explanation of each kind of anxiety will make the picture clearer.

Objective anxiety is a rational and natural phenomenon. When an organism expects an external danger or injury, it reacts to that condition with reality anxiety which is connected with the reflex of flight. Freud claimed that this kind of anxiety could be regarded as an expression of the instinct of self-preservation (Freud, 1953). In the deeper analysis of objective anxiety, he identified two elements, anxious readiness and the

development of anxiety. Freud (1920) claimed that the expedient one was the former and called the latter inexpedient. Anxious readiness helps the organism to perceive the danger, react to it immediately, but when the development of anxiety is more than a mere signal of danger, it paralyzes every action; so Freud said "the frightened animal is afraid and flees but the expedient element in this is the flight, not the being afraid" (Freud, 1920, p.402).

While objective anxiety is a reaction to external danger, it is abnormally utilized libido, i.e., instinctual energy which evokes neurotic anxiety. When instinctual energy is diverted from its natural form of utilization, the mechanism of repression is employed, in order to keep such undischarged energy under the control of the ego. But if repressed material is more than the ego's tolerance level, it begins to threaten the protective walls of the ego, and this is the point where neurotic anxiety begins. Neurotic anxiety is the fear that the instincts will be freed from the control of the ego and cause the person to exhibit unacceptable behavior (Hall and Lindzey, 1978, p.47). Freud referred to anxiety as a signal showing approaching danger, an indicator warning that something is not going well in the life of the individual. The neurotic is thus a person who attempts knowingly or unknowingly to neutralize this signal without taking realistic steps to eliminate the real cause which it represents. "He is like a person who let us say mans an anti-aircraft gun and aims it at the siren rather than approaching enemy" said Mowrer(1950, p.536).

Individuals having a harsh super-ego are inclined to experience intense guilt feelings when they do something or even think of doing something that opposes the moral norms of the society they have been brought up in. So the concept of moral anxiety has many common points with Mowrer's (1950) guilt theory of anxiety in which he claimed that anxiety comes from acts that an individual has committed but wishes that he had not.

#### Behavioristic Conceptualization :

The other major school of psychology views anxiety as a learned behavior that is composed of different types of reactions, cognitive, behavioral and affective. People acquire anxiety merely because they have undergone a traumatic experience. Once they suffer intense anxiety in a certain situation, they will try to avoid similar situations including totally neutral stimuli that happened to have been present at that time and acquired anxiety eliciting potential by association with the original anxiety evoking stimulus (Craighead, Kazdin and Mahoney, 1976). A brief presentation of the development of the concept of anxiety within behavioristic theory will be helpful here.

Mowrer (1950) defined anxiety as a learned response occurring to signals (conditioned stimuli) which have been followed in the past by situations of injury or pain (unconditioned stimuli). So according to this definition, anxiety has a life sustaining function, preparing the organism to deal with approaching danger. Behaviorists did not make the distinction between fear and anxiety as does psychoanalytic view, but recognized that

anxiety could occur in situations where there is no real existing danger and they called it unadaptive anxiety. This phenomenon is explained by the process of generalization which refers to the transfer of learning in one situation to another. More exactly, "reinforcement for making a specific response to a given pattern of cues strengthens not only the tendency for that pattern of cues to elicit that response, but also the tendency for other similar patterns of cues to elicit the response" (Sahakian, 1976, p.173). The kind of generalization discussed here is stimulus generalization, i.e. a response is performed to new stimuli similar to the original stimulus for which reinforcement occurs (Kazdin, 1980, p.48).

As it can be understood from above the initial behavioristic explanations of anxiety were based strictly on stimulus-response theory; any intervening variable between stimulus and response was being overlooked. Later in the early 1960's some theoryicians opposed strict-behavioristic theory on the grounds that it overemphasized the importance of environmental events (stimulus-response and reinforcement) and nearly ignored how a client perceived and evaluated those events. Clients' subjective evaluation began to be inserted between stimulus and response and as a result there were slight changes in the conceptualization of anxiety. Anxiety, said Bernstein (in Creaghead et.al.1976,p.184) "refers to a complex and variable pattern of behavior which occurs in response to internally (cognitively) or externally (environmentally) produced stimuli". Thus the importance of cognition come to be recognized as a factor in producing anxiety. Bāndura

claimed that "perceived threat activates defensive behavior because of its predicted value rather than their aversive quality". (in press 36 in Gambrill 1977). As it was indicated in the beginning of this section that through repeated occurrence (conditioning history) events acquire capacity to elicit anxiety. Meichenbaum (1975) stresses that an important part of this history concerns self-statements that are learned in relation to various situations perhaps through modeling. The manner in which a person thinks about given events is often related to the anxiety he experiences. The danger is often in the client's mind, in the form of anticipated unpleasant consequences and negative evaluations. Clients who complain of anxiety in a particular situation have an internal dialog which is different from that of a person who does not complain of anxiety in that situation (Meichenbaum in Gambrill, 1977, pp.113-114).

Having looked at the conceptualization of anxiety in general from two main perspectives, we will now focus on the specific type of anxiety which is the concern of this paper, namely, test anxiety.

#### Development of Test Anxiety Theories:

The pioneering research on the negative consequences of stress created by academic examinations was started in the early years of this century by Walter Cannon and Alexander Luria. Walter Cannon discovered (in 1929) that metabolic changes induced by stress, associated with academic examinations, lead to secretion

of sugar into the blood-stream. When the system could not absorb the excess sugar, it is passed on to the urine (in Speilberger, Ganzalez and Flether, 1979). On the basis of similar findings in other investigations, Cannon concluded that academic examinations provided an ideal situation to investigate the influence of real life stress on physiological changes. Alexander Luria (1932) was the first to draw attention to individual differences in test anxiety. He divided students into two classes as unstable and stable. Those students who displayed speech and motor disturbances and become excited and disorganized before and during examinations were called unstable. As opposed to this group, students who remained relatively calm and showed well coordinated speech and motor reactions were called stable. After comparing the two classes of students, Luria concluded that unstable students experienced heightened emotional reactions in academic examinations because the situation seemed to produce uncontrollable stress (Speilberger, Gonzalez and Fletcher, 1979).

The first systematic investigations of test anxiety were conducted by Charles H. Brown (1938) as a result of two students' suicides at the University of Chicago which were assumed to be due to examination stress (in Allen, 1980). Brown developed the first scale to identify test anxious students. He noted that questions dealing with subjective feelings of nervousness, irritability and worry about examinations were most highly correlated with high scores on his scale. As a result of his investigations, Brown concluded that "students who become excited before examinations tend, on the whole, to do a little poorer in examinations than those students who are calm before examinations" (in Speilberger, Gonzales and Flether, 1979).

Mandler and S.Sarason (1952) formulated the first detailed theory explaining how anxiety in examination situations influences performance. They found that high test anxious college students performed poorer than low test anxious students on intelligence tests. High test anxious students' performance was the worst when the tests were administered under stressful, ego threatening conditions (Speilberger, Anton and Bedel, 1976).

Mandler and S.Sarason (1952) looking at these phenomena from the gullian view point, claimed that the examination situation comes to be connected with two types of learned drives (Allen, 1980). The first type of drives are called learned task drives which are aroused by the demand characteristics of the task and reduced by the completion of the task, i.e.drives which stimulate task relevant responses. The second type of drives elicited in test situations are called learned anxiety drives. Two types of responses are produced by the latter; task-facilitating or task-interfering. It was assumed that task-facilitating responses which were mediated by anxiety were the same as learned task drives, since both aimed at the completion of a task. In contrast task-interfering responses aroused by learned anxiety drives avoid the completion of a task and cause performance decrements in the testing condition. This class of responses which interfere with performance in examination-conditions includes feelings of inadequacy, helplessness, hightened somatic reactions, anticipation of punishment or loss of status and esteem and implicit attempts at leaving the test situation (Mandler and Sarason, 1952, in Allen, 1980, pp83).

S. Sarason and Mandler (1952) claimed that stressful evaluative conditions will have differential effects on the performance of subjects who are high and low in test anxiety. The focus of attention in their theory was on the anxiety mediated task-irrelevant responses, which cause the reduction of test performance. It was claimed that such responses would be produced by high test anxious subjects. A questionnaire (called the Test Anxiety Questionnaire TAQ) was developed by Mandler and S. Sarason (1952) to assess individual differences in the tendency to emit such responses when confronted with a stressful examination situation. Mandler and Sarason proposed that positive correlations should exist between high scores on TAQ on the one hand and the degree of emotional arousal and magnitude of task-irrelevant responses on the other. Examination situations were thought to arouse a high level of anxiety drive in both high and low test anxious subjects. Subjects with high anxiety would feel the physiological arousal as disturbing, having been conditioned to emit task irrelevant responses such as feelings of inadequacy, helplessness etc. in such situations. The anxiety drive would help to motivate subjects with low test anxiety to emit task--relevant responses leading to completion of a task. This was the central hypothesis proposed by Mandler and Sarason. The high test anxious subjects would respond to the stressful test condition with performance decrements while the situation was performance motivating for low test anxious subjects. When none of the drives were activated the performances of high and low test anxious subjects should be the same.

To test these hypotheses they conducted some studies in which they manipulated stress, in testing situations, through employing various types of ego involving instructions. They reported that high evaluative stress conditions interfere with the performance of high test anxious subjects in contrast to low test anxious subjects. When the stress was minimized the performance of high test anxious subjects was relatively better than that of low task anxious subjects (Spielberger, Anton and Bedel, 1976). The results were consistent with the theory. In this mechanistic drive theory a central position was given to physiological activation.

This theory later began to be revised by other investigators, and the centrality of emotional reactivity left its place to more cognitive explanations. I. Sarason (1958) was the first to revise the learned drive explanation of test anxiety. In his research where achievement aspects of performance were emphasized, high test anxious subjects performed more poorly than those who were low on test anxiety. I. Sarason and Ganzer (1963) observed that in normal conversational situations high test anxious subjects made significantly more negative self references than low test anxious persons so they claimed that high test anxious subjects are more self centered and self critical than low test anxious subjects, they have a tendency to emit personalized, self centered, derogatory responses that interfere with task performance. As a result I. Sarason (1958) conceptualized test anxiety as a habitual inclination to being self critical, self preoccupied and self derogatory, particularly under

evaluative conditions. Within this reconceptualization there was an underlying attempt to enlarge the scope to include cognitive disruptions as damaging effects of test anxiety (Allen, 1980).

In 1967 Liebert and Morris put forward a more complex theory of test anxiety which had two essential components: worry and emotionality. The worry component was described as a primary cognitive concern about the consequences of failure. The emotionality component referred to the perception of unpleasant autonomic arousal in response to a stressful testing situation (in Allen, 1980, p.84). They claimed that it is worry rather than emotionality that interferes with performance, causes decrements on intellectual and cognitive tasks. More clearly the worry component diverts attention away from the task and results in performance decrements in evaluative situations (Meichenbaum and Cameron, 1974). Although with Liebert and Morris, the emphasis on cognitive factors increased, Wine (1971) was the first investigator who proposed an explanation of test anxiety explicitly stressing attention. Wine suggested that high test anxious subjects divide their attention between the demand characteristics of a task and task-irrelevant cognitive activities such as worry and self derogatory thoughts; thus they cannot direct adequate attention to task relevant variables. I. Sarason (1972) following the same line of thinking claimed that "whereas the less test anxious person throws himself into a task when he thinks he is being evaluated, the high test anxious person throws himself inward. He either neglects or misinterprets informational cues that may be readily available to him,

or experiences attentional block" (in Spielberger, Anton and Bedel, 1976, p.321). With the increasing importance of the worry component of test anxiety, intervention strategies began to shift to self control and cognitive behavior modification from emotional control and counterconditioning. Allen (1980) claimed that it was an empirical fact that high anxious people were more self preoccupied than low anxious people and that this pre-occupation weakens their coping ability.

A somewhat different explanation of the nature of test anxiety came from Maichenbaum and Butler (in press) who viewed test anxiety as involving self sustaining feedback loops between a person's core cognitive structures, internal dialogue, behavioral acts and the interpretation of the consequences of such acts. They claimed that helplessness and inadequacy were the two main elements of the high test anxious person's rigid belief system. Even the experience of a small amount of emotional arousal was continuously felt as anxiety or distress, the effect of which was exaggerated in the following internal dialogue. A stereotypic response coming out of the internal dialogue consists of avoidance which has consequences that are felt to be undesirable. Through this sequence the initial emotional arousal is magnified causing further validation of the major elements of the belief system (in Allen, 1980).

Recently Wine (in press) gathering information from diverse sources, offered a bidirectional model of cognitive attention the goal of which was to integrate a description of the properties of high and low test anxious individuals. Low test

anxious individuals. Low test anxious people have two important characteristics, first a powerful belief in self efficiency, second possessing behaviorally focused, situationally specific and problem oriented cognitions. Those people tend to interpret emotional arousal as energizing rather than distressing, to be task oriented actors not mere task avoidant observers (in Allen, 1980).

#### STATE-TRAIT ANXIETY THEORY AND ITS RELATION TO TEST ANXIETY

Although the cognitive explanation of test anxiety was pervading the theoretical realm, C.D. Spielberger, the founder of the state-trait anxiety theory placed primary emphasis on drives and emotions in explaining test anxiety.

The roots of the state-trait anxiety theory can be traced back to Cattell and Scheier (1961) who proposed a conceptual distinction between anxiety as a transitory emotional state and anxiety as a relatively stable personality trait. Spielberger defined the concept of state-trait anxiety as follows: "state anxiety may be conceptualized as a transitory emotional state or condition of the human organism that varies in intensity and fluctuates over time. This condition is characterised by subjective, consciously perceived feelings of tension and apprehension and activation of the autonomic nervous system. Trait anxiety refers to relatively stable individual differences in anxiety proneness, that is to differences in the disposition to perceive a wide range of stimulus situations as dangerous or

threatening and in the tendency to respond to such threats with state anxiety reactions" (1972, p.59).

This theory touches upon two critical points. One is the emphasis on affective as well as cognitive processes which characterize anxiety states as emotional reactions to stress. The other is the specification of the characteristics of the stimulus situations to which individuals differing in trait anxiety react with different levels of state anxiety. After conducting several investigations it was found that individuals having high trait anxiety tended to perceive the conditions in which personal efficiency was evaluated as more threatening than those individuals having low trait anxiety. In other words, psychological stresses that produce threat to self esteem (ego threats) evoke higher levels of state anxiety in high trait anxious individuals than in persons having low trait anxiety (Speilberger, Anton, and Bedel, 1976). The studies also showed that not all stress conditions evoke differential state anxiety reactions in persons who differ in trait anxiety. Threats of physical danger produce elevations in state anxiety but the magnitude of increase is similar for high and low trait anxious persons (Hodges and Speilberger, 1966; Katkin, 1965; Lamb, 1972 in Speilberger, Anton and Bedel, 1976). Both state-trait anxiety theory and test anxiety theories share the same view, that the stressful conditions, in which individuals differing in trait anxiety show different state anxiety reactions, are similar to the examination conditions that differentially affect the performance of persons having different levels of test anxiety. However the theories diverge in the relative amount of importance given to the worry and emotion-

Being more cognitive oriented, test anxiety theory stresses the worry component which is composed of self centered derogatory reactions and feelings of inadequacy and helplessness. Although test anxiety theory accepts that emotional arousal (state anxiety) takes place in evaluative conditions, the theory's explanation of performance decrement is mainly based on the worry rather than the emotionality component. The state-trait anxiety theory however places importance on the emotionality component which claims that an individual high in trait anxiety responds to stressful examination conditions with heightened state anxiety reactions. State-trait anxiety theory attempts to explain the performance decrements of test anxious persons with the activation of strong error tendencies by the high drive levels that are associated with an elevation in state anxiety (Speilberger, Anton and Bedel, 1976).

Within the framework of state-trait anxiety theory, Speilberger (1972) conceptualized test anxiety as a situation specific form of trait anxiety. This conceptualization suggests that under stressful test situations, high test anxious individuals show higher elevations in state anxiety than low test anxious individuals. Heightened state anxiety reactions, in test situations are equivalent to Liebert and Morris' emotionality component of test anxiety. As far as the worry component is concerned, Speilberger (1972) claims that self-centered derogatory responses of high test anxious individuals are triggered by state anxiety reactions aroused in those persons in evaluative situations. Speilberger, Anton and Bedel (1976)

advise that in dealing with the issue of test anxiety, both the worry that characterize test anxious persons and the emotionality that such persons experience in the testing situation should be taken into consideration.

Speilberger, Anton and Bedel conclude their theoretical analysis, conceptualizing test anxiety as a situation specific personality trait. They view trait test anxiety as reflecting individual differences in the tendency to perceive evaluative situations as threatening. High test anxious individuals respond to stressful evaluative conditions with increases in state anxiety levels and task irrelevant, self centered, distracting worry. Both components, worry and emotionality cause decrements in performance. In summary Speilberger, Anton and Bedel (1976) claim that trait test anxious individuals react to examination conditions with elevation in anxiety states. These states in turn motivate task-irrelevant worry responses that interfere with effective task performance, and task related error tendencies which compete with accurate responses.

#### MEASUREMENT OF TEST ANXIETY

In this section first, instruments employed in general to assess the level of test anxiety will be presented, secondly the specific instruments used in this study to measure test anxiety will be discussed at length. Allen (1980) divided the available instruments for measuring test anxiety into three groups on the basis of the information gathering channels. Thus he classified these instruments as, self report measures,

measures of physiological activation and observable performance measures.

1- Self Report Measures. These measures which provide the most direct access to evaluating subject's behaviors, cognitions, and feelings generated by test situations include a variety of test anxiety questionnaires such as: the Test Anxiety Questionnaire or TAQ (Mandler and S.Sarason, 1952), The Test Anxiety Scale or TAS (I.G.Sarason, 1958); the Achievement Anxiety Test or AAT (Alpert and Haber, 1960); the Suin Test Anxiety Behavioral Scale or STABS (Suin, 1969); the Worry Emotionality Questionnaire or WEQ (Liebert and Morris, 1967); the State-Trait Anxiety Inventory or STAI (Speilberger, Gorsuch and Lushere, 1970); and the Test Anxiety Inventory or TAI (Speilberger, 1978).

2- Measures of Physiological Activation. The information obtained through this channel is about the level of autonomic arousal, i.e. the emotionality component of test anxiety (experienced in the evaluative conditions). Two measurement instruments were included in this category: Pulse rate (PR) and finger sweat print (FSP) developed by Droppleman and Mc Nair (1968, 1971).

3- Observable Performance Measures. This method of assessing test anxiety was divided into two classes: semester grade point average (GPA) and direct observation of behavioral manifestations of anxiety. Although some investigators used GPA as a direct indicator of the level of test anxiety, P.Gonzalez (1976) claimed that in order to use GPA as an instrument to assess

the effectiveness of test anxiety reduction techniques. Subjects' study habits should be equal. He inserted study habits as an intervening variable between GPA and test-anxiety.

Direct observation of behavioral manifestations of anxiety was used as a technique by Mandler and Sarason (1952) to assess the level of test anxiety, in order to establish the face validity of TAQ.

In this study two of the instruments mentioned above were employed for the assessment of subjects' test anxiety levels.

#### The State Trait Anxiety Inventory (STAI)

STAI is made of two sub-scales, Anxiety-trait (A-trait) and Anxiety-state (A-state). Each scale has twenty Likert type items. Subjects respond to the Anxiety-state scale indicating how they feel right this moment with reference to a given item, through the use of a four point rating scale. STAI Anxiety-trait scale is responded to by subjects indicating how they generally feel. The procedure of rating the items is the same as the Anxiety-state.

It has been demonstrated that while STAI Anxiety-state was responsive to such changes as increase in stress or relaxation training, these phenomena were not observed for STAI Anxiety-trait which appeared to assess less changeable individual differences in anxiety proneness (Zuckerman and Spielberger, 1976). The reliability and validity of STAI for English-speaking

American samples were found to be high. STAI was translated into twenty-six different languages (Speilberger and Sharma, 1976). The Turkish form of STAI-T) was standardized by Öner and Le Compte (1976). Studies on the validity and reliability of STAI-T on a sample of 226 bilingual high school boys and girls gave satisfactory results. After several investigations STAI-T appeared to discriminate high and low test anxious subjects successfully in Turkish samples used such as Robert College 9th grade students (Zülemyan, 1979).

#### The Test Anxiety Scale (TAS)

Mandler and S.Sarason (1952) developed a 37-item graphic rating scale or TAQ for the assessment of the reaction of subjects in evaluative situations. Selecting some questions out of the TAQ, I.Sarason (1958) developed a 21-item Test Anxiety Scale (TAS) which proved to be valid, having a correlation of  $r = .93$  with the TAQ (Sarason, Pederson and Nyman, 1968).

After investigations of the internal consistency of the 21-item TAS, I.Sarason decided to develop an enlarged form which contained 37-true false items. This expanded revision showed a correlation of  $r = .93$  with the older form; and appeared to have a reliability coefficient of  $r = .80$  (Sarason, 1978).

A factor analysis revealed that the 37-item TAS aims at the exploration of two elements, one being interfering thoughts, the other being unpleasant emotional arousal, under evaluative conditions. The expanded form of TAS was employed in a Turkish sample and proved to be effective in discriminating high

and low test anxious subjects (Zülemyan, 1979). However Speilberger (1977) criticized it for lacking norms and systematic presentation of its correlates.

#### TREATMENT OF TEST ANXIETY

Studies dealing with the reduction of test anxiety can be classified into two groups, application-oriented treatment and theory building (G.Allen, 1980). The first group includes those studies which aim to investigate the effectiveness of a specific treatment strategy. The second group consists of those investigations which intend to analyse the nature of test anxiety. This study falls into the first group. The effectiveness of the Cognitive Behavior Modification method in reducing test anxiety is examined. Before presenting how the Cognitive Behavior Modification (CBM) method deals with the reduction of test anxiety, the basic principles on which this approach is based will be explained.

The CBM technique is similar to systematic-desensitization except for the inclusion of explicit cognitive elements which are inserted into the classical desensitization method at two points. These are, challenging the clients' faulty belief structure and the employment of coping imagery instead of mastery imagery. The systematic desensitization is one among many techniques of behavior therapy which emerged with the employment of experimentally based learning principles in the field of clinical psychology. Using the rules of learning,

Behavior therapy aims to weaken or eliminate maladaptive habits i.e. stimulus-response chains, and establish adaptive ones. The most commonly used behavior therapy technique is reciprocal inhibition (desensitization). Although this technique was perfected by Wolpe (1958), the underlying rules had emerged in the early years of the 20th century. Sherrington (1906) noted that reflex ~~excitation~~ of a particular group of muscles automatically involved the inhibition of an antagonistic group and vice versa. Later with Pavlov's experiments the phenomenon of conditioned inhibition became more obvious. In his famous experiment (1927) initially the bell evoked listening movements but, after repeated pairing of the bell with food, the dog came to respond to it by salivating and turning toward the food pan and listening response gradually faded. In other words the listening habits had undergone conditioned inhibition (Wolpe, 1976, p.13). At about the same time (1924) similar developments were taking place in the U.S. Mary Cover James had overcome a child's phobia by repeatedly presenting, and gradually bringing the feared object nearer to the child when he was hungry and about to eat. In 1935 the importance of counter-conditioning as a therapeutic tool was emphasized by Guthrie who claimed that "the simplest rule for breaking a habit is to find the cues that initiate the action and find another response to these cues" (in Wolpe, 1973, p.5).

Towards the end of the 1940's Wolpe, after having produced experimental neurosis in cats by administering to them high-voltage, low amperage shocks in a small cage, he tried to

overcome such neurotic anxiety responses. He found that this specific behavior was extremely resistant to extinction. The cats even refused to eat in the cage where they had undergone the process of experimental neurosis which had caused the inhibition of such a basic adoptive response as eating. With the finding that the cats' anxiety was reduced in a place that resembled the conditioned situation less, Wolpe set out to find a room in which the arousal of anxiety was weaker than the drive of the animal to eat, and therefore did not inhibit the eating. The repeated presentation of the food in this room caused the anxiety responses to disappear. In this way Wolpe, overcoming the neurotic anxiety of the cats in that room, advanced to another room which resembled the initial conditioning environment more. Increasing the resemblance each time, in the end Wolpe got the cats to eat in the original room. He concluded that human neurotic habits might also be broken down step by step. But eating was not an effective inhibitor of neurotic anxiety for human subjects. As a solution to this problem, Wolpe introduced Edmund Jacobson's (1938) Progressive Relaxation technique, because "the autonomic effects that accompany deep relaxation are diametrically opposed to the characteristics of anxiety" (Wolpe, 1973, p.98). As it had happened in the case of the cats, the autonomic effects of relaxation were able to inhibit only weak anxiety responses. Through such developments in the theory and practice of reciprocal inhibition, the most well known technique of behavior therapy in the clinical realm emerged, namely systematic desensitization. Wolpe defined it as follows "it is one method

for breaking down neurotic anxiety response habits in piece meal fashion; a physiological state inhibitory of anxiety is induced in the patient by means of muscle relaxation and he is then exposed to a weak anxiety arousing stimulus for few seconds. If the exposure is repeated for several times, the stimulus progressively loses its ability to evoke anxiety. Then successively stronger stimuli are introduced and similarly treated." (1973, p.95).

There was still a problem to overcome. Conditioning theory claims that to inhibit a habit of reaction to a stimulus, that stimulus must be present in the deconditioning situation. However, with human subjects it was not possible to present the original stimulus during the reciprocal inhibition process. The presentation of the original stimulus by way of imagination (invitro) instead of in actuality (invivo) was the most important contribution of Wolpe to the technique of reciprocal inhibition. After this last refinement, the process of systematic desensitization was as follows:

To begin with, subjects were trained in deep muscle relaxation with the instructions given by the therapist. Through this process a physiological state counter to anxiety was aimed to be induced in clients. Secondly the situations in which the anxiety was felt by the client were identified and put into a hierarchy according to their anxiety evoking potential, so that the top item produced the highest and the bottom, the lowest level of anxiety in the client. In the last stage the subject was induced into a relaxed state and the least anxiety evoking situa-

tion from the hierarchy was asked to be imagined as vividly as possible. If the subject could imagine that scene without feeling anxious, the next, more anxiety arousing situation from the hierarchy was introduced. If the subject signaled anxiety while imagining the first situation, then he was instructed to terminate the imagination and relaxed again. The same procedure was employed over and over until that scene was imagined with no anxiety. The therapy was terminated when the most anxiety arousing scene was imagined without any anxiety. The successful reduction of anxiety with the use of the systematic desensitization technique has been reported by many investigators (Wolpe and Anton, 1975).

#### Cognitive Behavior Modification:

Towards the end of 1950's when behavioristic interventions were gaining increasing acceptance in clinical psychology, a new way of treating problematic behavior, combining cognitive semantic therapy logic with the technique of behavior therapy, began to emerge, namely cognitive behavior modification (Meichenbaum and Cameron, 1980).

Cognitive Behavior Modification therapists objected to the notions of connection and environmental determinism as presented by strict behaviorists. The human organism was no longer viewed as a passive product of environmental influence but rather an active participant in his own complex development. These therapists accepted reciprocal determinism which emphasized complex and continuous causal interaction between the organism and its environment. (Meichenbaum, 1978).

By that time learning and behavior therapists leaving their strict stimulus-response theory, had begun to place some importance on cognitions. For example Skinner (1953) claimed that cue-producing responses which were the labels (cognitive processes) used by persons in situations, could facilitate or inhibit the subsequent responses. Dollard and Miller (1950) suggested that, the labels (cognitive processes) that were used by clients were learned and could be employed for behavior-change. So, behavioral techniques which were used to change overt behavior were employed to modify cognitive (covert) processes. Homme (1965) introduced the concept of coverants (covert operants) to describe covert behavior within a behavioristic framework. As the concept cognition started to be the focus of attention, the rules of learning theory which were the basis for behavior therapy, began to be criticized; especially concepts such as the automaticity of reinforcement and the continuity assumption between covert and overt events (Meichenbaum, 1978). The phenomenon of conditioning was seen from a different angle. Elicitation of a conditioned response by a conditioned stimulus was not seen as the result of the establishment of an association, but it was seen as the consequence of the expected significance of the conditioned stimulus as a sign for the coming unconditioned stimulus (Maltzman, 1977). Bandura putting these words in another way, claimed that "conditioned reactions are largely self activated on the basis of learned expectations rather than automatically evoked. The critical factor therefore is not that events occur together in time, but that people learn to predict them"

(1974, p.860). Thus cognitive behavior modification therapists criticized behavior therapy techniques for overemphasizing the importance of environmental events (positive and negative reinforcements) and overlooking clients' cognitive structures i.e. how they evaluate and perceive such events. Cognitive behavior modification therapists did not refute environmental events, they claimed that such events were not of primary importance; rather how the client interprets those events through his cognitive structures was the most influential in determining his behavior. Cognitive behavior modification therapists claimed that change procedures were behavioral in focus but the process of change was viewed as largely cognitive (Meichenbaum and Cameron, 1980). So the difference between cognitive behavior modification and behavior therapy lies not in the techniques employed, but rather in the explanation of the reasons for change.

With this conclusion in mind, cognitive behavior modification therapists began to use techniques of behavior therapy such as modeling, counter-conditioning, to alter clients' cognitions such as how he interprets events and his internal dialogue. However, they view these techniques from a somewhat different perspective. For example the process of systematic desensitization was not seen as counter-conditioning but as an opportunity for a client to apply coping skills in a number of problem situations (Meichenbaum, 1978). When systematic desensitization was used by cognitive behavior modification therapists, it underwent some modifications to make the cognitive elements more explicit.

Two new parts were introduced into the classical desensitization process, one being the discussion of problem generating thoughts, and the other being the employment of coping imagery instead of mastery imagery. The former helps to make client aware of disturbing thoughts, the latter causes the client to visualize both the experience of anxiety and the ways to handle and reduce his anxiety. With the employment of coping imagery instead of mastery imagery, some slight changes were made in the classical systematic desensitization technique. When mastery type of imagery was employed, the imagination of a scene from the hierarchy was terminated as soon as the client signaled anxiety. Mastery imagery was in line with the principle of reciprocal inhibition in which the client's state of relaxation was paired with the imagination of anxiety evoking scenes. No consideration was given within the classical systematic-desensitization technique to the experience of anxiety by the client, after completing the therapy. In methods using coping imagery, the client was instructed to carry on his imagination of a scene from the hierarchy, even though he felt anxious but at the same time, employing coping skills in the form of deep breathing, self-instructions to relax and not to emit negative self statements. If the anxiety still persisted after that, the imagination was terminated. In his way the client visualized the experience of anxiety and ways of coping and reducing the anxiety. The aim of the coping imagery technique was to have the client view the anxiety he might experience after the therapy, as a signal for using coping skills. Thus the client's feeling of anxiety becomes the reminder to employ the learned coping statements. In his way the generalization effects was built into the therapy package.

(Meichenbaum, 1978).

For the reduction of test anxiety, Cognitive Behavior Modification (CBM) was proposed as the most effective treatment technique (Maichenbaum, 1971). The rationale behind this claim was that CBM deals with both the worry and the emotionality components of test anxiety. As it has been explained before, CBM consists of two main parts, analysis of problematic thought and modified systematic desensitization. The former is effective in dealing with the worry component while the latter helps to reduce the high level of emotionality. The effectiveness of CBM over other techniques in reducing test anxiety have been demonstrated by many investigators. In Meichenbaum's (1971) study, test anxious subjects were divided into two experimental groups as CBM and standard-systematic desensitization as well as one waiting list control group. After administering the two different therapy methods, the three groups were compared. The results indicated that CBM was significantly more effective than standard systematic desensitization in reducing test anxiety on self report and grade point average measures. Furthermore the CBM subjects and not the others reported an increase in facilitative anxiety i.e. when they felt anxious they viewed this as a signal to emit task-relevant responses and improve their performance (Meichenbaum, 1974).

D. Denney after researching all the recent behavior therapy procedures for the reduction of test anxiety, classified them into three categories and reported that "only 33% of the studies in the category of applied relaxation technique and 50% of the studies in the category of self-control training revealed performance measures, whereas 71% of the studies

in the category of coping techniques demonstrated improvement in these types of measures" (1978, pp.12-13).

Allen, after reviewing 75 investigations on reducing test anxiety, concluded that cognitive modification and vicarious learning strategies were the most effective (1980).

#### Group Administration of CBM

One last point to be noted is the explanation of the reasons for using groups instead of individuals in such cognitive oriented treatments. In two studies comparing the effectiveness of group and individual administration of the cognitive treatment procedures on test and speech anxiety, Meichenbaum found that group administration was as effective as individual administration. Cameron and Meichenbaum (1974) claimed that group administration of cognitive oriented treatments for the reduction of test anxiety has two advantages. The first one is related to practicability; with group administration considerable therapist time is saved. The second one is that in groups, subjects learn how other members look at the same phenomenon and their tactics to deal with it.

#### THE PURPOSE OF THIS STUDY

The aim of this study is to investigate the effectiveness of cognitive behavior modification in the reduction of test anxiety in a sample of Turkish eleven grade students. There is a wide-spread conviction that test anxiety is a widespread phenomenon among Turkish students, since the educational system places a great emphasis on marks obtained from tests in the over-

all evaluation of a student. The reduction of that anxiety could help the students improve their academic success.

#### THE HYPOTHESIS

The decrease of test anxiety in the experimental groups on the STAI and TAS will be significantly greater than that in the control group.

## M E T H O D

### SUBJECTS:

The subjects of the study were selected among Robert College, lycee-three students. Robert College was chosen as the site of application since the administration has an informal agreement with the psychology Department of Boğaziçi University allowing such programs. Additionally this program is not one which is affected by demographic variables such as socio-economic status, place of residence, family educational background, or by the composition of the family and levels of IQ as long as subjects were not below the average. So this study could be employed in any school for normal students. 20 students (8 male, 12 female) between the age of 17-18 were selected as the participants of the study.

### PROCEDURE OF SUBJECT SELECTION:

The subject selection procedure was carried out in two steps. In the initial step STAI was administered to all lycee-three classes, that is four sections of about 30 students each. From each class fifteen subjects who obtained the highest scores on the questionnaire were chosen as candidates for the second stage. STAI was used for subject selection procedure instead of TAS, because it had been standardized for Turkish students. (Le Compte and Öner, 1976).

Selecting fifteen from each section, a total of sixty subjects were invited to an interview in groups of threes or fives. In this second step the aim was first, to find those subjects who

were interested in such a study and second, to find those subjects who would be able to attend the weekly meeting for six weeks.

The subjects were asked if they wanted to join a group study on reduction of test-anxiety. If the answer was "yes", they were immediately told that this group study last six weeks in all and involve an 80-minutes session in each; attendance at every meeting was requested. It was also explained that the meeting hours would be fixed later in accordance with the free-times of the group members. Students who accepted these conditions were considered as probable group members.

It was decided that two groups, each having eight members, would be included in the study as experimental groups. The same number of subjects (sixteen) would make up the control group. The number eight had been specifically chosen because a group study with subjects more than eight would be difficult to conduct. It was clear that in each experimental group subjects would be coming from one section. Because of the class-schedule when students from different sections were put in the same experimental group, no free time for every subject would be found. This restriction made random assignment of subjects into experimental group impossible.

Students from sections C and D had to be excluded from the experimental group when their distribution of class-hours made it impossible to find a free 80-minute period suitable for everyone. Thus, students from section A and B appeared as only experimental subjects. This situation automatically reduced the number of subjects. Four students from section A and six

From B, accepting the required conditions, decided to join the study. About the same time, upon the resignation of a teacher, from section D, two students, whose free hours were the same as that of section A, decided to participate in the study. By putting these two subjects into the same experimental group with section A subjects, the number of participants in both experimental groups were made equal.

In selecting the control group subjects, twelve out of the remaining highest scoring lycee-three students were chosen through simple random sampling. As a result, a total of twenty-four subjects, twelve control and twelve experimental participated in the study. (See table 1).

	Experimental	Control
Experimental 1	6 subjects 1 boy, 5 girls Section B	12 subjects 5 boys
Experimental 2	6 subjects 3 boys, 3 girls Section A,B	7 girls

Table 1- Subjects at the beginning of the study.

EXPERIMENTAL DESIGN AND PRE-POST TESTING :

A two groups (Experimental and Control) pre-post test design was used for the study. Pre and post testing was done by the school counsellor in order to avoid demand characteristics. It was thought that if pre-post testing was done by the experimenter, subjects could score lower on the

post testing not because of the treatment procedure but because they would want to please the experimenter. To avoid such an uncontrolled variable in the study, the experimenter tried to make the students perceive the treatment and pre-post testing as two unrelated phenomena. To give that impression, during the pre-post testing procedure, the counselor told the students that she was administering the questionnaires just for her interest and would continue to administer them at bimonthly intervals, to find out how students' level of anxiety changes during the semester.

Pre testing was done at the beginning of November 1983 for STAI, at the end of November 1983 for TAS. Ten days after the administration of TAS, the weekly treatment sessions began, which ended on the 11th of January 1984 for the first experimental group, of the 18th of January 1984 for the second experimental group.

Although the aim was to apply the same treatment program to both experimental groups, experimental group 1 met regularly at fixed hours once a week but experimental group 2, after the first and second meetings never followed the fixed schedule. After a two weeks interval, the 3rd and 4th meetings were held on two successive days, then another 15 days passed before the 5th and 6th meetings which were held on the same day. The reason for these intervals was the absence of group members. Also one female member dropped out after the 2nd meeting.

For the post testing, STAI and TAS were administered by the school counselor, to all lycee-three students nine days after the completion of the treatment. But only the questi-

onnares of students who were included in the study were taken into consideration. One female subject from the experimental group, one female and one male subject from the control group were in the post test. At the end, the control and experimental groups each had ten subjects for the computation of the results.

	Experimental	Control
Experimental 1	6 subjects 1 boy, 5 girls	10 subjects
Experimental 2	4 subjects 3 boys, 1 girl	4 boys 6 girls

Table 2- The subjects of the study in the post testing.

## R E S U L T S

As the results were evaluated a certain reduction is observed in the test anxiety level of the experimental groups after the treatment, when compared with the control group, however, that difference proved to be insignificant.

Pre and post test means and standard deviations of the experimental and control groups on STAI, STAI-A-state, STAI-A-trait, and TAS was calculated and are presented on table 3. The figures 1,2,3 and 4 in which the presentation of the pre and post test means are shown in graph form will make the picture clearer.

As seen in the table and figures, in every measure the mean test anxiety level of experimental subjects on the post test was lower than that of the control group subjects. To evaluate this finding, t-tests between the differences of pre-post scores of the experimental and control subjects were calculated on each measure. The means and standard deviations of the differences between the pre and post test scores of the experimental and control group subjects on the four measures were found and presented on Table 4. No significant difference was found between the pre and post test difference distributions of the experimental and control groups on any of the four measures, ( $t = 1.005$  on TAS,  $t = .294$  on A-stated and  $t = 1.37$  on A-trait). Only the result of the  $t$ -test between the distribu-

Experimental Group

Control Group

Pre-test mean Post-test mean Pre-test mean Post-test mean

44.4 ( 9.17)	36.1 ( 8.9)	44.6 (8.15)	37.8 ( 7.33)
38.2 ( 5.13)	35.7 ( 5.3)	40.4 ( 6.2)	40.4 ( 6.2)
82.6 (12.5)	71.8 (13.9)	85 (12.9)	78.2 (11.3)
12.8 ( 3.6)	11.3 ( 6.4)	12.3 ( 4.37)	12.6 ( 4.6)

Table 3: Pre and Post test means and standard deviations of the experimental and the control groups on A-state, A-Trait, total STAI and TAS.

▲ Each condition (Experimental and Control) has 10 subjects

▲▲ Each condition (Experimental and Control) has 9 subjects

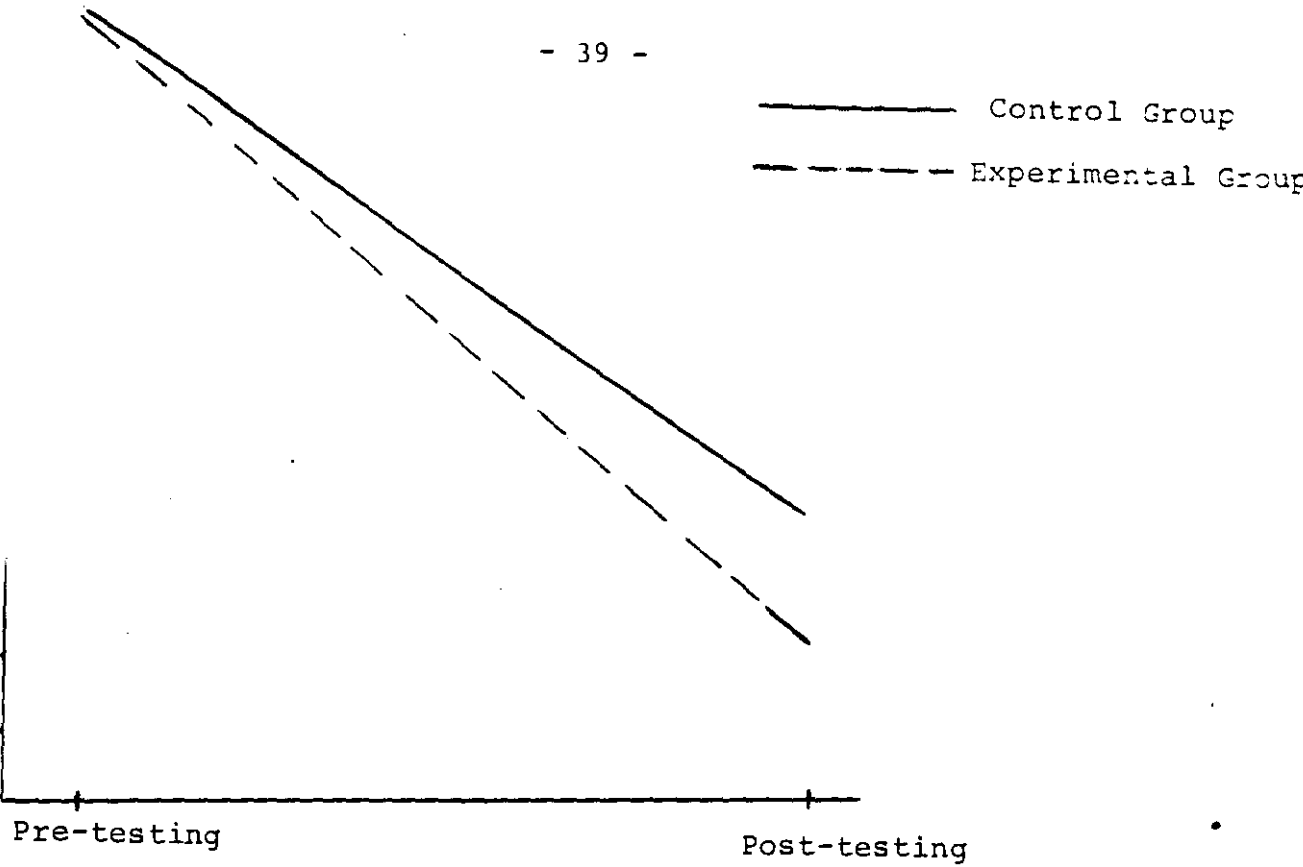


Figure 1: Shows pre and post test mean scores of the experimental and control group subjects on STAI A-state measure.

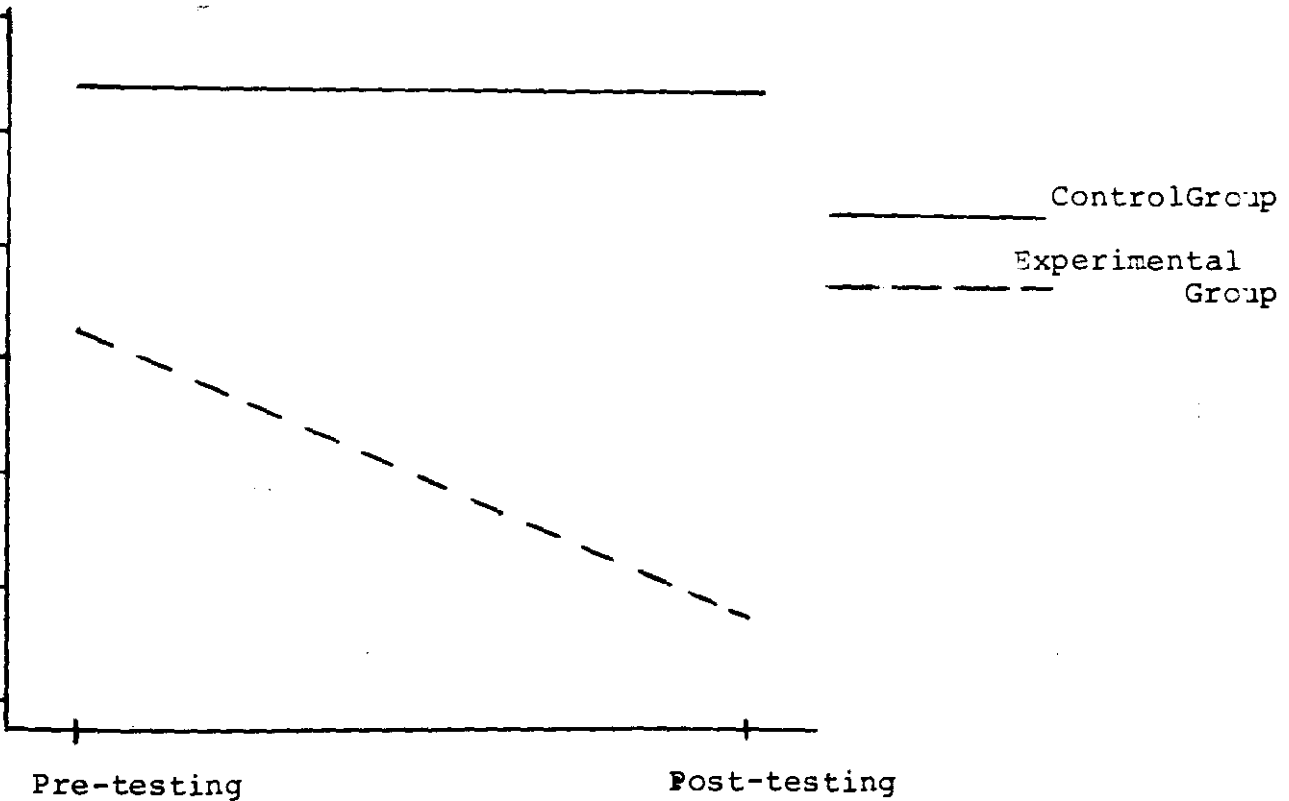


Figure 2: The pre and the post test mean scores of the experimental and the control group subjects on STAI A-trait

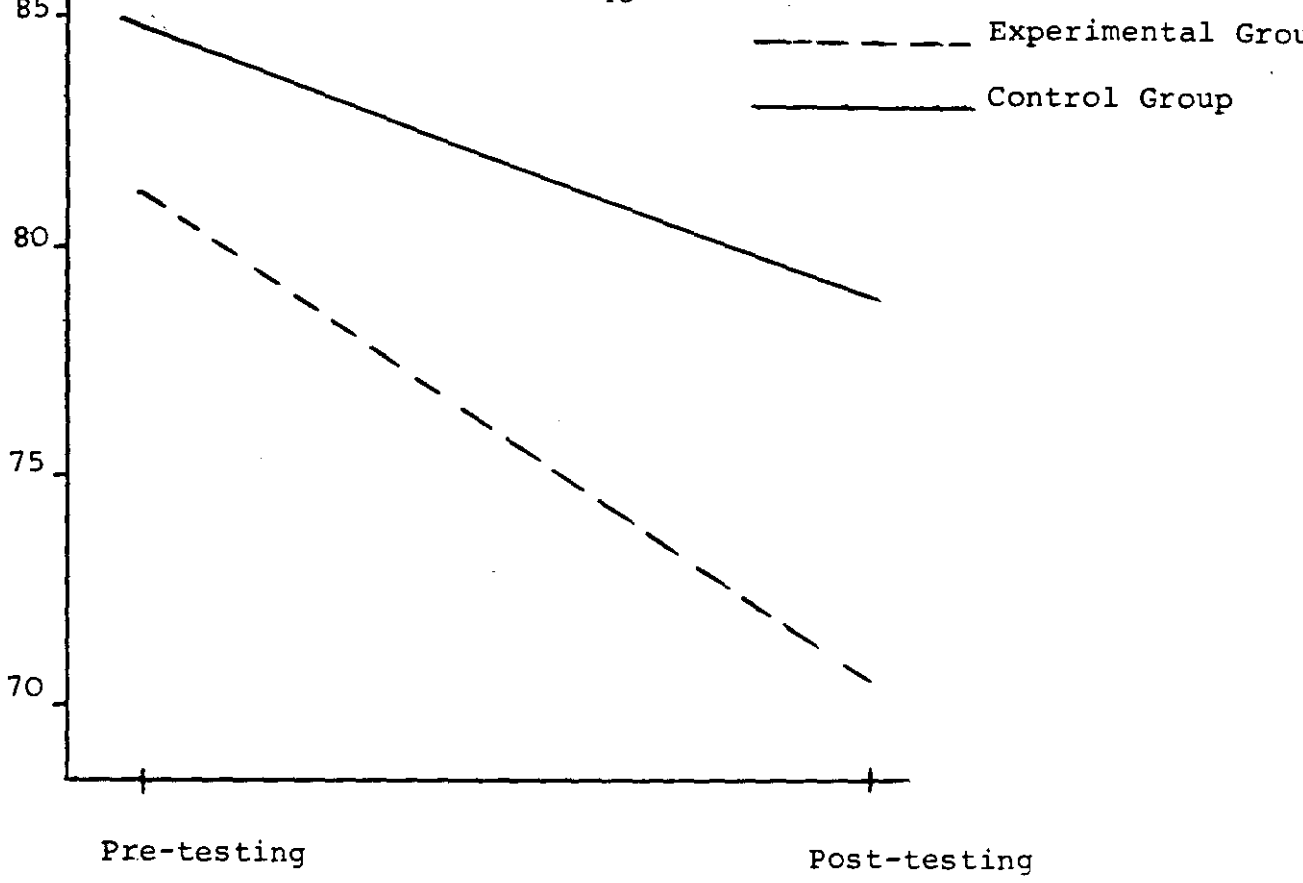


Figure 3: Shows pre and post test mean scores of experimental and control group subjects on total STAI measure.

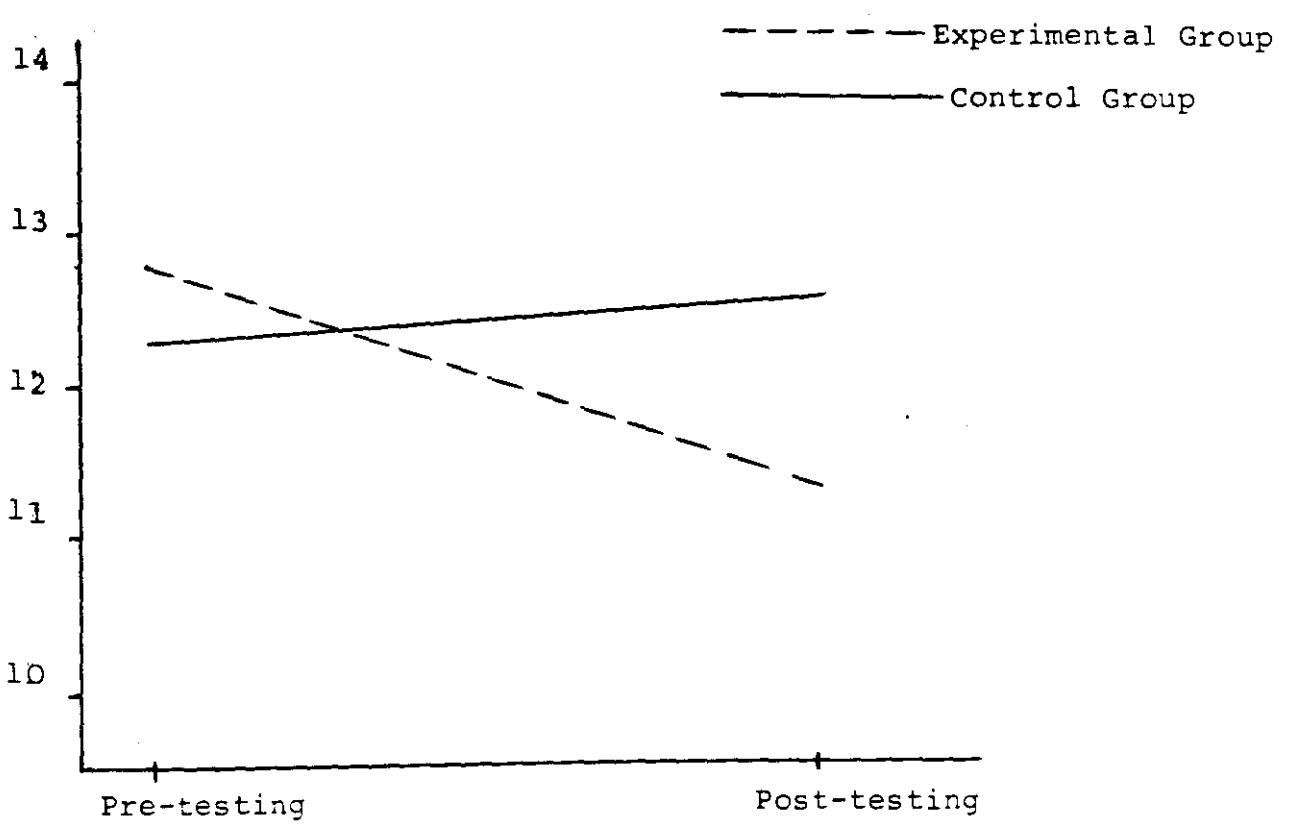


Figure 4: Shows the pre and the post test mean scores of the experimental and the control group subjects on TAS.

Experimental Group

Control Group

	Mean	S.Deviation	Mean	S.Deviation
I tate ▲	8.3	9.1	6.7	8.3
I rait ▲	2.5	4.08	0	3.8
I al ▲	10.8	11.7	6.7	7.3
▲▲	1.5	3.8	-.3	3.4

Table 4: Means and standard deviations of the pre-and post test scores differences of the experimental and control subjects on A-state, A-trait, STAI and TAS measures.

▲ Each group has ten (10) subjects

▲▲ Each group has nine (9) subjects

tion of the pre and post test scores for the experimental and control groups on anxiety trait approached the level of significant level.

Next, a two sample t-test was employed on each four measures between the pre test scores of the experimental and control groups. No significant difference between the two conditions prior to the treatment was found. The same t-test was used for the post test scores of the two conditions and no significant difference was observed after the treatment. However, on A-trait scale, the difference approached significance, ( $p < .05$ ,  $t = 1.710$ ).

In the next analysis a matched t-test was applied between the pre and post test scores of each condition on A-state, A-trait, total STAI and TAS. The reduction of anxiety between pre and post test scores on A-state and total STAI was found to be significant on both of the conditions (on A-state  $p < .05$ ,  $t = 2.42$  for the experimental group,  $t = 2.73$  for the control group and on STAI total  $p < .05$ ,  $t = 2.76$  for the experimental group,  $t = 2.79$  for the control group.) On A-trait measure while the means of the pre and post test scores were the same for the control group, a significant difference was observed between pre and post test scores of the experimental groups ( $p < .05$ ,  $t = 1.838$ ). For TAS the difference between the pre and post test scores of the experimental group was found to be non-significant, ( $t = 1.119$ ). On the same scale the scores of the control group subjects had slightly increased on the post test.

To analyze the results further a Mann Withney U test was applied between the distributions of differences of the pre and post test scores of the experimental and control group subjects on STAI and TAS measures. No significant difference was found on either measures,  $U = 26.5$  on TAS,  $U = 43$  on STAI).

As it has been stated in the method section two experimental groups were included in the study. Up to here, the results of the two experimental groups were combined. To see the effect of the treatment on both experimental groups, pre and post test scores of each experimental group on TAS and STAI were separated, and are presented on tables 3 and 4, figures 5 and 6 also present these results in graph form.

Figures and tables indicate that the reduction in the level of test anxiety in experimental group (exp. group two) was obviously more than experimental group one (exp.group one) and control group on TAS and STAI.

To test this result two sample t-test between the differences of pre and post test scores of the experimental group two and control group subjects were performed on TAS and STAI. The means and standard deviations of the distribution of pre and post test difference scores of experimental group two and control group subjects in TAS and STAI are presented on Table 5.

First, the t-test between the pre and post test difference distributions of experimental group two and control group subjects on STAI was calculated. Although the result was found to be nonsignificant it approached significance, ( $p < .05$ ,  $t=1.722$ )

Experimental Group-One		Exp.Group Two		Control Group	
Mean	S.Deviation	Mean	S.Deviation	Mean	S.Deviation
86.3	14.1	76.7	5.5	85	12.7
13.4	3.3	12	3.5	12.3	4.37

Table 5: The Pre-test means and standard deviations of experimental-one, experimental-two and the control groups subjects on STAI and TAS.

Experimental Group-One		Exp.Group two		Control Group	
Mean	S.Deviation	Mean	S.Deviation	Mean	S.Deviation
79.6	11.7	60	6.9	78.2	11.3
14.2	7.5	7.75	1.92	12.6	4.64

Table 6: The post-test means and standard-deviations of experimental one, experimental-two and the control groups subjects on STAI and TAS.

▲ On TAS two subjects scores (one in experimental group-one, the other in the control group) were missing in pre and post tests.

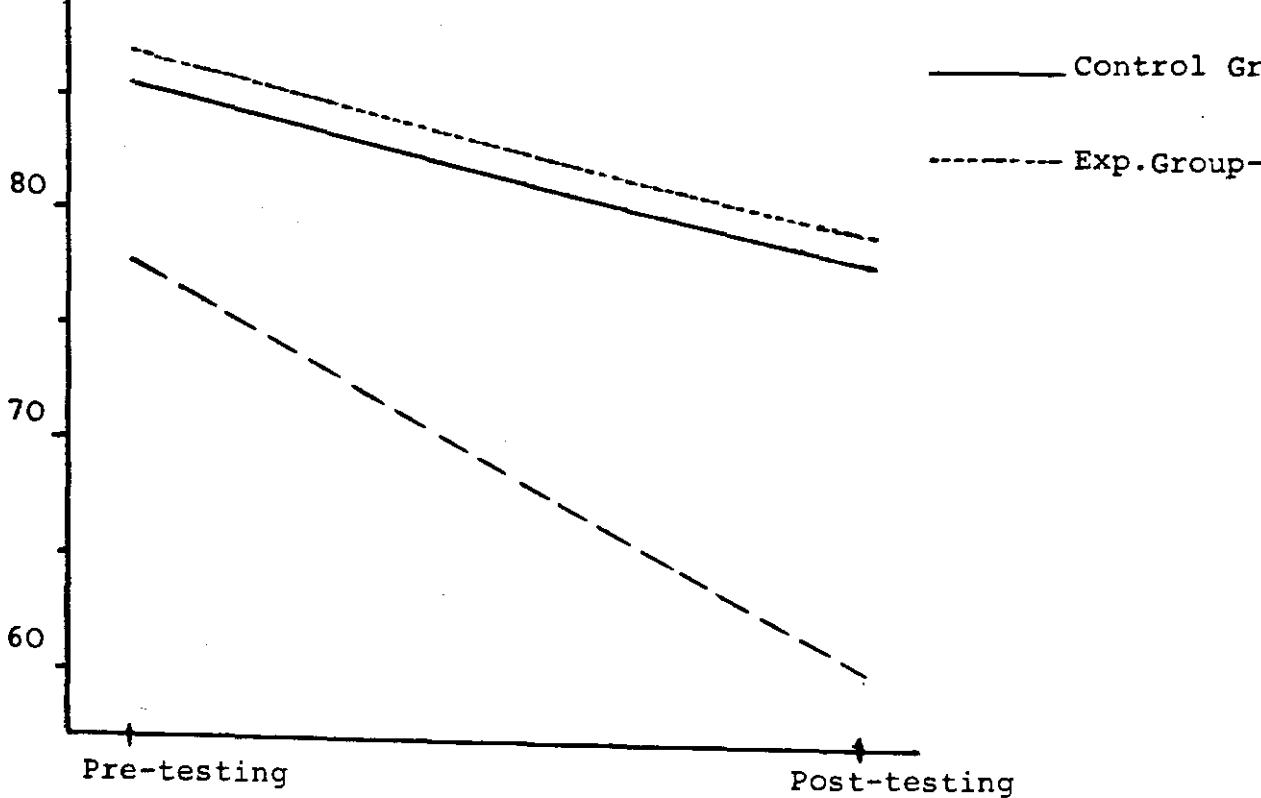


Figure 5: The pre and post test mean scores of experimental group-one, experimental group-two and the control group subjects on STAI.

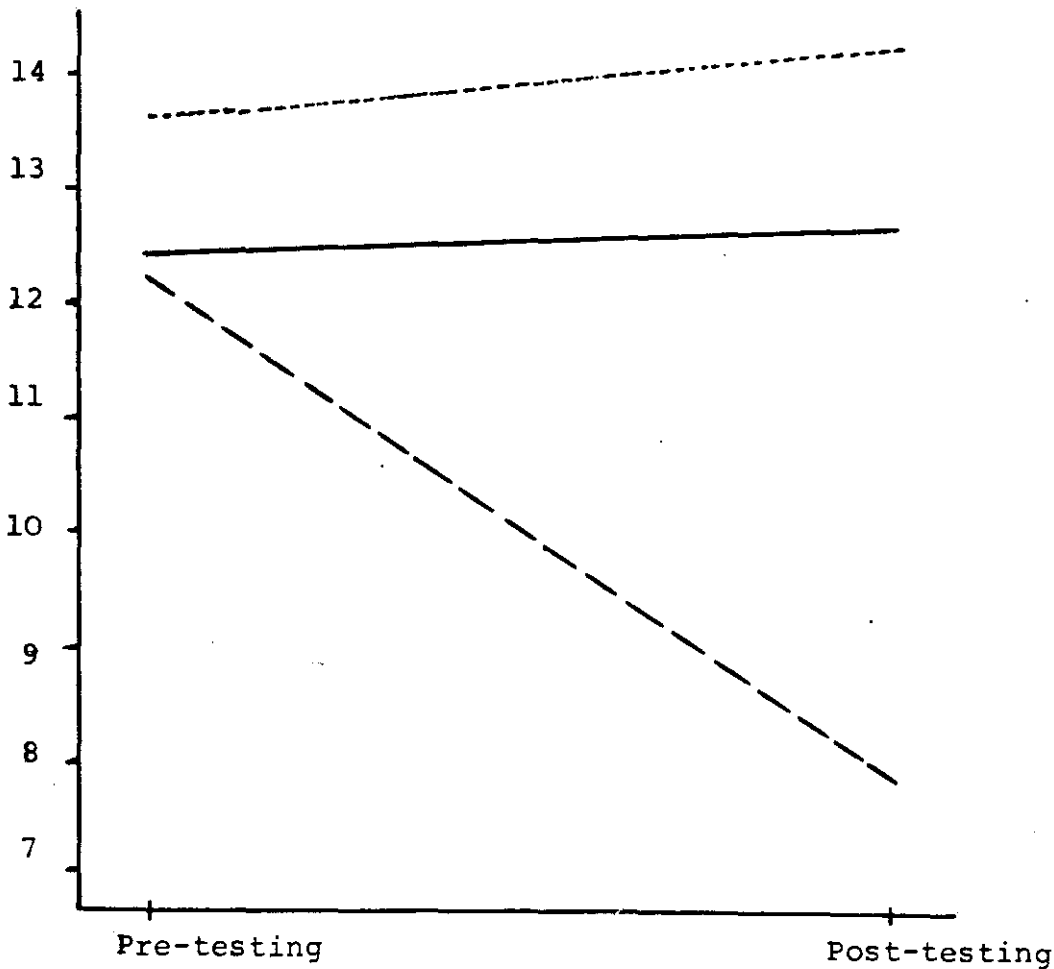


Figure 6: The pre and post test mean scores of experimental Group one, experimental group two and the control group subjects on TMS.

	Experimental Group-two		Control Group	
	N= 4		N=10	
	Mean	S.Deviation	Mean	S. Deviation
STAI	16.5	12.1	6.8	7.3
TAS	4.25	2.55	-.3	3.4

Table 7: Means and standard deviations of the pre and post test score differences of experimental group two and the control group subjects on TAS and STAI.

▲ On the TAS the control group has one missing subject (N=9)

On TAS, the difference between the pre and post test score difference distributions of the experimental group two and control group was found to be significant, ( $p < .05, t = 2.2$ ).

These results can be summed up as follows:

A- The reduction of test anxiety in the experimental groups was not significantly greater than that in the control group.

B- When the results of the two experimental groups were evaluated separately, the rate of improvement in the test anxiety was greater in the experimental group two than experimental group one. The level of reduction in experimental group two was significantly higher than the control group on TAS.

## D I S C U S S I O N

The hypothesis put forward in the Introduction was as follows: The decrease of test-anxiety in the experimental group on STAI and TAS will be significantly greater than that in the control group.

The results have shown that for both of the measures there were no significant differences between experimental and control groups, but when the results were calculated separately for each experimental group a significant difference was found between the experimental group-2 and control group.

After obtaining these results it may be worthwhile to focus attention on the uncontrolled variables that caused the experimental group's-1 results to be different from those of experimental group-2. One obvious difference can be seen in the meeting programs of the experimental groups. Experimental group-1 followed the fixed program, meeting once a week, but the experimental group-2 (after the 2nd session) never followed the fixed program. After an interval of two weeks, 3rd and 4th meetings were held on two successive days, again 2-weeks later two meetings (5th and 6th) were held on the same day. Subjects of the experimental group-2 declared at the last session that, the most noticeable decrease of their test-anxiety had occurred just after having meetings on two-successive days (3rd and 4th). This finding warns the experimenter who works on the reduction of test anxiety using CBM that, to have massed rather than scattered sessions in

the treatment program may increase the rate of improvement.

The other difference of the groups concerned is the intention with which the subjects joined in the study. At the last session, 4 of the subjects of Experimental group-1 openly confessed that they had wanted to participate in the study just for a change. However, all subjects in the Experimental group-2 said that they participated in the study to reduce their test-anxiety. This was the most important difference which may have lead to having different results.

As related to the discussion above, another distinction between the two-groups was about the parts of the treatment which was most liked. The imaginal part was said to be the most interesting by the subjects of Experimental group-1 whereas it was the discussion section of the treatment for Experimental group-2 subjects. Experimental group-1 subjects enjoyed passively imagining test-anxiety evoking conditions rather than actively participating in the treatment by discussing the anxiety generating thoughts as Experimental group-2 subjects liked.

This attitude of Experimental group-2 subjects gives an idea about their level of motivation in joining the study. However, it must be pointed out here that rather passive behaviors of Experimental group-1 subjects can also be a result of group composition. Five out of six subjects of experimental group were female whereas female subjects constituted only half of the Experimental group-2. Thus sex-role differentiation may have contributed to passive attitude of Experimental group-1 subjects.

For this study lycee-3 students were selected as subjects. The rational behind this decision being that this program was

mainly based on cognitive elements and subjects included in this treatment should have completed their cognitive maturation. However, with the selection of lycee-3 students another variable was included in the study which was also verbalized by the subjects at the end of the program. Subjects said that they had been exposed to test-anxiety for so long that they have just begun to ignore the test-anxiety, and act as if they did not feel any examination-anxiety. In learning theory terms this phenomenon can be named as learned-helplessness (Maier, 1967). When an animal is exposed to electric-shock so long that at last the animal stops all avoidant or escape behaviors, and begins to stay motionless and ignores the shock. That is the only way to deal with a prolonged stress.

That apathetic attitude of lycee-3 students toward examination stress may have seriously decreased their level of involvement with the program. Thus it is recommended to future similar studies dealing with the reduction of students' test-anxiety to select subjects from earlier years of lycee, but no earlier than that since cognitive maturation is completed at the age of fifteen.

Before finishing this part, two more limitations related to arrangement problems will be noted.

The first one is concerned with the arrangement of treatment sessions. The only free, 80 minute intervals were found on the last hours of subjects' daily class program. When subjects came to the meeting room they were totally exhausted, had little energy to spend on the treatment program. All subjects complained about this. It is recommended for future investiga-

tions which deal with similar problems to arrange their meeting hours at least in the middle of the day, if it is possible early in the morning. The second problem is about the arrangement of post-testing. One important drawback of this study was the administration of post-testing at the end of the first semester. This was the time when all exams were over, the stress of testing was minimized. Thus any decrease between pre and post testing may not be a result of treatment but may be due to the fact that final exams were over and students have relaxed. This of course indicates that ideal time for presenting such a treatment program would be in the beginning of a given semester.

In the summary of the discussion above, the following points can be stated:

Using massed rather than scattered sessions in treatments dealing with the reduction of students' test-anxiety with the use of the Cognitive Behavior Modification method, may be more effective.

Subjects' level of motivation is another factor that affects the effectiveness of the treatment. Subjects should actively participate in the discussion within the groups rather than passively listening to and watching the experimenter. Related to this, to have groups with similar levels of involvement, the sex of the subject in each group should be the same. Also, to have participating subjects, the topic to be discussed and treated should be interesting to the students.

Since the subjects have been living with high levels of test anxiety for a long time, the topic of the treatment, namely

test anxiety, loses its attractiveness which in turn affects the level of participation of the subjects.

The last two problems were related to arrangement limitations. Meeting hours should be fixed at an earlier time of day, so that subjects should not be exhausted with school activities when they enter the meeting room. It can also be recommended that, to carry out such a study at the beginning of the semester would give a clearer idea about the results of the treatment.

If post testing has to be done at the end of the semester, a reduction in the level of test anxiety may not be the result of the treatment, but it may be due to the absence of exams.

Although the hypothesis was not supported with the findings of the study, this should not immediately lead to the conclusion that the hypothesis was wrong. This study had some methodological and arrangement problems which could well have caused having such non-significant results.

REFERENCES

- Allen, B. Behavioral Treatment of Test Anxiety.  
In Hersen. M., Eisler, R., and Miller, P. (Eds)  
Progress in Behavior Modification (Vol-9) New-York: Academic  
Press, 1980
- Craighead, W.E., Kazdin, E.A., and Mohaney, M.J. Behavior Modifi-  
cation Principles, Issues and Applications. Boston: Houghton Com  
1976.
- Freud, S.A. General Introduction to Psychoanalysis. New-York:  
Washington Swuare Press Inc. 1964.
- Gombrill, E.D. Behavior Modification, Handbook of Assessment  
Intervention and Evaluation. London: Jossey Boss Inc. 1977.
- Hall, C.S., and Lindzey, G. Theories of Personality. New-York:  
John Wiley and Son Inc 3rd Edition 1978.
- Kazdin, A.E. Behavior Modification in Applied Settings.  
Illinois: The Dossey Press 1980.
- Maier, F.S. In Bower Gorgon H (Ed) Learning and Motivation.  
New York: Academic Press 1979, p.155.
- Meichenbaum, D. Cognitive Behavior Modification.  
New-York: Plenum Press, 1978
- Meichenbaum, D. Cognitive Behavior Modification News Letter  
Number- 4 Jan.1974, pp.12-13.
- Meichenbaum, D. In Hersen, M., Eisler, R., and Miller, P. (Eds).  
Progress in Behavior Modification (V-1). New-York: Academic  
Press pp. 96-103, 1975.
- Meichenbaum, D., and Cameron, R. The Clinical Potential of  
Modifying What Clients say to Themselves.  
Psychoterapy: Theory Research and Practice. Volum-11 No.2  
Summer 1974 p.108.

- Meichenbaum, D. and Cameron, R. Cognitive Behavior Modification: Current Issues. In Franks, C., and Wilson, T. Handbook of Behavior Therapy., New-York: Guildfad Press pp. 5-12, 1980.
- Mowrer, D.H. Learning Therapy and Personality Dynamics. New York: Ronald Press Col, 1950.
- Öner, N. State and Trait Anxiety in Turkish Patients and Normals. In Speilbeber, C.D. and Dioz-Guerro (Eds), Cross-Cultural Anxiety, Wash D.C. Hemisphere Pub-Comp 1983 p.109.
- Sarason, I.G. Abnormal Psychology Meredity Corp. New York: 1972.
- Sahakian, W. Psychotherapy and Counseling, Chicago: Rand Mc Nally College Pub. Comp 1976 .
- Speilberger, C.D. Anxiety and Behavior. New York: Academic Press, 1966.
- Speilberger, C.D., Anton, W.D. Bedel, J. The Nature and Treatment of Test Anxiety. In Zuckerman, M. and Speilberger, C.D. (Eds) Emotion and Anxiety New Concepts, Methods and Applications. Lea/Wiley. 1976, pp.317-324.
- Speilberger, C.D., Gonzales, H.P, and Flechter, J. Test Anxiety Reduction. Learning Strategies and Academic In O'Neil, H.F., and Speilberger, C.D. (Eds) Cognitive and Affective Learning Strategies. New York: Academic Press 1979. p.112-114.
- Wolpe, J. The Practice of Behavior Therapy. Toronto: Presgomon General Psychology Series., 1973.
- Wolpe, J. Theme and Variations. Toronto: Pergaman Press Inc. 1976.
- Zülemyan, A. A Comparison of Cognitive Therapy, Modified Desensitization, Cognitive Behavior Modification and Control Groups for Reducing Test Anxiety. Istanbul: Boğaziçi University, Yayınlanmamış Yüksek Lisans Tezi 1979.

FIRST WEEK

WHY TEST-ANXIETY AND WHY GROUP

BRIEF EXPLANATION OF THE LOGIC OF CBM

- A- Stimulus generalization
- B- Re-structuring of the problematic thoughts

THREE-STEPS OF THE PROGRAM

- A- Discussion of anxiety generating thoughts
- B- Relaxation
- C- Imagination training and counterposing the relaxed state with anxiety generating conditions

PRACTICE OF RELAXATION

HOMEWORK

- Third ear, watching himself about
- A- How and when they feel anxiety
  - B- What are the problem generating thoughts

SECOND WEEK

A brief summary of the last week

Brief explanation of systematic desensitization (a person cannot be relaxed and anxious at the same time).

Discussion about the home work

Reinforcements were given to those subjects who have completed the home work.

Common points in the discussion were stressed.

Functional analysis:

When, where,

under what conditions,

and how, do the anxiety generating thoughts appear.

What are the stimuli that control these thoughts.

PRACTICE OF RELAXATION

Home work

A- Continue listening to third ear.

B- Each subject was asked to write down the hierarchy of anxiety generating conditions.

### THIRD WEEK

Discussion about home work

More about functional - analysis :

Aware of the conditions in which anxiety appears. Especially when you are working.

When you feel anxious, change your location only for a short period of time (10 min). Phone to your friend, drink a lemonade or listen to music. So you avoid the establishment of a connection between your working room and anxiety. After 10 min interval come back and study.

Establishment of anxiety generating condition into a hierarchy. (A short discussion).

### RELAXATION TRAINING

Imagination training. Vivid imagination of a comfortable situation.

Counterposing of the first item of the hierarchy with a relaxed state.

### HOME WORK

Carry on listening to third ear.

FOURTH WEEK

Discussion about third session

Discussion about anxiety generating thoughts

Relaxation (Shorter version)

Counterposing:

2nd item of the hierarchy with relaxed state

3rd item of the hierarchy with relaxed state

(introduction of coping imagery)

Carry on listening to the third ear.

FIFTH WEEK

Discussion about anxiety generating thoughts.

Relaxation (Shorter version)

Counterposing

4th item of hierarchy with relaxed state.

5th item of hierarchy with relaxed state.

SIXTH WEEK

Discussion about anxiety generating thoughts

Relaxation (shorter version)

Counterposing of 6th item of the hierarchy with relaxed state.

Discussion about the program on the whole

Where were you

Where are you now.

What are you going to do in the future.

(future anticipation). How are you going to deal with evaluative stress in the future.

Which part of the program have you liked most.

KENDİNİ DEĞERLENDİRME ANKETİ

STAI FORMU TX-1

İsim: Cinsiyet: Tarih:  
Sınıf: Okul : Yaş :

YÖNERGE: Aşağıda kişilerin kendilerine ait duygularını anlatmada kullandıkları bir takım ifadeler verilmiştir. Her ifadeyi okuyun, sonra da o anda nasıl hissettiğinizi, ifadelerin sağ tarafındaki alternatiflerden en uygun olanını işaretlemek suretiyle belirtin. Doğru ya da yanlış cevap yoktur. Herhangi bir ifadenin üzerinde fazla zaman sarfetmeksizin su anda nasıl hissettiğinizi gösteren cavabı işaretleyin.

	Hemen <u>Hiç</u>	<u>Biraz</u>	<u>Ol- dukça</u>	<u>Tama- miyle</u>
1. Kendimi sakin hissediyorum	(1)	(2)	(3)	(4)
2. Kendimi emniyette hissediyorum	(1)	(2)	(3)	(4)
3. Huzursuzum	(1)	(2)	(3)	(4)
4. Pişmanlık duygusu içindeyim	(1)	(2)	(3)	(4)
5. Kendimi rahat hissediyorum	(1)	(2)	(3)	(4)
6. İçimde bir sıkıntı hissediyorum	(1)	(2)	(3)	(4)
7. İleride olabilecek kötü olay- ları düşünerek üzülüyorum	(1)	(2)	(3)	(4)
8. Kendimi dinlenmiş hissediyorum	(1)	(2)	(3)	(4)
9. Kendimi kaygılı hissediyorum	(1)	(2)	(3)	(4)
10. Kendimi rahatlık içinde hissediyorum	(1)	(2)	(3)	(4)
11. Kendime güvenim olduğunu hissediyorum	(1)	(2)	(3)	(4)
12. Kendimi sinirli hissediyorum	(1)	(2)	(3)	(4)
13. İçimde bir huzursuzluk var	(1)	(2)	(3)	(4)
14. Çok gergin olduğumu hissediyorum	(1)	(2)	(3)	(4)
15. Sukûnet içindeyim	(1)	(2)	(3)	(4)
16. Halimden memnunum	(1)	(2)	(3)	(4)
17. Endişe içindeyim	(1)	(2)	(3)	(4)
18. Kendimi fazlasıyla heyecanlı ve şaşkın hissediyorum	(1)	(2)	(3)	(4)
19. Kendimi neşeli hissediyorum	(1)	(2)	(3)	(4)
20. Keyfim yerinde	(1)	(2)	(3)	(4)

KENDİNİ DEĞERLENDİRME ANKETİ

STAI FORMU TX-2

İsim : Cinsiyet: Tarih:  
Sınıf: Okul : Yaş :

YÖNERGE: Aşağıda kişilerin kendilerine ait duygularını anlatmada kullandıkları bir takım ifadeler verilmiştir. Her ifadeyi okuyun, sonra da genel olarak nasıl hissettiğinizi ifadelerin sağ tarafındaki alternatiflerden en uygun olanını işaretlemek suretiyle belirtin, Doğru ya da yanlış cevap yoktur. Herhangi bir ifadenin üzerinde fazla zaman sarfetmekzizin genel olarak nasıl hissettiğinizi gösteren cevabı işaretleyin.

	Nadi- ren	Bazan	Çoğu zaman	Hemen Her Zaman
21. Keyfin yerindedir	(1)	(2)	(3)	(4)
22. Çabuk yorulurum	(1)	(2)	(3)	(4)
23. Olur olmaz hallerde ağla- yacak gibi olurum	(1)	(2)	(3)	(4)
24. Diğerleri kadar mutlu olmayı isterdim	(1)	(2)	(3)	(4)
25. Çabuk karar veremediğim için fırsatları kaçıtırırım	(1)	(2)	(3)	(4)
26. Kendimi zinde hissederim	(1)	(2)	(3)	(4)
27. Sakin, kendime hakim ve so- ğukkanlıyım	(1)	(2)	(3)	(4)
28. Güçlüklerin yenemeyeceğim ka- dar biriktiğini hissederim	(1)	(2)	(3)	(4)
29. Gerçekte çok önemli olmayan şeyler için endişelenirim	(1)	(2)	(3)	(4)
30. Mutluyum	(1)	(2)	(3)	(4)
31. Herşeyi kötü tarafından alırım	(1)	(2)	(3)	(4)
32. Kendime güvenim yok	(1)	(2)	(3)	(4)
33. Kendimi emniyette hissederim	(1)	(2)	(3)	(4)
34. Sıkıntı ve güçlük veren durum- lardan kaçınırım	(1)	(2)	(3)	(4)
35. Kendimi hüzünlü (kederli) hissederim	(1)	(2)	(3)	(4)
36. Hayatımdan memnunum	(1)	(2)	(3)	(4)
37. Aklımdan bazı önemsiz düşünce- ler geçer ve beni rahatsız eder	(1)	(2)	(3)	(4)
38. Hayal kırıklıklarını öylesine ciddiye alırım ki unutamam	(1)	(2)	(3)	(4)
39. Tutarlı bir insanım	(1)	(2)	(3)	(4)
40. Son zamanlarda beni düşündüren konular yüzünden gerginlik ve huzursuzluk içindeyim	(1)	(2)	(3)	(4)

SARASON 1

İsim : Sınıf : Cinsiyet  
Soyadı : Okul : Tarih

- 1- Önemli bir sınav yazarken diğer öğrencilerin benden ne kadar daha zeki olduklarını düşünürüm.
- 2- Eğer bir zeka testi alacak olsaydım, testi almadan önce çok kaygılanırdım.
- 3- Eğer bir zeka testi alacağımı bilseydim, testi almadan önce kendimi güvenli ve rahat hissederdim.
- 4- Önemli bir sınav yazarken oldukça çok terlerim.
- 5- Sınav esnasında önümdeki dersle ilgisi olmayan şeyler düşünürüm.
- 6- Beklemediğim bir sınava girmem gerekince çok büyük bir panik duygusuna kapılırım.
- 7- Sınav esnasında başarısız olmamın sonuçlarını düşünürüm.
- 8- Önemli sınavlardan sonra sık sık o kadar gergin olurum ki midem bozulur.
- 9- Zeka testi ve dönem sonu sınavı gibi şeyler karşısında donar kalırım.
- 10- Bir testten iyi bir not almak bir ikinci test konusunda güvenimi arttırmaz.
- 11- Önemli sınavlar esnasında bazen kalbimin çok hızlı çarptığını hissedirim.
- 12- Bir sınav yazdıktan sonra daima 'yaptığımdan daha iyisini yapabilirdim' duygusuna kapılırım.
- 13- Bir sınavdan sonra çoğu kez canım sıkın olur.
- 14- Bir dönem sonu sınavından önce huzursuz ve tedirgin bir duyguya kapılırım.
- 15- Bir sınav yazarken duygularım başarıyı etkilemez.
- 16- Bir sınav esnasında sık sık o kadar huzursuz olurum ki bildiğim şeyleri de unuturum.

- 17- Önemli sınavlara çalışırken sanki kendi zararına çalışıyormuşum gibi gelir.
- 18- Bir sınav yazarken veya sınava çalışırken ne kadar çok uğraşsam o kadar çok kafam karışır.
- 19- Bir sınav biter birmez sınav hakkında kaygılanmaktan vazgeçmeğe uğraşırım ama bir türlü başaramam.
- 20- Sınavlar esnasında bazen liseyi bitirip bitiremeyeceğimi düşünürüm.
- 21- Bir derste not için sınav yerine bir ödev hazırlamayı tercih ederdim.
- 22- Sınavların beni bu denli rahatsız etmemelerini dilerdim.
- 23- Yalnız olsaydım ve bir zaman sınırının baskısını hissetmeseydim, sınavlarda daha başarılı olurduym diye düşünüyorum.
- 24- Bir dersten 'Ne not alırım?' diye düşünmek çalışmamı ve sınavdaki başarıyı engeller.
- 25- Eğer sınavlar kaldırılsaydı sanırım daha fazla şey öğrenebilirdim.
- 26- Sınavlarda şöyle bir tavır takınırım 'Şu anda eğer bunu bilmiyorsam, bu konuda kaygılanmanın yeri yok'.
- 27- Bazı kimselerin sınav hususunda neden bu denli tedirgin olduklarını gerçekten anlayamıyorum.
- 28- Başarısız olma ile ilgili düşünceler sınavdaki başarıyı engeller.
- 29- Dönem sonu sınavları için, ders ödevlerime çalıştığımдан daha fazla çalışmam.
- 30- Önemli bir sınavdan önce yemekten hoşlanmam.
- 32- Önemli bir sınavdan önce ellerimin ve kollarımın titrediğini hissederim.
- 33- Bir sınavdan önce sabahlamak ihtiyacını çok ender duyarım.
- 34- Okul, bazı öğrencilerin sınav hususunda diğerlerinden daha huzursuz olduklarını ve bu durumun onların başarısını etkilediğini gözönünde bulundurmalı.

- 35- Sınav sürelerinin gerginlik yaratıcı bir durum haline getirilmemesi gerektiği kanısındayım.
- 36- Bir sınav kağıdını geri almadan hemen önce çok huzursuz olduğumu hissetmeğe başlarım.
- 37- Öğretmenin habersiz küçük sınavlar verme alışkanlığında olduğu derslerden çok korkarım.