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The recent differentiation between state and trait anxiety suggests that differential therapeutic approaches should be designed to treat both situation-specific and generalized anxieties. To test this assumption, test anxiety was chosen as an easily definable state anxiety. Forty-eight highly test-anxious subjects, students in the introductory psychology class at the University of North Carolina at Greensboro, were randomly assigned to one of four treatment conditions. Two experimental conditions, a test-specific stress inoculation training (TSIT) and a generalized stress inoculation training (GSIT) condition were compared with each other and with two control conditions, a discussion control (DC) and a waiting-list control (WLC). Subjects were administered the Test Anxiety Scale (TAS), State-Trait Anxiety Inventory (STAI), a verbal rating sheet, and the Fear Survey Schedule (FSS-III); their psychology test scores were recorded before and after the treatment. Treatment consisted of three 50-minute sessions conducted on an individual basis. A 3-week follow-up and an 8-month follow-up used the same measures, but only the data from the first follow-up are reported. On all measures except test grades, test-specific inoculation training proved superior to the control groups and generalized stress inoculation training was superior to the waiting-list control. The two stress inoculation training procedures did not differ on any of the measures. The data suggest that the nature of the coping statements might be the important factor.

THE REDUCTION OF TEST, STATE AND TRAIT ANXIETY BY TWO VARIANTS OF STRESS INOCULATION TRAINING

by

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CHAPTER I

INTRODUCTION

The consequences of constant and lengthy exposure to an anxiety evoking situation can be quite debilitating, causing withdrawal from the situation altogether. This problem is particularly damaging when anxiety is experienced in test-taking situations since success on tests dictates success in the academic setting which, in turn, determines, to a large extent, success in employment and later life. Poor performance on tests is not solely a function of the lack of preparedness or content mastery but may reflect a high level of anxiety. Even moderate levels of anxiety in evaluative situations can reduce the quality of performance, independent of the knowledge one brings to the test setting.

Persons experiencing high levels of test-related anxiety report a number of symptoms including self-oriented attention, a personalization of the challenge (Sarason, in Spielberger, 1972b, p. 393), self-deprecation, neglect of informational cues, attention toward task-irrelevant cues, and worry over one's own performance or the performance of others. Almost universally, the test-anxious person comes armed to the test setting with a list of negative self-statements about his performance (Child, 1954; Mandler & Sarason, 1952). The combination of these negative statements and past performance on tests leads to strong anxiety reactions and poor results. If these negative statements can be eliminated and positive self-statements substituted, the performance

on any one test should improve making subsequent test taking considerably easier. A treatment approach aimed at the successful modification of self-statements during testing situations, as well as in other settings, should lead to higher scores on tests, better course grades, and, ultimately, economic security and social acceptance.

Test Anxiety and Anxiety in General

The elevated arousal level and repeated negative self-statements present in test anxiety are tied very closely to specific stimulus events. The classroom, the act of receiving the test questions, the preparation in advance, all can trigger the test anxiety reaction. This reaction may involve response competition or arousal or social comparison fears. It may be that a person experiences very little general anxiety in his daily functioning but that the prospect of taking an examination and the accompanying cues trigger an intense anxiety response. Paul and Bernstein (1973) define anxiety as "a very complex pattern of responses; characterized by subjective feelings of apprehension and tension associated with physiological arousal involving the sympathetic branch of the autonomic nervous system" (p. 2). Test anxiety is simply a situation specific pattern of responses defined by the major stimulus of the anxiety responses, the taking of an examination.

Test Anxiety Treatments

Test-anxious college students have been treated successfully by a number of behavior modification procedures. Mann and Rosenthal (1969) found vicarious and direct counterconditioning through individual and

group desensitization to be effective. Debilitating test anxiety was also reduced over motivated and nonmotivated no-treatment groups by group desensitization in a study by Mitchell and Ingham (1970), and over relaxation-training-only individuals in a study by Johnson and Sechrest (1968). There were, however, no changes in self-report measures for the desensitization group.

Kostka and Galassi (1974) found covert positive reinforcement to be as good as group systematic desensitization on paper-and-pencil scores but superior on an actual anagrams performance test. These authors suggested that desensitization is too time consuming and the hierarchy construction too complicated for the non-expert, to be worthwhile. Covert reinforcement has also been found to be a successful treatment approach by other researchers (Cautela, 1970; Guidry & Randolph, 1974; Wisocki, 1973). Guidry and Randolph (1974) reported that their treatment was completed in five 30-minute sessions.

It was found that relaxation training alone worked to reduce test anxiety as measured by the Zuckerman Affect Adjective Check List and by systolic blood pressure and heart rate measures (Johnson & Spielberger, 1968).

Richardson and Suinn (1974) found that two short-term variants of desensitization were as effective in reducing test anxiety as standard desensitization. The first variant was anxiety management training through which the subjects were taught general skills in the control of their anxiety by first visualizing frightening scenes and then visualizing successful attempts at handling the frightening situations. The

rationale was to arouse feelings of competency in addition to aiding in the development of relevant coping skills. The second variant used in the Richardson and Suinn study was accelerated massed desensitization in which the subjects were exposed to only the top several items in the hierarchy appropriate to their problem, without the termination of the scenes by the subjects when anxiety was first experienced. The anxiety management training worked as well as massed desensitization even though it involved only one hour of direct training. None of the groups reduced anxiety to other fears, however.

Rational-emotive training has also been found efficient (Rimm & Masters, 1974), as has cognitive modeling (Sarason, 1973). Meichenbaum (1972) compared a cognitive modification treatment group (self-instructional training) with desensitization and a waiting list control. The cognitive modification procedure was significantly more effective than either of the other two groups as reflected in an analog test setting, grade point average, and self-report measures. This cognitive modification group was made aware of their anxiety-engendering thoughts and their negative self-statements and then were trained to emit incompatible self-statements of a positive nature. Self-instruction also reduced test anxiety, relative to an "insight" group, in a study by Wine (1971). His self-instruction group was instructed to attend to the self-statements they were making in the testing situation. A similar technique was found to be effective if combined with relaxation training (Little & Jackson, 1974).

Driscoll (1976) combined physical exertion and positive images to reduce test anxiety significantly more than taped desensitization.

These findings suggest that a cognitive modification procedure is an effective approach to reduce test anxiety and may be superior to traditional desensitization with regard to effectiveness and economy. Since it has been hypothesized almost universally that test anxious persons have interfering cognitions which cause the person to spend time on task-irrelevant overt and covert behaviors (Sarason & Ganzer, 1962, 1963; Spielberger, 1972), these cognitions need to be modified in order to reduce the anxiety completely. The common element in the more successful treatment approaches mentioned above seems to be some type of cognitive restructuring using positive incompatible statements. This suggests an ideal technique, stress inoculation training. Before describing this approach, the nature of anxiety needs to be explored more fully.

The State-Trait Distinction

The differentiation between state and trait anxiety is important in personality theory as well as in clinical assessment and treatment. The clearest approach to this distinction are Spielberger's (1972a, 1972b) conceptual and operational definitions.

> State anxiety (A-State) 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 characterized by subjective, consciously perceived feelings of tension and apprehension, and activation of the autonomic nervous system. (Spielberger, 1972a, p. 39)

This definition suggests to the clinician that the specification of the discrete situation which elicits the anxiety is important in the design of a treatment program. The specific and immediate situation which elicits the high arousal is usually easily identifiable and, thus, the arousal is modifiable.

Spielberger describes trait anxiety thusly:

> Trait anxiety (A-Trait) 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 A-state reactions. (Spielberger, 1972a, p. 39)

Trait anxiety can be seen as the predisposition of an individual to respond to a broad band of stimuli with anxiety reactions (Paul & Bernstein, 1973). In Spielberger's model, the presence of a stressor affects the individual's cognitive appraisal in addition to the associated internal stimuli (feelings, biological needs) and the level of trait anxiety. This trait anxiety leads to the state anxiety reaction which leads to the implementation of defense mechanisms. If the anxiety level is not high enough, a response will be made to the stimuli as if they were judged as non-threatening (Spielberger, 1972b). Spielberger clarifies the distinction with an analogy.

> The concepts of state and trait anxiety may be conceived of as analogous, in certain respects, to the concepts of kinetic and potential energy in physics. State anxiety, like kinetic energy, refers to an empirical process or reaction taking place at a particular moment in time and at a given level of intensity. Trait anxiety, like potential energy, indicates differences in the strength of a latent disposition to manifest a certain type of reaction. Where potential energy

> denotes differences between physical objects in the amount of kinetic energy which may be released if triggered by an appropriate force, trait anxiety implies differences between people in the disposition to respond to stressful situations with varying amounts of A-State. (Spielberger, Gorsuch, & Lushene, 1970, p. 3)

The relationship between these two constructs is concisely presented by these same authors.

> In general, it would be expected that those who are high in A-Trait will exhibit A-State elevations more frequently than low A-Trait individuals because they tend to react to a wider range of situations as dangerous or threatening. High A-Trait persons are also more likely to respond with increase A-State intensity in situations that involve interpersonal relationships which pose some threat to self-esteem....But whether or not people who differ in A-Trait will show corresponding differences in A-State depends upon the extent to which a specific situation is perceived by a particular individual as dangerous or threatening, and this is greatly influenced by an individual's past experience. (Spielberger, Gorsuch, & Lushene, 1970, p. 3)

Both constructs are, thus, forms of generalized anxiety, with trait anxiety referring to the predisposition to respond with anxiety when a stressor is presented. State anxiety is the response to an immediate presentation of the stressor, and test anxiety, therefore, is but one form of state anxiety, defined by the test-taking situation.

The equivocal results of studies in which anxiety levels are the dependent variable are due, in large part, to the failure to properly distinguish between these two types of anxiety. Several studies have shown directly the necessity for this differentiation. Allen (1970) states that many of the contradictory findings are due to the fact that many state anxiety scales measure both state and trait anxiety,

indiscriminately. Testing for the effects of situational aspects on anxiety scale scores, Allen found:

> The results of this study indicated that TA (test anxiety) scales typically thought to measure traits are quite robust, since the relative standing of Ss on these scales is not strongly affected by situational demand characteristics, as are state scales. The latter scales should, therefore, be used with caution, especially in paradigms which demand repeated measurement of anxiety. (Allen, 1970, p. 358)

Alpert and Haber (1960) directly measured the relative effectiveness of the trait anxiety measures as opposed to those measuring anxiety in specific situations (state scales). These authors concluded:

> The implications of the findings are reasonably clear. Specific anxiety scales and general anxiety scales measure, to a significant extent, something different. Furthermore, it appears that the variable which the specific scales measure, and which the general scales do not, is involved in academic performance to such an extent that the specific scales are better predictors of academic performance than are the general anxiety scales. (Alpert & Haber, 1960, p. 209)

The necessity of differentiation between these constructs is further provided by Johnson and Spielberger (1968). Measuring the effect of relaxation training and the passage of time on state and trait anxiety, these authors conclude:

> A-state measures declined significantly in response to the relaxation training procedures; A-trait measures were impervious to variations in stimulus conditions. Correlations between A-trait measures were high and stable over time; correlations among A-state measures were moderate or negligible. Findings were interpreted as supporting the view that it is meaningful to posit state- and trait-anxiety as separate and distinct anxiety constructs. (Johnson & Spielberger, 1968, p. 23)

Sarason (1957) compared specific state anxiety (test anxiety) and general anxiety scores with performance on the Scholastic Aptitude Test, the Mathematical Aptitude Test, and the yearly grade point averages of college students. He concluded:

> It is clear, however, that it is important in discussing the effects of anxiety on performance to specify the manner in which anxiety is measured (i.e., by means of which instrument). The results of the present study reveal the importance of establishing the specific situations in which an individual experiences anxiety if one is interested in predicting his future performance in specific situations. (Sarason, 1957, p. 489)

Recently Lamb (1976) reiterated this important point by showing that his specific trait measures predicted specific anxiety states better than general trait measures.

The importance of the state-trait distinction is obvious in the clinical setting. If a person exhibits intense anxiety reactions only in very discrete situations with very specific stimulus antecedents, a specific, situation-tied modification program is suggested. However, if the person responds in the same manner to many situations, predicated by a variety of stimuli, a more generalized modification program is indicated.

Relationship of Test Anxiety to State and Trait Anxiety

State anxiety has been defined as a feeling of tension and arousal in response to an immediate stimulus or situation. It is clear that the feeling of tension and apprehension when confronted with an examination is a special case of state anxiety. In probabilistic terms, a person with high levels of trait anxiety would exhibit test anxiety with greater

liklihood than a person with a low level of trait anxiety. If the person with a high level of trait anxiety felt competent in the test taking situation and had experienced no difficulties in the past with such situations, test anxiety would not be likely to occur, however. Both state and trait anxiety are generalized anxiety; when the stimulus for the anxiety reaction is defined, state anxiety becomes a specific anxiety reaction, as in the case of test anxiety.

Trait Anxiety Measures and Treatment

Trait anxiety has been measured by a variety of general anxiety scales, including the Taylor Manifest Anxiety Scale (MAS, Taylor, 1953), the Welsh Anxiety Index (AI, Welsh, 1952), the General Form of the Affect Adjective Check List (AACL-G, Zuckerman, 1960), the General Anxiety Scale (GAS, Sarason, 1972), and the trait anxiety section of the State-Trait Anxiety Inventory (STAI, Spielberger, Gorsuch, & Lushene, 1970). These scales purport to measure the relatively constant, internal anxiety within individuals. The logic follows that a collection of situation-specific anxiety causing events should combine to measure the general or manifest anxiety level. This conclusion, however, is currently being questioned (Alpert & Haber, 1960; Sarason, 1957). At the present time, the State-Trait Anxiety Inventory's trait portion is the best measure of trait anxiety levels. The test-retest correlations range from .73 to .86 and internal consistency, concurrent validity and construct validity are also high (Spielberger, Gorsuch, & Lushene, 1970). Several score reversals are included to eliminate set responding. A sample test blank is included in Appendix A.

Trait anxiety has been treated by drugs, multiple hierarchies in systematic desensitization (Goldfried, 1973), coping skills training (Mahoney, 1974), and, under the guise of pervasive anxiety, by Wolpian carbon dioxide inhalation/relaxation training. According to Wolpe, carbon dioxide inhalation diminishes anxiety enough for desensitization to occur although the mechanism behind the anxiety-reducing effects is unknown (Wolpe, 1973, p. 185). The techniques above are often successful in reducing general anxiety, probably due to situation generalization. The common elements from situation to situation may be responsible for this general improvement. As a general rule, however, the treatment is lengthy when systematic desensitization is used, shorter with anxiety management and coping skills training, and ineffective if relaxation is used alone (Johnson & Sechrest, 1968; Johnson & Spielberger, 1968). In order for a modification procedure to be effective and economical in dealing with trait anxiety, the common feature from situation to situation must be identified and dealt with. The maladaptive, negative self-statements present during anxiety reactions, across situations, may be this common denominator.

State Anxiety Measures and Treatment

State anxiety, defined by the situation in which the arousal is heightened, is much more easily assessed and treated. If the level of state anxiety is high enough, or if the stress producing situation is present constantly in the individual's environment, or if the situation occurs over a long period of time, it can be highly debilitating. Avoidance responses may result. Non-situation specific state anxiety

is most effectively measured by the state section of the State-Trait Anxiety Inventory (Spielberger, Gorsuch, & Lushene, 1970). A sample test blank is provided in Appendix B.

The test-retest reliability correlations for college undergraduates on the state section of the STAI range from .16 to .54. Since this section is purported to measure anxiety in the presence of discrete situational factors, this low correlation is expected. The internal consistency is a better measure of the reliability of the state anxiety scale, and these reliability coefficients range from .83 to .92. The state and trait scales are correlated between .11 and .53 (median of .30) for females and between .37 and .67 (median of .47) for males.

A specific state anxiety, test anxiety, has been assessed by a variety of paper-and-pencil tests as well as by self-report measures and physiological recordings. Included in the former group are the Test Anxiety Scale (TAS, Sarason, 1972), Achievement Anxiety Test (AAT, Alpert & Haber, 1960), and the Suinn Test Anxiety Behavior Scale (STABS, Suinn, 1969). The logic behind these tests is that maximum sensitivity to a state anxiety is provided by a test which is comprised of situation specific items. Reliability runs fairly high for these tests, with the AAT, for example, having a test-retest reliability over a 10-week interval of .83 for the facilitation section (anxiety which is helpful) and .87 for the debilitation section (anxiety which distracts). Over an 8-month period, the test-retest reliabilities are .75 and .76, respectively (Alpert & Haber, 1960).

The same treatments which were used to reduce test anxiety have been used to reduce generalized state anxiety. By changing hierarchy content in systematic desensitization, the stimulus-tied self-instructions in cognitive modification procedures, and so on, any form of state anxiety may be treated. Relaxation training was used to reduce A-state measures significantly, including systolic blood pressure, heart rate, and scores on the Affect Adjective Check List (Johnson & Spielberger, 1968). Vicarious and direct counterconditioning proved successful in individual and group therapy with state anxiety (test anxiety) (Mann & Rosenthal, 1969). Counterconditioning reduced state anxiety significantly more that progressive relaxation training in a study by Johnson and Sechrest (1968). Again, since test anxiety is one form of a state anxiety, treatments for one situation-specific anxiety can be used for anxieties tied to other environmental settings.

Stress Inoculation Training

Stress inoculation training, as explained by Meichenbaum (1973) and Meichenbaum and Turk (1975), is a procedure which assumes that the client's internal dialogue is an important factor in anxiety reactions and that the modification of cognitions is as important as the modification of overt behavior. If cognitive events are viewed as "...specific sets of self-statements and/or self-instructions which the client could be trained to alter," the possibility for modification is suggested (Meichenbaum, 1973, p. 6-7). Stress inoculation training is similar to other coping skills and self-instructional methods used earlier by various researchers (Meichenbaum, 1969, 1971; Meichenbaum & Cameron, 1973).

In stress inoculation training, the client is first instructed as to the nature of anxiety reactions within a behavioral framework. Second, the client is asked to rehearse coping behaviors, and last, he is provided with an opportunity to practice the constructive coping skills that he has learned in the presence of a stressful stimulus. This exposure phase differentiates stress inoculation training from earlier coping skills treatments (Meichenbaum, 1975). It remains to be shown whether the positive coping statements interfere with test taking.

The educational phase provides the client with a cognitive framework to help explain his stress reaction and anxiety in general. The treatment rationale is presented, and the number of sessions and scheduling are decided upon. The rehearsal phase usually includes a relaxation training period. The potential superiority of the stress inoculation approach depends, however, on treating anxiety as quickly as possible without much time being spent on detailed relaxation training. Relaxation and regular breathing is encouraged, but muscle relaxation training is not included. Elimination of the lengthy relaxation portion of therapy should, if the results are satisfactory, point toward this technique over more lengthy procedures.

The client is then asked to report his own negative self-statements which are usually present during the anxiety-producing situation. Then, incompatible self-statements are suggested, with the subject being the originator of the statements to be used. These positive statements involve four areas: preparation for a stressor, confronting the stressor, facing the possibility of being overwhelmed by the stressor, and

reinforcing oneself for successfully coping in the situation. These positive statements are rehearsed by the subject aloud and, subsequently, covertly.

After proficiency has been established, the subject is instructed to practice his new skills in the presence of the stressor. The purpose of this practice is that the presentation of the initial stress-producing stimulus will force the exercise of the new coping skills without the threat of catastrophic results. Preparation is believed to temper the effects of the stressful event.

Stress inoculation training and related coping skills procedures have been found to be effective in dealing with a variety of problems including test anxiety (Meichenbaum, 1972; Wine, 1971), non-assertiveness (Glass, 1974; Shmurak, 1974 cited in Meichenbaum, 1975), the control of anger (Novaco, 1974), preoperative stress (Langer, Janis, & Wolfer, 1974), and ischemic pain (pain due to artery constriction through thermal stimulation) (Turk, 1975). This study uses specific coping statements to see if the nature of these statements is an important variable.

Statement of Problem: Stress Inoculation and Test Anxiety

Stress inoculation training is a relatively new therapeutic approach and should be tested with a variety of presenting problems and with internal modifications to verify the efficacy of its components. There is a great temptation, in the early stages of the development of a treatment paradigm, to enthusiastically embrace it without critical evaluation. This uncritical enthusiasm can lead to uneconomical and even iatrogenic consequences.

Test anxiety is particularly amenable to the cognitive modification process present in stress inoculation training. The subject is first instructed as to the paradigm, assumptions, and reported effectiveness of stress inoculation therapy. Next, some of the common cognitive symptoms of test-taking anxiety are examined, such as self-oriented attention, a personalization of the challenge (Sarason, 1972), attention toward task-irrelevant cues, neglect of informational cues, self-deprecation, and excessive worry. Emphasis is placed, of course, on the subject's particular response while he is taking a test. After this introduction and with some general guidelines about successful study behaviors, specific negative self-statements are pin-pointed; a list of possible alternative, positive statements is drawn up and rehearsed while the subject is in a relaxed state. Then, by means of behavioral rehearsal with imagery, the subject is exposed to a detailed, graphic test-taking situation.

Meichenbaum's list of coping statements includes generalized coping statements. This study will explore the relative effectiveness of these generalized statements versus more test-specific self-statements. Meichenbaum (1972) and Wine (1971) using general statements, have found stress inoculation training to be effective in significantly reducing test anxiety. It would be of great value to determine whether statements of a specific nature are more successful in reducing an anxiety of a specific nature than more generalized statements, because the therapist's attention can then be focused entirely on the construction of a situation-specific list of coping statements. Details of the particular

situational complex could be incorporated to enhance the imagery process in the third phase of the therapy and to increase the likelihood of transfer from the therapy setting to the anxiety producing setting.

Coping statements which contain specific references to the test-taking situation should be successful in the modification of test anxiety, whereas statements of a more general nature should reduce anxiety across situations. Since systematic desensitization has little effect on general anxiety or with anxiety to situations and stimuli removed from the actual hierarchical items, a semantic approach which modifies self-verbalizations across situations would prove to be invaluable. It was hypothesized that subjects given the test-specific stress inoculation training should show lower test anxiety scores than subjects with generalized stress inoculation training. However, subjects with the more generalized stress inoculation training should show lower trait anxiety and state anxiety scores than subjects trained under the test-specific condition. It was also hypothesized that subjects treated under either of the two stress inoculation training conditions should show lower state, trait, and test anxiety scores than subjects under a discussion control or a waiting list control condition.

If the subjects trained with test-specific coping statements should show significantly more reduction in test anxiety scores, support would be given to constructing situation-specific statements with regard to the presenting problem of the client. If this reduction in test anxiety were not accompanied by a significant reduction in anxiety in other situations, however, one could question the practical utility of a

situation-specific approach. A significant reduction of both test and generalized anxiety by the more generalized approach might indicate the usefulness of a non-situation bound list of statements. The client might be taught one battery of coping statements which he/she could use in any stressful situation.

The scattered positive results from cognitive approaches to more generalized anxiety suggest that stress inoculation should reduce trait anxiety as well as state anxiety. Many of the coping statements used by Meichenbaum and Turk (1975) are general enough to suggest their application over a variety of situations. In fact, Meichenbaum views this relatively new technique of inoculation as a:

> ...shift in behavior therapy from a focus on discrete situation-specific responses and problem-specific procedures to a coping skills model which can be applied across situations and problems.... (Meichenbaum & Turk, 1975, p. 23)

In summary, if this relatively new behavior modification procedure is successful in treating test anxiety in as few as three treatment sessions (one day for each phase of the training), it may be included in the therapist's battery of therapeutic techniques. If, in addition to the reduction of test anxiety, a generalized stress inoculation procedure can modify less stimulus-specific anxiety (state and trait anxiety), then it may suggest future research to assess its success relative to systematic desensitization and other modification techniques in dealing with anxiety.

CHAPTER II

METHOD

Subjects

Forty-eight undergraduate introductory psychology students were randomly selected from the population of highly test anxious students in the class. The selection and screening of these subjects were based entirely on their scores on the Test Anxiety Scale (Sarason, 1972), and the cut-off score was 23 out of a possible 37 points. The subjects were then randomly assigned to one of four treatment conditions: 12 subjects, 10 females and 2 males, for the test-specific stress inoculation group (TSIT), 11 females and 1 male for the generalized stress inoculation training group (GSIT), 10 females and 2 males for the discussion control group (DC), and 8 females and 4 male subjects for the waiting list control group (WLC). Except for the WLC group, the subjects were seen individually three times over a 3-week period and again at a 3-week follow-up. An 8-month follow-up will also be conducted, but this follow-up data will not be included as part of this thesis. Only 10 subjects in each condition were accessible at the 3-week follow-up data collection.

The subjects, 9 males and 39 females, received credit for participation in this study as partial fulfillment of the requirements of Psychology 221 at the University of North Carolina at Greensboro.

Design

The 48 highly test anxious subjects were randomly assigned to one of four treatment conditions. The two experimental conditions, test-specific stress inoculation training (TSIT) and the generalized stress inoculation training (GSIT), were compared with each other and with two control conditions, a discussion control (DC) and a waiting list control (WLC). Subjects were compared on the basis of their difference scores (pre-treatment versus post-treatment) on the Test Anxiety Scale (TAS), State-Trait Anxiety Inventory (STAI), the Fear Survey Schedule (FSS-III), a verbal rating scale taken during an actual test, and examination scores from tests given in the introductory psychology class. No test scores will be available at the 8-month follow-up, however. Treatment covered three 50-minute sessions on an individual basis. The 3-week follow-up is included which uses scores on the TAS, STAI, and the FSS-III. Comparisons between groups were based on the difference scores (follow-up versus pre-treatment and follow-up versus post-treatment).

Treatments

Generalized stress inoculation training (GSIT). This procedure is based upon the stress inoculation programs initiated by Meichenbaum (1973). Meichenbaum uses generalized statements, and it is for this reason that this type of stress inoculation training is included in this study where a highly specific anxiety is being measured. The first (of three) treatment sessions included an introduction to the theory of anxiety as proposed by Spielberger in 1972. Also, an introduction to the stress inoculation procedure and informal relaxation training were

included in this session. Informal relaxation included simply instructions to sit back in the reclining chair provided, get comfortable by removing jewelry and binding clothes, and to breath deeply and relax. The therapy was conducted in a dimly lit room. The responsibilities of the subject within the experiment were also discussed during the first session. The STAI and the FSS-III were administered at this time. Detailed instructions are presented in Appendix C. The second session, the rehearsal phase of the stress inoculation procedure, included making the subject aware of his/her negative self-statements by prompting the subject with a few common self-defeating statements. Next, the subject and the experimenter/therapist checked, from the list of incompatible positive self-statements and reinforcement statements (Appendix D), two or three statements from each group to be used by the subject in the exposure phase. Positive statements used in preparation for a stressor included: "What is it I have to do?," "No negative self-statements, just think rationally," and "Maybe what I think is anxiety is eagerness to confront it."

Statements used when confronted with the stressor included: "One step at a time, I can handle the situation," "Relax, I'm in control; take a slow deep breath, Ah, good."

Meichenbaum and Cameron (1973) also suggest several statements to be used to cope with the feeling of being overwhelmed, such as: "When fear comes, just pause," "It's not the worst thing that can happen," "My muscles are starting to feel tight; time to relax and slow things down." The last set of statements, for reinforcing purposes included:

"It worked, I did it," "It's getting better each time I use the procedures," "I handled it pretty well." These statements were rehearsed overtly by the subject twice following the experimenter's reading of each chosen statement. The subjects were then told to rehearse the statements chosen every day between the second and third sessions and to put these statements to use whenever confronted with a stressful situation. This was verified at the beginning of the third session. The third session also involved one overt rehearsal and then exposure to the anxiety-producing situation (test taking) through imagery. The room where the subject took the psychology tests was described in detail, along with the process of having the tests handed out, the instructions usually given before the test, and the presence of others in class. The subject was then instructed to use the coping statements when he/she felt the anxiety increasing. When the test scene was terminated the subject was instructed to reinforce his/her use of the coping statements and the management of his anxiety by repeating the reinforcing self-statements chosen in the second session. The TAS, STAI, and the FSS-III were then filled out by the subjects.

Test-specific stress inoculation training (TSIT). Because the situation is fairly well specified when dealing with test anxiety, it is hypothesized that a more specific form of cognitive modification therapy, that is, stress inoculation training containing self-statements of a more specific nature, would be more successful than a general approach. This condition was included to test this hypothesis. The procedure was entirely the same under this condition as with the GSIT, except for the

nature of the self-statements used from the second stage on. Appendix E includes the list of coping statements that were more test-oriented than those used with the GSIT individuals. For example, in the section designed for use during the preparation period, statements were included such as: "I know I'm well prepared for this test, so just relax," "Before I look at the first questions, take a deep breath," and "I don't care what others are doing around me; I know this material as well as they do, maybe better." When actually confronting the test, suggested statements included: "A little test anxiety is natural and it's a reminder to use my coping skills," "If I'm not sure of several questions in a row, I'm not going to panic, but I'll sit back for a moment and take a few deep breaths and relax." The third section, coping with the feeling of being overwhelmed, included: "Since the test covers so much material, I'm bound not to know everything for sure; just answer each item the best I can," and "My muscles are starting to tense up; it's time to relax and slow things down; I have plenty of time to finish the test."

The reinforcing self-statements included items such as: "I knew the material and it will show up in my grade," "My confidence wasn't even shaken when others turned in their papers before I was finished," and "I handled that test pretty well; now I can almost look forward to the next one." Three sessions were used with these subjects, and the same pre- and post-treatment assessment devices were used.

Discussion control (DC). This group was included to control for nonspecific factors associated with expectancies, demands, and interactions with the therapist. Twelve subjects were seen for three 50-minute

sessions as in the two experimental conditions. The format given in Appendix F was read verbatim, and Spielberger's theory of anxiety was discussed with each subject. The experimenter answered questions about test anxiety and the possible debilitating long-term effects of this type of anxiety. Proper study habits and pre-test preparation were suggested, including getting a good night's sleep prior to the test, distributed study periods, a good diet, taking good notes in class, keeping up with the reading assignments, and highlighting important parts of the textbook. A list of prompts used by the therapists is included in Appendix G. The same assessment devices were administered to the subjects in this condition as in the two experimental conditions. The maximally effective treatment will be offered this group after the 8-month follow-up data are obtained.

Waiting list control (WLC). The waiting list control group consisted of 12 randomly selected subjects who were offered the maximally effective treatment after the data had been collected at the 3-week follow-up. This group was included to assess the extent of improvement due to spontaneous remissions, expectancy of future treatment, and the assessment procedures. The format for this condition is provided in Appendix H. It was followed verbatim. These subjects were seen twice by the therapists, corresponding to the first and third treatment sessions with the experimental subjects.

Dependent Variables

The first dependent variable used in this study was the Test Anxiety Scale (TAS; Sarason, 1972). This scale is made up of 37 items, balanced for acquiescent set responding, which are designed to tap unusual levels of test anxiety. This scale takes about 5 minutes to administer and score. It was used as a screening device to choose the highest test anxious students in the introductory psychology classes. The lowest score included is 23 points or 62.16% of the total possible points, determined by adding a point for each answer determined by Sarason to tap high test anxiety. The score received during the screening process was used as the pre-treatment score, and the post-treatment score was obtained by re-administration during the final session. A sample copy of the TAS is given as Appendix I.

The second dependent variable used in this study was the state anxiety portion of the State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lushene, 1970). It is comprised of 20 items to which one of four possible replies is available to the subjects, either "almost never," "often," and "almost always." Scores are assigned to each of these alternatives. This self-evaluation questionnaire requires about 3 minutes to administer and 2 minutes to score. A sample of the State Anxiety scale is given in Appendix B. The instructions state that the subject is to respond to the statements as they feel at the immediate present, which follows from the definition of a state anxiety. This portion of the STAI is designed so that the researcher can designate a particular situation in order to focus the subjects' attention to his or her anxiety

in that specific situation. Therefore, the subjects were asked to reply to the statements on form X-1 as if they were confronting the test taking setting. The statements would then be amended to read, for instance, "I feel calm (in the test taking situation)," or "I feel secure (in the test taking situation)," etc. The scores can range from a minimum of 20 to a maximum of 80 points. Means, standard deviations, and alpha levels are shown in Appendix J.

The third dependent variable was included to measure trait anxiety levels in the subjects. This was done by the Trait portion of the STAI. This portion of the STAI includes 20 items designed to tap general anxiety independent of specific situations. A copy of the Trait Anxiety scale is included in Appendix A (STAI Form X-2). Controls for set responding are built into both this and the State Anxiety Scales. There are 80 possible points, corresponding to high trait anxiety levels, from a minimum of 20 points (low level of self-evaluated trait anxiety) to a maximum of 80 points, corresponding to high trait anxiety levels. The criterion level on the State-Trait Anxiety Inventory for inclusion in this experiment was irrelevant to this study since subjects were chosen for their scores on the test anxiety scale (TAS) only.

The Fear Survey Schedule (FSS-III) taken from Wolpe and Lang (Thomas, 1974) was the fourth dependent variable. It is a survey of 76 objects, experiences, and items one might confront in his or her environment. The subject is to check each item under the appropriate column headed either "not at all," "a little," "a fair amount," "much," or "very much" depending on how much each item causes fear or other unpleasant feelings. The

FSS-III was scored by assigning either 0, 1, 2, 3, or 4 points to the columns, with increasing magnitude with increasing fear. Scores could range, then, from 0 to 304 points. The FSS-III was used in this study to assess the amount of state anxiety, since the total survey is made up of 76 stimuli which could describe 76 separate "states" in which one could experience anxiety. Combining these items makes for a good index of generalized state anxiety. The FSS-III was administered at the first and third sessions and again at the 3-week follow-up. A sample is provided in Appendix K.

A test anxiety verbal rating sheet was included in Appendix L as the fifth dependent measure. This sheet was picked up in class and filled out during the first psychology test after treatment was concluded to ascertain immediate levels of test anxiety and relative changes in test anxiety. The items include statements designed to measure any differences between pre- and post-treatment levels of test taking anxiety. The same four alternatives that were used in the two STAI self-evaluation questionnaires were provided (not at all, somewhat, moderately so, and very much so). Also included on this form was a question designed to assess the level of test anxiety while taking the actual test.

The final dependent variable to be considered was actual test performance, included to provide a test for ecological validity of the treatment procedures. After the screening procedures were completed, the subjects selected had their first two psychology exam scores (using z-scores) averaged and this average was compared to the average of the two post-treatment test scores by means of difference scores.

Experimenter/Therapist

The author served as one of the two therapists in the study. This graduate student in Clinical/Experimental Psychology at the University of North Carolina at Greensboro is a 23-year-old male who was familiar with the procedure from pilot work on four adults with assorted moderate levels of anxiety in different situations. The other therapist, an 18-year-old female, undergraduate psychology major at the University of North Carolina at Greensboro was trained by the experimenter in the stress inoculation training procedure. This training involved practice before the experiment on several students at the same institution. The undergraduate experimenter saw five subjects in the General Stress Inoculation Training, Discussion Control, and Waiting List Control groups, and three subjects in the Test-Specific Stress Inoculation Training group.

Statistical Analysis

A multivariate analysis of variance was run on four of the dependent variables--the TAS, the two portions of the STAI, and the FSS-III--to determine equivalence of the four conditions on the pre-treatment scores. The post-treatment scores on these four variables were then subtracted from the pre-treatment scores for each individual, and a multivariate analysis of variance was conducted on these difference scores. The Scheffé post hoc test for paired comparisons was calculated on the canonical variable according to the criterion established by Harris (1975, p. 104), and Pillai's trace was chosen as the MANOVA criterion in the analysis. The results of the univariates for each of the four

dependent variables are also reported with the corresponding Scheffé post hoc tests when the univariates were significant.

One-way analyses of variance were conducted on the two sections of the verbal rating scale and the test score differences along with the Scheffé post hoc tests on the significant results. All alpha levels are reported.

Multivariate analyses of variance were also conducted on the follow-up versus pre-treatment and follow-up versus post-treatment difference scores for the TAS, STAI, and the FSS-III along with the Scheffé post hoc comparisons when significant results were obtained.

CHAPTER III

RESULTS

Pre-Treatment

Although the 48 subjects were randomly assigned to one of the four conditions, a multivariate analysis of variance was conducted on the TAS, STAI, and FSS-III pre-treatment scores to insure initial equivalence prior to the treatment. The pre-treatment means for each of the four groups and each of the four dependent variables are presented in Table 1. The MANOVA results, using Pillai's trace, verified the equivalence between the groups, F (12, 129) = 0.655, $p < 0.792$.

Pre-Treatment to Post-Treatment Differences

Change scores for TAS, FSS-III, and the two portions of the STAI scores were analyzed using a multivariate analysis of variance. The analysis yielded a significant difference between the four groups on the canonical variate at the 0.0001 alpha level. Pillai's trace resulted in an F value of 4.256 (12, 129). Post hoc paired comparisons using the Scheffé test according to the criterion in Harris (1975, p. 104) showed that the group receiving test-specific stress inoculation training differed significantly from both of the two control groups. There were no significant differences between those individuals receiving test-specific stress inoculation training and those who were trained with the more generalized coping statements, or those in this general stress inoculation group from either of the two control groups.

Table 1

Pre-Treatment Means

Treatment Condition	TAS	SAI	TAI	FSS
Test-Specific Stress Inoculation Training	28.583	65.083	47.000	112.833
Generalized Stress Inoculation Training	26.750	60.000	41.083	103.167
Discussion Control	27.417	60.167	41.333	112.917
Waiting List Control	27.250	61.250	45.250	117.083

The mean changes for each of these four dependent variables are presented in Table 2. The univariate analyses showed that all dependent variables, except the FSS-III, yielded differences between the groups with regard to improvement in anxiety reduction. The analysis of variance summary tables are provided in Appendix M. The three significant univariates rejected the null hypotheses ($p < 0.0001$, $p < 0.0001$, $p < 0.0083$) for the TAS, SAI, and TAI, respectively. Scheffé's post hoc test revealed that reduction in anxiety levels differed significantly ($p < 0.001$) between the test-specific group and the two control groups and between the general stress inoculation group and the waiting list control group on the Test Anxiety Scale. There were no significant differences between the two types of stress inoculation training, nor between the General Stress Inoculation and the Discussion Control groups. The differences between the two control groups was also not significant. The utility index, computed with the main effect fixed from the computational formula derived by Gaebelein and Soderquist (1974, p. 10), showed that 52.2% of the variance was accounted for by the main effect, the treatment condition.

The Scheffé post hoc analysis indicated, for the State portion of the STAI, that those receiving the stress inoculation training had their test anxiety reduced to a significantly greater extent ($p < 0.005$) than the two control groups. The two treatment conditions did not differ significantly, nor did the two control groups from one another. At the alpha level of 0.001, the General Stress Inoculation Training versus Discussion Control difference was no longer evident, however. On the State

Table 2

Mean Changes Between Pre- and Post-Treatment

Treatment Condition	TAS	SAI	TAI	FSS
Test-Specific Stress Inoculation Training	16.000	29.167	7.750	15.083
Generalized Stress Inoculation Training	11.583	19.667	7.750	32.000
Discussion Control	6.000	5.250	2.583	35.500
Waiting List Control	0.000	1.083	-0.083	12.500

portion of the STAI, designed in this experiment to measure test anxiety, the treatment accounted for 61.7% of the total variance.

On the Trait portion of the STAI, for which there was a significant overall treatment effect ($p < 0.0083$), the Scheffé post hoc comparisons showed no significant differences between the conditions at the 0.001 or 0.005 alpha levels. However, at the 0.05 probability level, both experimental conditions, the Test-Specific Stress Inoculation Training and the General Stress Inoculation Training groups, showed reduced trait anxiety levels compared to the waiting list control group. There were no differences between these two groups, nor between the two control groups or the DC group and the two experimental groups. Computation of the utility index indicated that the treatment assigned was responsible for 17.7% of the total variance.

The differences between groups on the FSS-III were not significant All of the changes on the dependent measures indicated significant reductions in anxiety for both experimental conditions ($p < 0.05$) and the change on the FSS-III for the Discussion Control group reflected a significant change at the same probability level.

Verbal Rating Scale

The verbal rating scale, a sample of which is shown in Appendix L, is designed to assess the subject's subjective evaluation of his or her test anxiety after treatment as opposed to it before the treatment was introduced. It was divided into two sections for ease of analysis, since the first five statements are based on a 4-point scale and the last question ("Half-way through the test my anxiety was...") allows five alternative

responses. A one-way analysis of variance, with the main effect fixed, conducted on the mean individual responses to the first five statements, showed that the groups differed significantly, $\underline{F}$ (3, 44) = 17.654, $\underline{p} < 0.0001$, with regard to their subjective view of changes in anxiety. The mean responses are given in the first portion of Table 3. The Scheffé post hoc test revealed that the group receiving the test-specific stress inoculation training felt that their test anxiety was significantly lower (0.001) than those individuals in either the Discussion Control or Waiting List Control groups. Those receiving the more generalized approach showed greater improvement than did the Waiting List Control, but no significant difference between this group and the Discussion Control group was found. There was no difference between the two stress inoculation approaches nor the two control groups. The utility index was 51.0%, this indicating that the type of treatment received accounted for 51% of the total variance on the first section of the Verbal Rating Scale.

The second portion of the rating scale was designed to tap actual test anxiety during the performance of an examination. The mean responses are shown in the second portion of Table 3. The four groups differed significantly on their responses to this statement, $\underline{F}$ (3, 44) = 8.032, $\underline{p} < 0.0004$. The post hoc test showed that at $\underline{p} < 0.001$ only the test-specific group differed significantly from the Waiting List Control, indicating that their anxiety level during the psychology examination was significantly less than this control group. At the 0.05 probability level, however, a significant difference emerged between the Test-Specific Stress Inoculation Training individuals and the other control group, the

Table 3

Verbal Rating Scale Results

A. First Portion

Condition	N	Mean Rating Response
TSIT	12	3.317
GSIT	12	2.850
DC	12	2.467
WLC	12	1.967

F value = 17.654; df = 3, 44; $p < 0.0001$

B. Second Portion

Condition	N	Mean Rating Response
TSIT	12	1.917
GSIT	12	2.250
DC	12	2.667
WLC	12	3.333

F value = 8.032; df = 3, 44; $p < 0.0004$

Discussion Control group. There were no significant differences between the General Stress Inoculation Training individuals and the two control groups, nor between the two stress inoculation training groups. The treatment factor accounted for 30.5% of the total variance. The results indicated that those individuals who received the test-specific coping statements reduced their subjective feelings of test anxiety during the actual test significantly more than those individuals in either control group. A space for additional comments was provided on the verbal rating sheet, and all of these comments are given in Appendix N.

Test Score Differences

The final variable used to assess post-treatment differences was the change in actual test performance between the average of the two psychology tests taken before treatment and the average of the two test grades after the completion of the treatment. These test grades, shown in Table 4, were transformed into z-scores. The results of the one-way univariate analysis indicated that the differences between the groups were not significant, F (3, 44) = 0.511, $p < 0.681$. Therefore, the treatment did not result in an increase in test performance. A utility index was not calculated since the resulting value would be negative. Post hoc comparisons were not made since the ANOVA results were non-significant.

Pre-Treatment to Follow-Up Differences

A 3-week follow-up was conducted using the TAS, the State and Trait portions of the STAI, and the FSS-III. Difference scores on these four

Table 4

Test Score Differences Pre- to Post-Treatment

(In Z-Score Units)

Subject	TSIT	GSIT	DC	WLC
1	0.553	0.485	-0.293	-0.038
2	-0.203	-0.622	-0.006	-0.043
3	-2.480	-0.245	0.295	0.095
4	-0.403	0.833	0.402	-1.260
5	0.074	-0.350	0.672	-0.660
6	0.705	-1.660	-0.425	-0.432
7	0.504	0.599	0.341	-0.604
8	0.286	-0.182	0.113	0.326
9	0.502	0.728	0.060	0.349
10	0.030	0.275	0.470	-0.312
11	0.079	0.371	0.289	0.414
12	-0.023	0.705	-0.375	0.165
Means	-0.031	0.078	0.129	-0.167

The F value for the univariate is 0.51131, $p < 0.6806$

dependent variables were calculated between the pre-treatment scores and the results from the the 3-week follow-up to insure that the improvements were still existant and to assess any changes that might have accrued with time or exposure since the termination of treatment. The mean differences are presented in Table 5 and Figure 1. Due to the inaccessibility of the subjects, only 10 subjects per group were included in this analysis. A multivariate analysis of variance conducted on the data revealed a significant treatment effect, approximate F (12, 105) = 2.673, $p < 0.0038$. The means of the canonical variate, 0.482 (Test-Specific Stress Inoculation Training), 0.436 (General Stress Inoculation Training), 0.162 (Discussion Control) and -0.005 (Waiting List Control), were compared using the Scheffé post hoc test, and significant differences were not evident. Therefore, it is only safe to assume that, although there is a difference between these groups, this difference cannot be isolated.

Only two of the univariates on the dependent variables yielded significant results. The differences in responding on the TAS held up through the 3-week follow-up. All groups had some reduction in test anxiety as measured by the TAS, but there were differences between groups in the amount of this reduction, F (3, 36) = 15.307, $p < 0.0001$. The Scheffé post hoc test showed that the superiority of the Test-Specific Stress Inoculation Training group over the two control groups was maintained at $p < 0.05$, as was the difference between the General Stress Inoculation Training and the Waiting List Control group. However, at $p < 0.005$, the superiority of the Test-Specific Stress Inoculation Training over the Discussion Control group disappeared. There were no

Table 5

Mean Difference Scores

Condition		TAS	SAI	TAI	FSS-III
TSIT	Post-Pre[a]	16.000	29.167	7.750	15.083
	Fol-Up-Pre	16.500	24.500	8.200	30.100
	Fol-Up-Post	0.000	-4.700	0.200	7.100
GSIT	Post-Pre	11.583	19.667	7.750	32.000
	Fol-Up-Pre	13.800	24.600	5.400	28.200
	Fol-Up-Post	1.200	2.300	-2.800	-7.200
DC	Post-Pre	6.000	5.250	2.583	35.500
	Fol-Up-Pre	6.400	8.600	3.600	22.100
	Fol-Up-Post	1.900	3.200	0.700	12.100
WLC	Post-Pre	0.000	1.083	-0.083	12.500
	Fol-Up-Pre	0.200	1.400	0.900	13.400
	Fol-Up-Post	1.100	1.400	0.800	5.700

Note. Positive values indicate a reduction in anxiety, a negative value indicates an elevation in anxiety.

[a]The Post-Pre difference is computed with N = 12; the two follow-up differences are computed with N = 10.

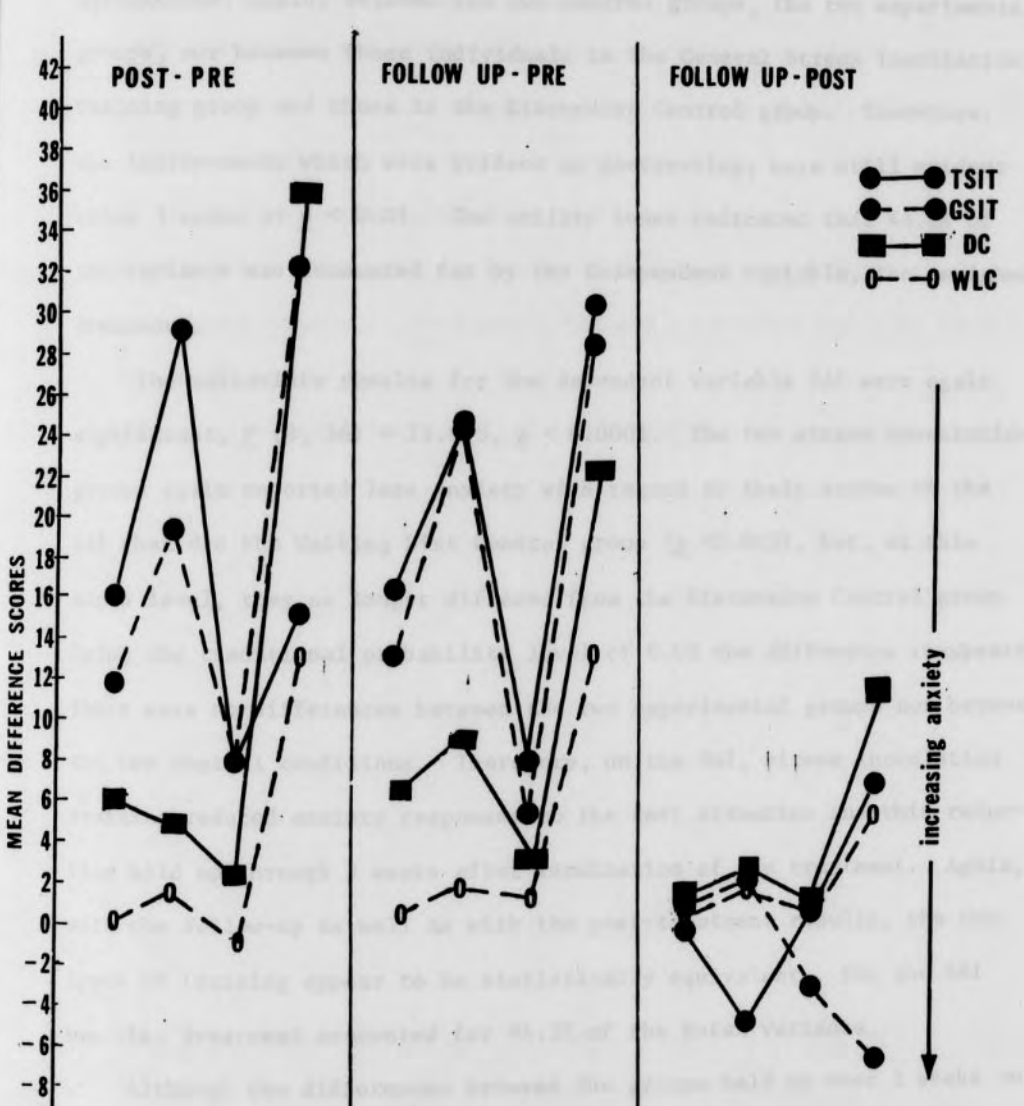

Figure 1. Mean difference scores for each group on each dependent measure.

differences, again, between the two control groups, the two experimental groups, nor between those individuals in the General Stress Inoculation Training group and those in the Discussion Control group. Therefore, the improvements which were evident at posttesting, were still evident after 3 weeks at $p < 0.05$. The utility index indicated that 44.1% of the variance was accounted for by the independent variable, the assigned treatment.

The univariate results for the dependent variable SAI were again significant, F (3, 36) = 11.695, $p < 0.0001$. The two stress inoculation groups again reported less anxiety with regard to their scores on the SAI than did the Waiting List Control group ($p < 0.005$), but, at this alpha level, they no longer differed from the Discussion Control group. Using the traditional probability level of 0.05 the difference reappears. There were no differences between the two experimental groups nor between the two control conditions. Therefore, on the SAI, stress inoculation training reduced anxiety responses to the test situation and this reduction held up through 3 weeks after termination of the treatment. Again, with the follow-up as well as with the post-treatment results, the two types of training appear to be statistically equivalent. For the SAI results, treatment accounted for 44.5% of the total variance.

Although the differences between the groups held up over 3 weeks on the TAI, the trend was no longer significant, F (3, 36) = 2.095, $p < 0.117$. The FSS-III again did not differentiate between the treatment conditions.

Post-Treatment to Follow-Up Differences

The results of the MANOVA indicated no differences between the groups over the 3-week span after the final session, F (12, 105) = 1.175, $p < 0.310$. The univariates were also non-significant. Therefore, as far as the four dependent variables used in this study, little change occurred, either positively or negatively, between the follow-up and the last treatment session. The mean difference scores are given in Table 5 and appear in Figure 1.

There appeared no differential responding due to sex differences.

CHAPTER IV

DISCUSSION

The results of this study indicate that stress inoculation training is effective in reducing test anxiety and that this reduction continued even 3 weeks after the termination of treatment. However, as hypothesized, it does not appear that the two types of stress inoculation training work equally well with test anxiety. If the TAS and SAI are used as measures of test anxiety, there is no statistical difference between the generalized approach and the test-specific approach; however, the Test-Specific Stress Inoculation Training group did consistently better and only they had their test anxiety reduced more than the Discussion Control individuals at highly significant levels. Since the hypothesis that those individuals trained under the generalized condition should have their trait anxiety scores lowered more than those trained under the test-specific condition was not confirmed, it would be fairly accurate to state that, when a clinician is presented with a situation-specific anxiety, he should treat it with situation-specific coping statements. Some generalizations will result to reduce overall anxiety (trait anxiety). This approach would be preferable to training with generalized coping statements or simple discussions about study habits. Tests and preparation for tests may be such pervasive elements in the daily life of undergraduates that, by reducing test anxiety, a concomitant reduction in trait anxiety would occur simply because the general arousal level is

made up of predominantly test-type cognitions. Because there was no reduction in state anxiety as measured by the FSS-III, these diversified states may have to be attacked individually or at least in common groups. In general, then, there is no benefit of generalization by using General Stress Inoculation Training instead of a situation-specific approach.

Generalized stress inoculation training did not reduce subjective ratings of test anxiety during an actual test any more than did the discussions between the therapists and the subjects. However, stress inoculation training using test-specific coping statements reduced subjective feelings of anxiety more than either control condition. This finding is further support for a specific training technique for test anxiety reduction rather than a generalized approach. Although there were no significant differences between the experimental groups, Test-Specific Stress Inoculation Training tended to be superior. Since the correlations between the dependent variables were only moderate (see Appendix O), the continual superiority of the Test-Specific Stress Inoculation Training group over the General Stress Inoculation Training group further supports test-specific training as the method of choice. Since the General Stress Inoculation Training involved exposure to an imaginal test situation, the nature of the coping statements seems to be the relevant component.

As touched on above, the reason that there were no significant differences between the groups on the FSS-III, or that the multivariate was made up of so little of this factor (-0.011), might be the wide range of situations sampled by the Fear Survey Schedule. The correlation between scores on the FSS-III and the TAS was only 8.8%. Although there is an

extension of the therapeutic effects of stress inoculation to general, day to day anxiety (trait anxiety), there appears little generality to non-related specific situations that one might encounter day to day. Since the college students' day typically involves test taking, studying for tests, awaiting grades on previously taken tests, and other forms of evaluation, overall anxiety could be reduced when test anxiety is lowered without a concurrent reduction in other specific areas. It may be too that the lack of exposure to many of the objects and items on the FSS-III at the post-treatment assessment prevented the third stage of stress inoculation training, the exposure phase, from ever occurring in vivo. Therefore, one of the main components of this technique never took place.

The fact that the groups did not differ in actual test performance before and after treatment, even though they differed on self-reports during the test immediately following the treatment, is disappointing but interesting. In view of the self-report data, one might have expected similar results involving actual test grade improvement. However, those individuals who received stress inoculation training (particularly Test-Specific Stress Inoculation Training) showed no better improvement in test results than the control subjects even though they reported less anxiety. This is consistent with recent findings by Pinton (1976) and Bedell (1976). It seems that they were less anxious but that this reduction in anxiety was offset by other factors. Because of the many variables involved in test performance, such as content mastery, preparation, level of fatigue, interest in the area to be included on the test, and motivation to please the teacher (introductory psychology is team taught),

it is not surprising that the manipulation of one variable, the anxiety level, did not result in a difference in performance. The clinician must be satisfied with reductions in self-reported anxiety and anxiety on paper-and-pencil assessment devices, such as the TAS, and the STAI, a significant accomplishment in itself. The reduction of anxiety may eliminate somatic complaints, avoidance responses, and inefficient study habits.

The results from the 3-week follow-up indicated that the improvements since pre-treatment levels held up for the stress inoculation training recipients on two of the four variables. These were the TAS and the SAI, both used to measure test anxiety. The superiority of the stress inoculation training recipients did not continue on the trait measure (TAI), relative to the Waiting List Control. Since the follow-up was conducted during the final week of classes of the semester, it might be that the rush to complete projects and papers caused the level of overall anxiety to return to pre-treatment levels. The lack of differences due to the assigned conditions between the follow-up and post-treatment assessments shows that the superiority of those subjects trained under the stress inoculation program was unchanged and that the 3 weeks following treatment neither caused any further improvement nor any loss in improvement, differentially. If there were large increases in anxiety-type responses from the last treatment session to the 3-week follow-up, one might be cautious in embracing a treatment previously judged effective due to post-treatment improvements. It might indicate the need for booster sessions and research concerning most effective

spacing of booster sessions. In the case of stress inoculation training which has appeared effective so far, at least compared to the controls employed in this study, a need for repetition of the coping statements or the adoption of statements other than the ones practiced in the therapy sessions might be indicated. On the other hand, further reduction of anxiety levels beyond those achieved at the post-treatment assessment might indicate that increasing familiarity with the coping statements has facilitated anxiety reduction even more. If decreases in trait and state anxiety occur between the follow-up and the final treatment session, it might indicate that stress inoculation training is bolstered by expanding confrontation with previously anxiety provoking situations.

Stress inoculation training, one form of cognitive behavior modification, was found to reduce test anxiety and trait anxiety. Why this method works is not made explicit in this study, although the data suggest that the nature of the coping statements learned by the subject may be the critical variable. The lack of consistent superiority of the General Stress Inoculation Training individuals over the Discussion Control individuals is another interesting result of this study. Tighter controls on the content covered in the Discussion Control group is needed to insure that no general cognitive restructuring is taking place.

Future research efforts should be aimed at the possible explanations for the effectiveness of stress inoculation training. Three alternatives to consider are cognitive restructuring, extinction, and response competition. Also, other test anxious populations could be used since subject

bias exists in the sampling of college students. Extremely test-anxious subjects would probably not have made it to college due to poor high school grades or due to their avoidance of a highly anxiety-producing situation.

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Appendix A

Trait Anxiety Inventory

Self-Evaluation Questionnaire--STAI Form X-2
Developed by C. D. Spielberger, R. L. Gorsuch and R. Lushene

Name _____ Date _____

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

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

Appendix B

State Anxiety Inventory

Self-Evaluation Questionnaire--STAI Form X-1
Developed by C. D. Spielberger, R. L. Gorsuch and R. Lushene

Name _____ Date _____

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

	Not At All	Some-what	Moderately So	Very Much So
1. I feel calm	1	2	3	4
2. I feel secure	1	2	3	4
3. I am tense.	1	2	3	4
4. I am regretful.	1	2	3	4
5. I feel at ease.	1	2	3	4
6. I feel upset.	1	2	3	4
7. I am presently worrying over possible misfortunes.	1	2	3	4
8. I feel rested	1	2	3	4
9. I feel anxious.	1	2	3	4
10. I feel comfortable.	1	2	3	4
11. I feel self-confident	1	2	3	4
12. I feel nervous.	1	2	3	4
13. I am jittery.	1	2	3	4
14. I feel "high strung".	1	2	3	4
15. I am relaxed.	1	2	3	4
16. I feel content.	1	2	3	4
17. I am worried.	1	2	3	4
18. I feel over-excited and "rattled"	1	2	3	4
19. I feel joyful	1	2	3	4
20. I feel pleasant	1	2	3	4

Appendix C

Format for Stress Inoculation Training

You have been randomly selected for this study because of your relatively high score on the test anxiety scale which you took in your psychology class. Since you have made it this far in school and have taken countless numbers of tests, quizzes and examinations, it is unlikely that your feelings of anxiety in the test situation are terribly debilitating, but I'm sure that it bothers you and detracts from your overall performance on tests. Almost everyone suffers a little anxiety just before a major test, but the real problem is when that anxiety reaches high enough levels to interfere with your performance or preparation for a test. Or when the anxiety generalizes to the classroom or to any type of situation where you are subject to evaluation (public speaking, term papers, oral reports, etc.). In order to minimize your test-taking anxiety you have been randomly selected to receive a particularly effective treatment. All that it requires is about 2½ hours of your time, including today's session, and two follow-up assessments in 3 weeks and 8 months.

The technique we will be using is called stress inoculation training, which is a relatively new technique developed by a gentleman from the University of Waterloo in Canada. It involves taking some of the negative things that you are probably saying to yourself in the testing situation and replacing these negative statements with more positive statements. We have a list of these statements which we will give you to keep and rehearse at least once a day. Beginning with our next

session, a week from today, you and I will try to get at the negative statements that you might be saying to yourself now, and pick from this list, more positive statements that should help you manage the anxiety present while taking a test. The following week, your final treatment session, will involve rehearsing these statements to yourself while imagining the testing situation as well as possible. I will try to re-create the feeling of taking a test, the room, where the blackboard is, all the people sitting around you, actually receiving your test from the professor, and so on. You will then covertly rehearse the statements which you have picked to deal with any arousal you might feel while imagining this situation. This exposure to the stressful situation while using these new coping skills should help you to feel less anxious when actually confronted with a real test.

Before we start talking about your negative statements, are there any questions about the procedure or your responsibilities in this experiment? Good, then why don't you just sit back and relax; remove any binding jewelry, shoes, clothes, etc., and get comfortable. One more thing, please do not discuss your participation in this experiment with anyone else nor encourage another subject to talk to you about his or her treatment. All right? Let's begin.

Appendix D

Test-Specific Stress Inoculation Statements

1. Preparing for Test Anxiety
   - -I know I'm well prepared for this test, so just relax.
   - -Before I look at the first questions, take a deep breath.
   - -I am very confident about getting a B, so take a little extra time and try for an A.
   - -I don't care what others are doing around me. I know this material as well as they do, maybe better.
   - -Remember to take one question at a time. Give myself a chance.
   - -Don't panic if I don't recognize the first question. I can always come back to it once I get started.
   - -It might be a little difficult, but I believe in myself.

2. Confronting and Handling Test Anxiety
   - -Don't think about being overwhelmed; just think about what I have to do, keep my mind on the test, nothing else.
   - -A little test anxiety is natural and it's a reminder to use my coping skills.
   - -If I'm not sure of several questions in a row, don't panic, but sit back for a moment and take a few deep breaths and relax.
   - -Get right in there, don't look around the room. Tests can be enjoyable when I feel confident about the material.
   - -The test is a challenge, nothing to get worked up over.
   - -I knew the material well last night so it'll come, just give it a chance.
   - -Drawing a blank is perfectly natural; just move along and come back later.

3. Coping with the Feeling of Being Overwhelmed
   - -When I feel anxiety coming on, just pause and try to concentrate on my paper.
   - -Don't let my mind wander to dispel the anxiety, I should channel the arousal more constructively in my work.
   - -Label my test anxiety from 0 to 10 and objectively watch it change.
   - -Since the test covers so much material, I'm bound not to know everything for sure. Just answer each item the best I can.
   - -Don't try to eliminate the anxiety totally; it's good to be somewhat aroused if it's kept at a manageable leve.
   - -My muscles are starting to tense up. Time to relax and slow things down. I have plenty of time.
   - -Now that I'm in control of my anxiety, I can't panic.
   - -The professor is not out to get me, I'll show him (her) just how well I can do.

4. Reinforcing Self-Statements

-Well, I'm finished; I didn't even panic and I did well.
-I channeled my arousal in the proper direction, congratulations.
-I knew the material and it will show up in my grade.
-That wasn't so bad; I've got control from now on.
-I can be real pleased with the progress I'm making.
-Terrific! My test performance reflects my knowledge now.
-My confidence wasn't even shaken when others turned in their papers before I was finished.
-I handled that test pretty well. Now I can almost look forward to the next one.
-Now I see that there isn't anything to get so upset about.

Appendix E

Generalized Stress Inoculation Statements
(From Meichenbaum & Turk, 1975)

1. Preparing for a Stressor
   -What is it I have to do?
   -I can develop a plan to deal with it.
   -Just think about what I can do about it. That's better than getting anxious.
   -No negative self-statements; just think rationally.
   -Don't worry; worry won't help anything.
   -Maybe what I think is anxiety is eagerness to confront it.
   -Time for a few deep breaths of relaxation. Feel comfortable, relaxed and at ease.
   -This could be a testy situation, but I believe in myself.
   -I have lots of different strategies I can call upon.

2. Confronting and Handling a Stressor
   -One step at a time; I can handle the situation.
   -Don't think about fear; just think about what I have to do and stay relevant.
   -This anxiety is what the experimenter said I would feel. It's a reminder to use my coping exercises.
   -Relax; I'm in control. Take a slow deep breath. Ah, good.
   -Dont' get all bent out of shape; just think of what to do here.
   -I don't need to prove myself.
   -Don't assume the worst or jump to conclusions. Look for the positives.
   -I can meet the challenge.

3. Coping with the Feeling of Being Overwhelmed
   -When fear comes, just pause.
   -Keep the focus on the present; what is it I have to do?
   -Label my fear from 0 to 10 and watch it change.
   -I should expect my fear to rise.
   -Don't try to eliminate fear totally; just keep it manageable.
   -It's not the worst thing that can happen.
   -Do something that will prevent myself from thinking about fear.
   -Describe what is around me. That way I won't think about worrying.
   -My muscles are starting to feel tight. Time to relax and slow things down.
   -When the anxiety mounts I can switch to a different strategy; I'm in control.

4. Reinforcing Self-Statements
-It worked; I did it.
-I made more out of the anxiety than it was worth.
-My damn ideas--that's the problem. When I control them, I control my fear.
-It's getting better each time I use the procedures.
-I can be pleased with the progress I'm making.
-Guess I've been getting upset for too long when it wasn't even necessary.
-I handled it pretty well.

Appendix F

Format for Discussion Control

You have been randomly selected for this study because of your relatively high score on the test anxiety scale which you took in your psychology class. Since you have made it this far in school and have taken countless numbers of tests, quizzes and examinations, it is unlikely that your feeling of anxiety in the test situation is terribly debilitating, but I'm sure it bothers you and detracts from your overall performance on tests. Almost everyone suffers a little anxiety just before a major test, but the real problem is when that anxiety reaches high enough levels to interfere with your performance or preparation for a test. Or when you begin to get anxious several days in advance of a test, or when the anxiety generalizes to the classroom or to any type of situation where you are subject to evaluation (public speaking, term papers, oral reports, etc.). In order to minimize your test-taking anxiety you have been randomly selected to receive a particularly effective treatment. All that it requires is about 2½ hours of your time, including today's meeting, and two follow-up assessments in 3 weeks and 6 months.

Very simply, we will spend the remainder of this session and the next two sessions discussing your actual feelings during your preparation for a test, and your thoughts and feelings after the completion of a test and while you await your grade. We'll try to analyze these feelings and, together, try to achieve some insight into the dimensions of your test anxiety. This will help you to understand yourself better and place you more in control of the situation rather than the situation

being in control over you, as it has been in the past. If you can objectively analyze your anxiety with an outsider, the anxiety in subsequent examination settings should be more easily dealt with. Thus, you will come to realize that a test does not really represent a personal affront nor does it reflect anything about you as a person. We shall put test-taking in its proper perspective and this should create less of an anxiety-provoking experience. Perhaps we could chat about your subjective feelings of anxiety when confronted with an unexpected examination or quiz. It might help to discuss what some of your close friends feel in the same situation, to study vicariously test anxiety in others. In general, I am here to help you talk through all of the feelings, thoughts and attitudes you experience when contemplating an upcoming test. We can explore some of your study habits and interpersonal relationships bearing on your test performance. In this and the remaining two sessions, the therapy will progress into any relevant areas which you may wish to pursue. The good thing about this particular treatment approach is that it is very flexible since it is adaptable to your particular thoughts and feelings. Therefore, it is designed to get at your individual problem, and hence, it should be more successful in modifying <u>your</u> test anxiety than a more rigid and global approach.

Before we start talking about your particular feelings and ideas, are there any questions as to the procedure or your responsibilities in this experiment? Good, then why don't you just sit back and relax; remove any binding jewelry, shoes, clothes, etc., and let's discuss the problem.

Appendix G

Prompts for Discussion Control

What do you do the day of an examination?

Where and when do you do most of your studying?

Do you study alone?

How do your friends prepare for tests? Is their attitude different from yours?

How long have you experienced test-taking anxiety?

Let's talk a little about how you feel when a test is being handed back.

Has test anxiety ever caused you any interpersonal problems?

Has an upcoming test interfered with your eating and/or sleeping?

Have other members of your family complained of high test anxiety at any time in their lives?

Do you think your grades have suffered due to your test anxiety?

Do you draw a blank if you don't know the first few questions on a test?

What courses have created the most (least) test anxiety?

Do you experience a lot of anxiety when on a plane, around hospitals, at the dentists, etc.?

Appendix H

Format for Waiting List Control

You have been randomly selected for this study because of your relatively high score on the test anxiety scale which you took in your psychology class. Since you have made it this far in school and have taken countless numbers of tests, quizzes and examinations, it is unlikely that your feelings of anxiety in the test situation is terribly debilitating, but I'm sure that it bothers you and detracts from your overall performance on tests. Almost everyone suffers a little anxiety just before a major test, but the real problem is when that anxiety reaches high enough levels to interfere with your performance or preparation for a test. Or when the anxiety generalizes to the classroom or to any type of situation where you are subject to evaluation (public speaking, term papers, oral reports, etc.). In order to minimize your test-taking anxiety you have been randomly selected to receive a particularly effective treatment. All that it requires is about 2½ hours of your time, including today's session, and one follow-up assessment in 3 weeks.

Since test anxiety is so prevalent here at UNC-G as it is at most colleges, we have a large number of students to treat. Therefore, it will be about 3 weeks before you are to start your treatment. You will be contacted then, and an appointment will be set up for you to fill out more of the same forms, and we will set up the first treatment session at that time. Or, you may choose to have your treatment begin early next fall. Until we contact you in about 3 weeks, if you have any questions about your responsibilities or requirements of your psychology

credit, please call me by way of the Psychology Department or at my home at 272-4473. Please do not discuss your participation in this study with anyone else nor encourage other subjects to discuss their participation in this study. Thank you, and we'll be contacting you in several weeks.

Appendix I

Test Anxiety Scale
(Sarason, 1972)

Please place a line through the correct response for each item. Answer every item to the best of your ability. Try to place yourself in the testing situation as vividly as possible to increase the accuracy of your responses. Please answer truthfully, since the results are to be used as a basis for psychological research. The results, of course, are to be confidential.

T F 1. While taking an important exam I find myself thinking of how much brighter the other students are than I am.

T F 2. If I were to take an intelligence test, I would worry a great deal before taking it.

T F 3. If I knew I was going to take an intelligence test, I would feel confident and relaxed, beforehand.

T F 4. While taking an important examination I perspire a great deal.

T F 5. During course examinations I find myself thinking of things unrelated to the actual course material.

T F 6. I get to feel very panicky when I have to take a surprise exam.

T F 7. During tests I find myself thinking of the consequences of failing.

T F 8. After important tests I am frequently so tense that my stomach gets upset.

T F 9. I freeze up on things like intelligence tests and final exams.

T F 10. Getting a good grade on one test doesn't seem to increase my confidence on the second.

T F 11. I sometimes feel my heart beating very fast during important tests.

T F 12. After taking a test I always feel I could have done better than I actually did.

T F 13. I usually get depressed after taking a test.

T F 14. I have an uneasy, upset feeling before taking a final examination.

T F 15. When taking a test my emotional feelings do not interfere with my performance.

T F 16. During a course examination I frequently get so nervous that I forget facts I really know.

T F 17. I seem to defeat myself while working on important tests.

T F 18. The harder I work at taking a test or studying for one, the more confused I get.

T F 19. As soon as an exam is over I try to stop worrying about it, but I just can't.

T F 20. During exams I sometimes wonder if I'll ever get through college.

T F 21. I would rather write a paper than take an examination for my grade in a course.

T F 22. I wish examinations did not bother me so much.

T F 23. I think I could do much better on tests if I could take them alone and not feel pressured by a time limit.

T F 24. Thinking about the grade I may get in a course interferes with my studying and my performance on tests.

T F 25. If examinations could be done away with I think I would actually learn more.

T F 26. On exams I take the attitude, "If I don't know it now there's no point worrying about it."

T F 27. I really don't see why some people get so upset about tests.

T F 28. Thoughts of doing poorly interfere with my performance on tests.

T F 29. I don't study any harder for final exams than for the rest of my course work.

T F 30. Even when I'm well prepared for a test, I feel very anxious about it.

T F 31. I don't enjoy eating before an important test.

T F 32. Before an important examination I find my hands or arms trembling.

T F 33. I seldom feel the need for "cramming" before an exam.

T F 34. The University ought to recognize that some students are more nervous than others about tests and that this affects their performance.

T F 35. It seems to me that examination periods ought not to be made the tense situations which they are.

T F 36. I start feeling very uneasy just before getting a test paper back.

T F 37. I dread courses where the professor has the habit of giving "pop" quizzes.

Name _____

Points _____

Thank you for your cooperation.

Appendix J

STAI Means, Standard Deviations, Alpha Reliabilities and Test-Retest Reliability for College Undergraduates

	Male Undergraduates	Female Undergraduates
A-Trait		
Mean	37.68	38.25
SD	9.69	9.14
Alpha	.90	.89
Test-Retest Reliability		
1 hour	.84	.76
20 days	.86	.76
104 days	.73	.77
A-State		
Mean	36.35	35.12
SD	9.67	9.25
Alpha	.89	.89
Test-Test Reliability		
1 hour	.33	.16
20 days	.54	.27
104 days	.33	.31

Note. Taken from Spielberger, Gorsuch & Lushene, 1970, p. 8.

Appendix K

Fear Survey Schedule (FSS-III)

The items in this questionnaire refer to things and experiences that may cause fear or other unpleasant feelings. Write the number of each item in the column that describes how much you are disturbed by it nowadays.

	Not at all	A little	A fair amount	Much	Very much
1. Noise of vacuum cleaners					
2. Open wounds					
3. Being alone					
4. Being in a strange place					
5. Loud voices					
6. Dead people					
7. Speaking in public					
8. Crossing streets					
9. People who seem insane					
10. Falling					
11. Automobiles					
12. Being teased					
13. Dentists					
14. Thunder					
15. Sirens					
16. Failure					
17. Entering a room where other people are already seated					
18. High places on land					
19. People with deformities					
20. Worms					
21. Imaginary creatures					
22. Receiving injections					
23. Strangers					
24. Bats					
25. Journeys					
a-Train					
b-Bus					
c-Car					
26. Feeling angry					
27. People in authority					
28. Flying insects					
29. Seeing others injected					
30. Sudden noises					
31. Dull weather					
32. Crowds					
33. Large open spaces					
34. Cats					

	Not at all	A little	A fair amount	Much	Very much
35. One person bullying another					
36. Tough looking people					
37. Birds					
38. Sight of deep water					
39. Being watched working					
40. Dead animals					
41. Weapons					
42. Dirt					
43. Crawling insects					
44. Sight of fighting					
45. Ugly people					
46. Fire					
47. Sick people					
48. Dogs					
49. Being criticized					
50. Strange shapes					
51. Being in an elevator					
52. Witnessing surgical operations					
53. Angry people					
54. Mice					
55. Blood					
a-Human					
b-Animal					
56. Parting from friends					
57. Enclosed places					
58. Prospect of a surgical operation					
59. Feeling rejected by others					
60. Airplanes					
61. Medical odors					
62. Feeling disapproved of					
63. Harmless snakes					
64. Cemeteries					
65. Being ignored					
66. Darkness					
67. Premature Heart beats (missing a beat)					
68. a-Nude men					
b-Nude women					
69. Lightning					
70. Doctors					
71. Making mistakes					
72. Looking foolish					

Appendix L

Test Anxiety Verbal Rating

Name _____

Please answer the following questions as truthfully as possible by circling the number of the reply which best expresses your feelings involving test anxiety and the test-taking situation. The numbers represent the following:

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

1. I feel more or less anxious about preparing for and taking tests now than 2 months ago.

1	2	3	4
More			Less

2. The anxiety that I do experience does not last as long now as it did 2 months ago.

1	2	3	4

3. The anxiety that I do experience interfers less with my test performance now than 2 months ago.

1	2	3	4

4. I feel now that I experience lower test anxiety and do better on tests than 2 months ago.

1	2	3	4

5. I find that I can reduce my anxiety in other situations outside of the test-taking situation better now than 2 months ago.

1	2	3	4

Additional comments:

Thank you for your cooperation.

Also: Half-way through the test my anxiety was (please circle):

1	2	3	4	5
Non-Existant	Slight	Moderate	High	Extremely High

Appendix M

Analyses of Variance: Pre to Post Difference Scores

Source	Degrees of Freedom	Sum of Squares	Mean Square	F Value	Prob. Value
Test Anxiety Scale					
Regression	3	1730.563	576.854	18.487	0.0001
Error	44	1372.917	31.203		
State Anxiety Inventory					
Regression	3	6064.417	2021.472	26.762	0.0001
Error	44	3323.500	75.534		
Trait Anxiety Inventory					
Regression	3	549.667	183.222	4.448	0.0083
Error	44	1812.333	41.189		
Fear Survey Schedule					
Regression	3	4893.563	1631.188	0.759	0.5257
Error	44	94506.917	2147.884		

Appendix N

Comments Taken From the Verbal Rating Scale

Whether or not it shows on the test, my ability to cope with anxiety has greatly increased. Thank you! (TSIT)

I learned a lot and benefited from it. Thanks! (GSIT)

I can now calm myself down easier. (DC)

This is the first test situation I've been in since the experiment and I did feel a difference while taking the test. (GSIT)

I still get emotionally strung out a little before the exam for no reason--sweaty hands, complexion problem--it's improving though. (GSIT)

I felt calm. (TSIT)

I can't really judge a "more or less" based on present anxiety as compared to 2 months ago, because it is basically the same. (DC)

I have not yet had any therapy. (WLC)

I studied more for this one and felt good about it until 3 hours before. I got upset over something else, kept trying to study before and during the test felt like I was getting more and more confused. Other tests I have taken since the experiment I have done better on. (GSIT)

Appendix O

Correlation Coefficients Between the Dependent Variables

	TAS	SAI	TAI	FSS
TAS	1.0000	0.2365	0.0526	0.0770
SAI	----	1.0000	0.6023	0.5158
TAI	----	----	1.0000	0.3413
FSS	----	----	----	1.0000

Appendix P

Spielberger's Rationale

Dr. Spielberger has proposed a model describing anxiety in which your test anxiety can be explained. When one comes into contact with an external stimulus which is stressful, he (she) makes a cognitive appraisal of the situation. Two sources of information go into this cognitive appraisal (what you think and say to yourself about the stressor). One is your overall general level of anxiety proneness (A-trait) which differs from one individual to another. The other consists of internal thoughts, feelings, and personal needs.

The final cognitive appraisal leads to your subjective feelings of apprehension (A-state). If this state anxiety is real high, it will override your defense mechanisms, and your behavior (in this case test taking) will be interfered with. What we are trying to do here is alter your negative cognitive appraisal of the test situation by teaching you positive coping skills to use as a defense against excessive arousal.

(From Spielberger, 1972a, p. 43)

Appendix Q

Analyses of Variance: Pre-Treatment Data

Source	Degrees of Freedom	Sum of Squares	Mean Square	F Value	Prob. Value
Test Anxiety Scale					
Regression	3	21.667	7.222	0.872	0.535
Error	44	364.333	8.280		
State Anxiety Inventory					
Regression	3	202.417	67.472	1.126	0.349
Error	44	2636.833	59.928		
Trait Anxiety Inventory					
Regression	3	308.833	102.944	1.193	0.323
Error	44	3795.833	86.269		
Fear Survey Schedule					
Regression	3	1252.833	417.611	0.287	0.836
Error	44	63987.167	1454.254		