COMPARISON OF COUNTERCONDITIONING AND SELF-CONTROL MODELS OF SYSTEMATIC DESENSITIZATION IN TEST ANXIETY REDUCTION AND TREATMENT GENERALIZATION

by

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Abstract

Although a number of empirical studies support the effectiveness of systematic desensitization in anxiety reduction, various theoretical models have been advanced to explain its efficacy. Two such explanations are Wolpe's traditional counterconditioning paradigm and Goldfried's conceptualization of desensitization based on a self-control model. The present study compared the theoretical and procedural differences of these two models. Using test anxiety as a target behavior, an experimental comparison was made between the two models for treatment effectiveness in the reduction of test anxiety and the generalization of anxiety reduction to general and nontargeted anxieties. Test-anxious university students were assigned to one of three conditions: counterconditioning desensitization, self-control desensitization, and a delayed-treatment control. The effectiveness of each treatment condition was assessed by four measures of test anxiety (two self-report and two performance measures) and one self-report measure for both general and nontargeted anxieties. The results showed that both counterconditioning and self-control

desensitization were more effective in reducing self-report test anxiety and nontargeted anxieties than the control condition. The two desensitization procedures did not differ significantly from one another on any of the measures. The finding that subjects in both desensitization conditions reported significant reductions in nontargeted anxieties was interpreted as support for Goldfried's theoretical model of systematic desensitization as training in a general anxiety-coping skill. Implications for further research were discussed.

Examiners: [redacted]

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Chapter I

Introduction

Statement of the Problem

Test anxiety is an anxiety response associated with test relevant situations or stimuli. Through past experiences, anxiety responses may become conditioned to test-taking stimuli. When too much anxiety is experienced in a testing situation, interference with a student's test performance may result. Interfering or debilitating levels of test anxiety can lead to task-irrelevant behaviors (such as rereading a question a number of times, engaging in excessive clock-watching, and thinking self-defeating thoughts) which, in turn, can interfere with task relevant test-taking behaviors (e.g., thinking clearly, writing, organizing answers, etc.) (Deffenbacher, 1971). The result of such behavior is poor test performance and an under-estimation of a student's knowledge and skills. Given the ever-increasing importance of education in our society, test anxiety, as a behavioral response that interferes with educational performance and success, has significant implications within educational settings.

One counselling approach commonly used to reduce interfering levels of test anxiety is systematic desensitization. Although the effectiveness of this procedure in the reduction of test anxiety is supported by empirical studies, the theoretical explanation for its efficacy is

unresolved (Goldfried & Davison, 1976). Systematic desensitization has been conceptualized as the substitution of relaxation for anxiety based on the learning principle of counterconditioning (Wolpe, 1969), and also as an active process whereby the client learns to apply relaxation as a general anxiety-coping skill (Goldfried, 1971). Both Wolpe's and Goldfried's models have definite theoretical and procedural differences, yet direct comparison studies of these two models have been limited. In the present study, Wolpe's and Goldfried's models are referred to as counterconditioning desensitization and self-control desensitization respectively.

The theoretical and procedural differences of the two models has led to differential predictions concerning treatment effect. An important distinction between the two models is that self-control desensitization predicts greater generalization of treatment effect, but those studies which have attempted to investigate this distinction have been marred by methodological weaknesses; thus, the need exists for a well-designed study to test directly and effectively the differential predictions of the two models concerning treatment generalization. In addition, limited research has been conducted concerning the effectiveness of Goldfried's procedures in the reduction of test anxiety within a group counselling format. The need exists, therefore, for more empirical studies directed at assessing the effectiveness of self-control desensitization.

Purpose of the Study

The purpose of this study is to compare and test directly the two theoretical models of systematic desensitization, and to provide empirical data concerning the efficacy of self-control desensitization within a group counselling format. This study will compare the effectiveness of the two desensitization procedures with a no-treatment control condition in (a) the reduction of test anxiety in university undergraduates as measured by self-report inventories and test performance measures, and (b) the generalization of treatment effect to general and nontargeted anxieties as measured by self-report questionnaires.

Significance of the Study

The present study has theoretical significance in that it represents a direct attempt to compare and assess two common theoretical models of systematic desensitization. It is an attempt to gather empirical support for the differential predictions of the two models--predictions based on each model's theoretical conceptualizations concerning the process of desensitization and generalization of treatment effect. By comparing the models on generalization of treatment, this study should provide information on the differential validity of the two desensitization models.

In addition, the present study should provide empirical support for the effectiveness of both desensitization procedures in the reduction of test anxiety in university students. Although considerable research exists in support of Wolpe's procedure as an effective group approach to test anxiety reduction, Goldfried's procedure, because of its recent development, has limited supportive research. Consequently, the results of this study have practical significance for self-control desensitization as a viable group counselling approach.

Chapter II

Review of the Related Literature

The Influence of Test Anxiety

Test performance is influenced by academic or scholastic aptitude, proper preparation in the form of sufficient and adequate study, and the anxiety component present in the testing situation. Too much anxiety in the testing situation can interfere with test performance.

Test anxiety is considered to be acquired through the learning process of classical conditioning whereby an individual learns to respond with anxiety when exposed to certain stimuli or situations. As a result of previous learning experiences, the individual has learned to associate anxiety to test relevant stimuli. It is postulated (Deffenbacher, 1971) that stimuli associated with testing lead the individual to respond with anxiety, which, if of sufficient intensity, lead to task-irrelevant behavior that interferes with test performance.

Support for the influence of test anxiety is available from such sources as observations of students and teachers, correlational analysis of test performance and anxiety level, and the manipulation of testing conditions. The influence of test anxiety is evident in the observations of students who show comprehension of course material through nontest indices such as essays and class participation yet do poorly on examinations. Similarly, the self-reports of

students indicate that anxiety interferes with recall and exam performance. In addition, teachers report that high anxious students perform poorly on tests and that high levels of anxiety impede learning and performance (Holt, 1964).

Empirical support for the influence of test anxiety is available from studies showing a negative or inverse relationship between test anxiety and test performance in evaluative situations (e.g., the higher the level of test anxiety the lower the level of performance under evaluative testing conditions). Sarason and Mandler (1952), using the Test Anxiety Questionnaire (TAQ), which is a self-report questionnaire designed to assess test anxiety, found that high test anxious college students had significantly lower scores on the Scholastic Aptitude Test (SAT) and the Mathematics Aptitude Test (MAT) than low test anxious students. For high school juniors and seniors, Sarason (1963) found a significant negative correlation between TAS scores and scores obtained on the School and College Ability Test (SCAT). Alpert and Haber (1960) found that high anxious college students performed poorer on a variety of academic performance measures (e.g., SAT, grade point average, exam scores in an introductory psychology course) than low anxious college students.

Paul and Eriksen (1964) correlated the scores obtained on an introductory psychology test by female college

students with their scores obtained on the TAQ. By grouping subjects according to ability, on the basis of the previously obtained SCAT scores, Paul and Eriksen found that high anxious subjects in the middle ability group did poorer in an "anxious" testing situation (e.g., a regular classroom exam) than in a "nonanxious" testing situation (e.g., a condition where the experimenters actively attempted to minimize anxiety and promote a relaxed atmosphere). These students also did poorer than high and low anxious subjects in the high and low ability group. Test anxiety was found to have its greatest effect on the test performance of students in the middle range of academic ability.

Additional empirical support for the effects of test anxiety is available from studies that have focused on the manipulation of testing conditions. Such studies have found that under neutral, nonevaluative conditions the performance of high anxious subjects generally does not differ significantly from the performance of low anxious subjects (Dunn, 1968; Sarason, 1972a, 1972b, 1973; Sarason & Palola, 1960). In the same or similar studies researchers found that the manipulation of test instructions can influence performance differentially according to level of test anxiety. Achievement-oriented instructions that lead to evaluative testing conditions affect the performance of high anxious individuals adversely, whereas the performance of low anxious individuals is either unaffected

(Longenecker, 1962; Sarason, 1972a; Sarason, Kestenbaum & Smith, 1972) or significantly improved (Longenecker, 1962; Sarason, 1972a; Sarason & Palola, 1960).

Finally, several studies (Lighthall, Ruebush, Sarason & Zweilbelson, 1959; Paul & Eriksen, 1964; Sarason, Davidson, Lighthall & Waite, 1958; Sieber, Kameya & Paulson, 1970) have found that when subjects have been equated on ability level, low test anxious subjects perform better than high anxious subjects under evaluative, anxiety-producing conditions. The above studies, whether correlational or experimental in design, indicate that test performance can be adversely affected by high levels of test anxiety.

Reduction of Test Anxiety - Systematic Desensitization

Studies on the effects of test anxiety indicate the importance of counselling for the reduction of interfering levels of anxiety. Successful reduction of test anxiety has the potential of reducing or eliminating interfering emotional responses and task-irrelevant behaviors, and thus make it possible for students to demonstrate to a fuller extent their skills and knowledge in evaluative conditions. One approach that has been widely and successfully employed is systematic desensitization.

Developed primarily by Wolpe (1958), systematic desensitization is an anxiety reduction procedure concerned with changing stimulus-response associations or habits.

The basic principle underlying this procedure is the introduction and establishment of responses that are incompatible with anxiety, such as relaxation. By experiencing relaxation in previous anxiety-evoking situations, a new, more appropriate response is associated or conditioned to the stimuli. Thus systematic desensitization is "a procedure entailing graduated exposure to imagined aversive stimuli, typically under conditions of muscle relaxation" (Goldfried & Davison, 1976, p. 134). The individual is exposed to anxiety-evoking situations gradually through a hierarchy consisting of scenes arranged in order of least to most anxiety-producing. In this way, the learning process can be controlled and the successful association of relaxation responses to the different scenes maximized. As relaxation rather than anxiety becomes associated to test-taking situations, the individual experiences a reduction of anxiety and a resulting increase in comfort when in situations that formerly produced anxiety.

Because it is not always possible to introduce or control actual anxiety-evoking situations, systematic desensitization typically uses imaginal situations. Relearning is assumed to occur during the visualization of the scenes. A basic assumption of systematic desensitization is "that an imaginary aversive scene is a functional equivalent of the real situation; enabling a

person to confront a fantasized representation of what he is afraid of is assumed to be analogous to his learning to face the situation in real life" (Goldfried & Davison, 1976, p. 113). By imagining anxiety-provoking situations while at the same time experiencing a response antagonistic to anxiety, such as relaxation, the client is able to weaken and replace the anxiety response so that anxiety is reduced or eliminated.

Distinctions of the Counterconditioning and Self-Control Models

Counterconditioning model of desensitization. This model assumes that individuals have learned through a process of classical or Pavlovian conditioning, to experience anxiety when exposed to previously neutral stimuli. Wolpe (1958, 1969) asserts that anxiety-reduction results from implementation of the learning principle of counter-conditioning. Counterconditioning means "the substitution of an emotional response that is appropriate to a given situation for one that is maladaptive" (Rimm & Masters, 1974, p.76). Using a classical conditioning paradigm, desensitization is seen as a process of unlearning a previously learned, maladaptive stimulus-response sequence. Anxiety that has been associated with testing situations is reduced by establishing a controlled learning process whereby relaxation rather than anxiety is associated with testing stimuli. Following a classical conditioning

paradigm relaxation is paired with test relevant anxiety-evoking stimuli in such a way that muscular relaxation as a response is maximized and anxiety responses are minimized. This condition is achieved by having the client gradually work through a graded hierarchy, proceeding from the least to the most anxiety-provoking scenes. Relaxation is repeatedly associated with the scenes, whereas anxiety responses are minimized and discouraged through termination of scene visualization if the client experiences any anxiety. Relaxation is reinstated before exposure to the scene is resumed. By using the pairing of a relaxation rather than an anxiety response to testing stimuli, the potential of the anxiety response occurring in the presence of such stimuli is weakened and eventually, ideally, replaced with a response of relaxation. In this manner, it is assumed that the individual learns or is conditioned to respond with relaxation, or at least less anxiety to testing stimuli rather than with high levels of interfering test anxiety.

Counterconditioning or the association of relaxation to previous anxiety-producing stimuli is based on the principle of reciprocal inhibition advanced by Wolpe. Reciprocal inhibition states that "if a response antagonistic to anxiety can be made to occur in the presence of anxiety evoking stimuli so that it is accompanied by a complete or partial suppression of anxiety responses, the

bond between those stimuli and the anxiety responses will be weakened" (Wolpe, 1958, p.71). As relaxation becomes associated with test anxiety stimuli, a suppression of the anxiety response is assumed to occur, resulting in the reduction of test anxiety.

Through the process of repeated pairing of relaxation to each previous anxiety-evoking situation, a process of stimulus generalization is presumed to occur among the scenes in the graded hierarchy (Wolpe, 1969). As the first scene is successfully desensitized, the strength of the anxiety response to the next scene is weakened due to the generalization of the relaxation response from the first to the second scene. This generalization effect, by weakening the anxiety-evoking potential of the second scene, facilitates the desensitization of that scene. Through successive steps of generalization, progress is believed to be facilitated through the graded hierarchy.

According to Wolpe's conceptualization, anxiety is a response to specific stimuli. Different kinds of anxiety are associated to specific stimuli categories. For example, test anxiety consists of anxiety responses associated with test-taking situations or stimuli. Consequently, to reduce a specific anxiety it becomes necessary to identify the particular situations that evoke the anxiety and arrange these stimuli in a hier-

archy before desensitization using counterconditioning can be used and anxiety reduction achieved. For each particular kind of anxiety (e.g., test, speech, snakes, heights, etc.) a separate hierarchy of the relevant situations must be constructed and worked through. Since the counterconditioning model attempts to replace the anxiety response with relaxation during the presence of the specific anxiety-provoking stimuli, treatment generalization is restricted to the previous mentioned process of stimulus generalization. Anxiety reduction is stimulus bound, meaning that generalization of anxiety reduction to other kinds of anxiety will be limited to the degree that these other nontargeted anxieties are similar to the specific anxiety that was successfully desensitized. For example, treatment generalization from test anxiety reduction to an anxiety related to snakes would not occur, according to this model, because the stimuli associated with these two anxieties are too dissimilar to allow for stimulus generalization.

Another important feature of the counterconditioning model of desensitization is the assertion that "it is absolutely essential that a client being desensitized maximize the amount of time that he is imagining a situation without becoming anxious, and that he minimize the amount of time he is confronted with an imagined situation that elicits anxiety" (Goldfried & Davison, 1976, p. 124).

Wolpe (1969) asserts that if a client continues to visualize a scene when anxiety is experienced, desensitization will be ineffective and resensitization to the situation will occur. In other words, to continue visualization when anxiety is experienced will lead to increased anxiety becoming associated with the imaginal situation and/or the undoing of any successful desensitization of that scene. As a result of this formulation, the Wolpian or counterconditioning model of desensitization emphasizes the presentation of hierarchial items in such a way that little or no anxiety is experienced during scene visualization.

The procedure of systematic desensitization following the counterconditioning model of Wolpe consists of three basic components (Wolpe, 1969, p.100):

> (1) training in deep muscle relaxation; (2) construction of an anxiety hierarchy (a graded list of scenes related to the client's specific anxiety, arranged in an ascending order of anxiety, starting with the least anxiety-evoking scene and terminating with the most threatening scene); (3) actual desensitization, where muscle relaxation is paired with the different anxiety-evoking scenes from the hierarchy.

Relaxation training is based on progressive relaxation procedures. With practice and experience obtained in

counselling and daily practice sessions, a potentially strong behavior is established - one that can be utilized in desensitization to suppress anxiety responses. Hierarchy construction is based on analysis of the client's anxiety-evoking stimuli. The stimulus determinants that evoke the anxiety responses are identified and used to construct the situations or scenes that comprise the hierarchy. Stimulus presentation is typically accomplished through client visualization of hierarchial items. In the actual desensitization phase, the client is deeply relaxed and then instructed to visualize the first anxiety-producing scene, ascending the hierarchy as each scene is successfully desensitized. If any anxiety is experienced, visualization of the scene is terminated and relaxation is re-introduced. Once relaxation has been restored, presentation of the scene is repeated.

Counterconditioning desensitization is a relatively passive approach, whereby the counsellor establishes a controlled situation for conditioning relaxation to previous anxiety-evoking situations. Minimal action and responsibility on the part of the client is required for this approach to be effective - the emphasis is on the passive substitution of relaxation for anxiety following the principle of counterconditioning, rather than on the active participation and involvement of the client as in a self-control approach to anxiety reduction.

A number of empirical studies based on Wolpe's counterconditioning model indicate that systematic desensitization significantly reduces scores on indices of test anxiety for college and university students. Anton (1976) reviewed 18 studies that used systematic desensitization to reduce test anxiety, and found significant reductions of self-reported test anxiety for 16 of the 18 studies. Of the 11 studies that used the Test Anxiety Questionnaire (TAQ; Mandler & Sarason, 1952) or the Test Anxiety Scale (TAS; Sarason, 1958) as measures of treatment effectiveness, 10 reported significant reductions in test anxiety.

Self-control model of desensitization. Goldfried (1971) has questioned whether the learning which occurs during desensitization sessions "represents a relatively passive process of deconditioning" (p.228), and consequently has construed systematic desensitization as "more of an active process, directed toward learning of a general anxiety-reducing skill, rather than the passive desensitization to specific aversive stimuli" (p.228). The emphasis in Goldfried's self-control model is on the use of relaxation as a self-control coping procedure for anxiety reduction, rather than the passive substitution of relaxation for anxiety as in Wolpe's counterconditioning model.

Goldfried shares Wolpe's view that anxiety is a learned behavior but does not refer directly to classical or Pavlovian conditioning in the acquisition of anxiety. According to Goldfried, an individual acquires, through past learning experiences, an avoidance response involving emotional components of fear or anxiety to certain situations or stimuli. This avoidance response is "conceptualized as being the end product of a series of mediational responses and stimuli" (Goldfried, 1971, p.228). Goldfried fails to elaborate on this mediational process but one possible interpretation could be that certain stimuli (such as test taking stimuli) lead to a response of muscular tension which, in turn, serves as a stimulus for avoidance behavior (which could take the form of interfering levels of anxiety and, as in the case of test anxiety, task-irrelevant behaviors). If this chain of stimuli and responses can be broken, then the terminating avoidance response with its emotional component of anxiety can be eliminated. Therefore, according to Goldfried (1971), systematic desensitization "involves not so much a passive 'reciprocal inhibition' as it does the active building in of the muscular relaxation response and cognitive relabeling into the r-s [response-stimulus] mediational sequence" (p.228).

In the self-control model of desensitization the client is taught to change or interrupt the maladaptive mediational sequence that leads to interfering or

debilitating anxiety. By actively introducing relaxation as a response to muscular tension, the client can prevent occurrence of the typical avoidance response with its associated anxiety component. Practice and experience in utilizing relaxation as a coping skill can short-circuit the previous maladaptive mediational r-s sequence, changing it to one that involves relaxation rather than anxiety. As Goldfried (1971) states, "relaxation responses may become anticipatory, thereby completely or partially 'short-circuiting' the anxiety reaction" (p.229).

For Goldfried, the underlying process in desensitization whereby anxiety responses are reduced or eliminated is not explained by the principle of counterconditioning as in Wolpe's theoretical explanation. Instead, Goldfried conceptualizes the process of desensitization by means of a self-control model. According to this model, systematic desensitization involves the training of individuals to use relaxation as a general anxiety coping skill. Desensitization is seen as a treatment approach that teaches anxious individuals to relax when tense. Goldfried (1971) asserts that what really happens during Wolpe's procedure of systematic desensitization is that the client is taught, through progressive relaxation, to identify the proprioceptive cues of tension and to discriminate between those cues and the cues associated with relaxation. The client is taught to respond to cues of tension with muscular relaxation which, consequently, leads to the experiencing

of calm in what were previously aversive situations. For example, in desensitization proper the client is instructed to relax and then visualize an anxiety-evoking scene; if any anxiety is experienced (e.g., the client perceives cues of tension) this signals the client to signal the counsellor, who, in turn, instructs the client to cease visualization and commence relaxation. When the client is once again relaxed, instructions are given to return to visualization of the same scene. This procedure is conceptualized by Goldfried (1971) as an active process where "what the client learns is a means of actively coping with the anxiety, rather than an immediate replacement for it" (p.229). The client learns to counter experienced anxiety with relaxation. Thus what really happens during desensitization is not the replacement of relaxation for anxiety following the principle of counterconditioning, but rather a process (although indirect) of teaching clients to actively use relaxation to cope with anxiety.

In contrast to the counterconditioning model, self-control desensitization does not rely on the process of stimulus generalization for reduction of nontargeted anxieties. Because this approach emphasizes responding to cues of tension with relaxation, it is not stimulus bound as in the Wolpian approach. Consequently, self-control desensitization can be used whenever anxiety is experienced, regardless of the anxiety-producing stimuli.

Since treatment is designed to provide training and practice in the use of relaxation as a general coping skill, Goldfried's model predicts greater generalization of anxiety reduction to other, nontargeted anxieties than Wolpe's stimulus bound approach.

Another important distinction between the two models is that Goldfried does not assert that exposure to scenes when anxiety is experienced will lead to resensitization. Unlike the counterconditioning model, when anxiety is experienced, the client in self-control desensitization is encouraged to continue visualizing the scene and to simultaneously use newly acquired skills in relaxation to relax away the muscular tension. Rather than viewing anxiety during desensitization as something that must be avoided, Goldfried sees such an experience as an opportunity for clients to practice and perfect their relaxation coping skills. Both models, however, emphasize the use of a graded hierarchy in order to maximize the success of desensitization.

Goldfried (1971), in keeping with his conceptualization of desensitization as an active anxiety-reducing skill and in order to maximize the effects of his mediational model, has offered the following procedural changes from the traditional counterconditioning approach:

> (a) a different rationale for systematic desensitization given to the client (b) a different focus placed on the purpose of relaxation training, (c) different guidelines used in the construction of a

> hierarchy, (d) a modified manner in which the scenes are presented in imagination and (e) a greater emphasis on instruction in the use of relaxation response in vivo (p.231).

For the rationale of desensitization, the client, as in the counterconditioning model, is told that anxiety is a learned behavior. Through past experiences one has learned to respond to certain situations with anxiety. In self-control desensitization, however, the rationale goes one step further with the emphasis that counselling will teach the client the active coping skill of muscular relaxation which can be applied whenever anxiety or tension is experienced.

As in Wolpe's approach, relaxation training is important for teaching the client how to relax. For both models, muscular relaxation is an integral part of the entire desensitization procedure, since relaxation serves as an incompatible response to anxiety and muscular tension. As in the counterconditioning model, the client is encouraged to discriminate between the experiences of relaxation and tension. In self-control desensitization, however, special emphasis is placed on recognizing personal cues of tension so that such cues can serve as signals for utilizing relaxation. Consequently, Goldfried's approach teaches the client both <u>how</u> and <u>when</u> to relax.

Because the client is taught to respond to personal cues of anxiety, the situation or hierarchical scene

eliciting anxiety is less important than the anxiety response itself. Consequently, in this approach an hierarchy involves different scenes or situations from widely different areas of concern (e.g., test, snakes, heights, etc.) ordered within a single hierarchy in increasing amounts of anxiety. In self-control desensitization hierarchy construction involves a multi-theme approach rather than the single theme hierarchy characteristic of counterconditioning desensitization.

The presentation of imagined scenes differs from Wolpe's model in that the scenes are seen as opportunities for client rehearsal in anxiety reduction. When an imagined scene evokes anxiety, instead of terminating the scene, the client continues visualization and uses his experienced cues of tension as a signal for utilizing relaxation. The client focuses on relaxing away the anxiety. Thus, the client gains practice and experience in the application of his learned anxiety-management coping skills.

Finally, and unlike Wolpe's approach, Goldfried's procedure emphasizes the use of relaxation in actual anxiety-producing situations. This in vivo practice is designed to improve and strengthen the client's skill in self-control anxiety-management. The client identifies cues of tension and utilizes muscular relaxation, thus reducing or eliminating the experienced anxiety.

Goldfried (1971) has found some indirect support for his self-control model of desensitization. He cites a number of desensitization studies (Cooke, 1966; Lang, Lazovik, & Reynolds, 1965; Paul, 1966; Paul & Shannon, 1966) based on the counterconditioning model, which reported a general decrement in subjects' anxiety level where anxiety reduction generalized to a number of widely differing situations and objects. The generalization of anxiety reduction was greater than what could be explained by the process of stimulus generalization, and therefore, Wolpe's model of desensitization. Such results were more easily accounted for in terms of Goldfried's rationale of desensitization, where subjects acquire in desensitization an active anxiety-reducing skill which they could apply whenever tension was experienced. Goldfried also emphasizes that although the Paul and Shannon (1966) study followed a strict Wolpian model of systematic desensitization, clients in this study reported perceiving and utilizing relaxation as an active coping skill for dealing with anxiety and tension experienced in widely differing life situations.

Indirect support for the effectiveness of Goldfried's model in the anxiety reduction of college students can be found in a number of studies which utilize relaxation as self-control (Chang-Liang & Denney, 1976; Deffenbacher & Snyder, 1976; Denney, 1974; Goldfried & Trier, 1974;

Sherman & Plummer, 1973). Such studies are similar to Goldfried's approach in that clients are taught how and when to relax. These studies differ from Goldfried's procedures, however, in that hierarchy construction and scene visualization is not used. Rather than focusing on imaginal desensitization, relaxation as self-control studies emphasize the application of relaxation through in vivo practice plus discussions focused on successes and failures in applying relaxation in various anxiety-producing situations.

Comparative Desensitization Studies

Both Wolpe and Goldfried have proposed theoretical models to account for the effects of desensitization. The Wolpian model conceives of systematic desensitization as a relatively passive, counterconditioning process which predicts significant reduction of targeted anxiety, with generalization to nontargeted anxieties being restricted to stimulus generalization. Consequently, the Wolpian model predicts substantial reduction on indices of targeted anxieties but small reduction on indices of general and nontargeted anxieties. The Goldfried model of desensitization utilizes a mediational concept and conceptualizes desensitization as training in relaxation as self-control through implementation of a general anxiety-reduction skill. Utilizing some minor procedural changes, Goldfried's model "predicts reduction in targeted anxieties but also

considerable reduction in general or nontargeted anxieties since the person supposedly has learned a general, rather than situational anxiety reduction strategy" (Deffenbacher, Note 1). Research directed at testing the differential predictions of these two models has been limited.

Zemore (1975) tested the differential prediction of the two models in a study involving college students who scored high on both public speaking and test anxiety as measured by the Fear Survey Schedule. Subjects were divided into one of five groups: Wolpian desensitization of test or speech anxiety, Goldfried's procedure of desensitization for test or speech anxiety, and a no-treatment control group. Anxiety level was assessed by both self-report and performance measures of anxiety, utilizing a pre and post-test design. The target anxiety of each treatment group was either speech or test anxiety, with the other anxiety becoming the nontargeted anxiety for which generalization of treatment was assessed. For example, if test anxiety was the targeted anxiety of the treatment group then generalization of anxiety reduction was assessed by indices of speech anxiety. Zemore found that compared to a no-treatment control group, both forms of desensitization resulted in significant reduction in both targeted and nontargeted anxieties. There was no significant difference between the two desensitization approaches in effectiveness of targeted anxiety reduction and treatment generalization to nontargeted anxiety. These results, although supportive

of the self-control model's prediction of treatment generalization, fail to compare and test adequately the differential prediction of the two desensitization approaches. The results showed that the Wolpian model also led to treatment generalization of the nontargeted anxiety. These results, however, can be criticized in that the two anxieties used in this study were both evaluative anxieties. Consequently, the ability of Wolpe's model to generalize from target to nontarget anxiety may be due to the similarities of these two anxieties. In order to test effectively the differential predictions of the two models, markedly dissimilar anxieties need to be used.

Spiegler, Cooley, Marshall, Prince, Puckett, and Shenazy (1976) conducted an experimental comparison of Wolpe's and Goldfried's approaches to systematic desensitization with college students reporting high test anxiety as measured by the TAS. Subjects were placed into three groups: counterconditioning desensitization, self-control desensitization, or a wait-list control group. The authors, in line with Goldfried's model predicted that the self-control desensitization group would achieve significantly greater generalization of anxiety reduction to nontargeted anxieties than the counterconditioning group. Targeted anxiety (i.e. test anxiety) was measured by the TAS and nontargeted and general anxieties were measured by the FSS and a situational stress measure unrelated to the targeted anxiety (i.e. a film on emergency medical procedures

for drug overdose). Although the authors concluded that "on all three measures the self-control procedures were superior to the counterconditioning procedures" (Spiegler et al, 1976, p.83), inspection of the results showed that a significant statistical difference in favor of the self-control existed only for the TAS. There was no significant difference between the two desensitization groups on measures of nontargeted or general anxiety. Finally, further criticism of this study is concerned with the inability of the researchersto acquire a significant difference between counterconditioning desensitization and the no-treatment control group on any of the three indices of anxiety. This failure to establish the effectiveness of Wolpian desensitization is contradictory to much research, and raises serious doubts about the adequacy of the study.

Research aimed directly at testing the differential predictions of the two models has been marred by research weaknesses. In addition, research concerned with the effectiveness of Goldfried's procedure in group conditions has been limited to the two comparative desensitization studies (Spiegler et al, 1976; Zemore, 1975). Studies with applied relaxation or relaxation as self-control provide only indirect support for the efficacy of the self-control model.

Experimental Focus and Hypotheses

The purpose of the present study was to compare and test the two models more clearly and precisely, and to

assess the effectiveness of self-control desensitization in test anxiety reduction of university students. This study compared the two models of desensitization in the reduction of test anxiety and generalization of anxiety reduction to general and nontargeted anxieties. The present study was a modification and extension of the previous mentioned comparative desensitization studies (Zemore, 1975; Spiegler et al, 1976).

The independent variables were the two different treatments given to the desensitization groups - systematic desensitization following Wolpe's theoretical model and procedures, and desensitization utilizing Goldfried's conceptualization and procedures. A delayed-treatment control group constituted the baseline against which the two treatment conditions were compared. The dependent variables were the scores obtained on indices of test, general, and nontargeted anxieties. Indices of test anxiety were obtained from scores on the Test Anxiety Scale (TAS; Sarason, 1972a), the Osterhouse Test Anxiety Scale (Osterhouse, 1976), and two performance measures - the Wonderlic Personnel Test (WPT; Wonderlic, 1970) and the Brown Digit Symbol Test (Brown, Note 2). General anxiety was measured by scores obtained on the IPAT Anxiety Scale (IPAT; Cattell & Scheier, 1963), with nontargeted anxieties being assessed by scores on the Fear Survey Schedule (FSS; Wolpe, 1969).

The experimental hypotheses of the present study were as follows:

(1) in order to assess the effectiveness of the two desensitization models in the reduction of test anxiety in university students both approaches were compared to a delayed-treatment control condition. Stated as a null hypothesis, it was predicted that there would be no differences among the three conditions in the reduction of targeted or test anxiety following treatment.

(2) To compare and assess the differential predictions of the two models in the generalization of anxiety reduction to general and nontargeted anxieties, both treatments were compared to the delayed-treatment control condition. Stated in the null hypothesis, it was predicted that no difference would exist among the three group conditions in treatment generalization following treatment.

Chapter III

Method

Subjects

University of Victoria students in three sections of a first year psychology course and two sections of a second year sociology course were given the 37-item version of the Test Anxiety Scale (Sarason, 1972a). From a pool of 525 students, subjects were selected if they met the following criteria: (a) scored in the upper third of the TAS distribution (scored 26 or higher), (b) indicated interest in test anxiety reduction by completing a face sheet, attached to the TAS, which asked for the name, phone number, class standing, and course number of those students interested in small group treatment of test anxiety (see Appendix A for a copy of the face sheet), and (c) volunteered when contacted by phone. Only students scoring in the upper third of the TAS distribution were considered as possible subjects, with this range operationally defined as high test anxiety. The inclusion of individuals as subjects if they scored in the upper third of the score distribution was consistent with other test anxiety reduction studies (Chang-Liang & Denney, 1976; Cohen, 1969;). It was felt that treatment would only be effective and relevant to high test anxious individuals. Significant reduction of test anxiety would be difficult for those individuals scoring below 26 on the TAS since their scores would be low to begin with, making further reductions statistically difficult.

Those students meeting the first two criteria were contacted by phone. Each student was told that the small group treatment was proven to be effective in reducing test anxiety, and consisted of learning how to relax and then pairing the state of relaxation to imagined test anxiety-producing situations. Students were informed that the personal commitment required was participation in all counselling sessions and the pretest and posttest assessments. Of the 48 students contacted, 39 (33 females, 6 males) agreed to participate, with scores ranging from 26 to 37. Those students refusing to participate did so for a variety of reasons, such as a change in interest, dislike for completing more questionnaires, and lack of sufficient time to allow for full involvement in the treatment sessions.

The 39 subjects were randomly assigned to one of two conditions: (a) treatment (n = 26), and (b) no-treatment control (n = 13). Within the limitations of scheduling considerations, treatment subjects were assigned to one of six groups. These six groups were divided between the two treatment conditions (counterconditioning and self-control desensitization), with three groups randomly assigned to each. Each treatment condition consisted of two groups of four and one group of five subjects.

Following the first treatment session, three subjects from the counterconditioning desensitization groups and four subjects from the self-control desensitization groups

dropped out of the study. Three of these subjects failed to appear for the first session. Follow-up indicated that these subjects had changed their perceptions regarding need for treatment. The other four subjects (two from each treatment condition) dropped out of the study following the first session. These students indicated that they were expecting treatment to focus on the development of study and exam-writing skills. These students were referred to the university's Reading and Study Skills Course. Since the loss of subjects was equally distributed among the six treatment groups, no adjustment of subject assignment was considered necessary.

After the fourth treatment session, one subject was removed from the counterconditioning desensitization groups because he was unable to visualize any of the first three scenes from the hierarchy without experiencing anxiety. It was discovered that this student was undergoing neurological assessment and had a definite learning disability due to the residual effects of infantile hemiplegia. Because of an impaired reading ability, this student had to spend considerably more time studying than other students; consequently, it was understandable that he would experience high levels of anxiety when exposed to situations depicting upcoming exams and the studying for such exams (as presented in the first three scenes). In addition, he experienced considerable anxiety over the final results and possible implications of the neuro-

psychological assessment that he was undergoing. Because of the special circumstances surrounding this subject, his data were not included in the study. The student was seen individually by the author for personal counselling.

Three of the 13 subjects in the no-treatment control condition did not complete the posttest; one subject had dropped out of university, another refused to participate in the posttest because of a change in interest in test anxiety, and the third subject could not be contacted. The final number of subjects in the study was 28 (25 females and 3 males), with three groups of three subjects each for both counterconditioning and self-control desensitization. There were 10 subjects in the no-treatment control condition.

Measures

The three measures used in both pretest and posttest and the three measures used only in the posttest are described in the order of their presentation (see Appendix B for a copy of each of the measures, with the exception of the IPAT Anxiety Scale and the Wonderlic Personnel Test, which are available from the respective publishers).

Test Anxiety Scale. The TAS is a 37-item, true-false self-report inventory measuring test anxiety. The TAS is a modification of the Test Anxiety Questionnaire (TAQ; Mandler & Sarason, 1952). Because these two inventories

have a correlation of .93, the two are considered functionally equivalent measures. These two questionnaires are among the most commonly used self-report measures of test anxiety. Suinn (1969) found the test-retest reliability of the TAS to be .78 for a five week period.

IPAT Anxiety Scale. The IPAT is a 40-item self-report instrument measuring general anxiety, and provides a measure whereby generalization of treatment effect to general anxiety may be assessed. The construct validity is estimated at .85 to .90, with test-retest reliability ranging from .87 to .93 for a two-week interval and .82 for a four-week interval (Cattell & Scheier, 1963). The IPAT has been used in a number of similar studies (Chang-Liang & Denney, 1976; Deffenbacher & Snyder, 1976; Sherman & Plummer, 1973) to assess treatment effects on general anxiety.

The term general anxiety as used in this study, is operationally defined as each subject's IPAT score. The IPAT tends to rank-order subjects in the same order as expert psychiatric diagnosis with regards to anxiety (Cattell & Scheier, 1961) and has been shown to differentiate between clinically diagnosed high anxiety cases (e.g., anxiety hysterics and anxiety neurotics) and normal subjects (Cattell & Scheier, 1963). The IPAT was "primarily designed to measure free-floating, manifest anxiety level, whether it be situationally-determined or relatively independent of the immediate situation" (Cattell & Schier, 1963, p.13).

Fear Survey Schedule. The FSS is an 87-item questionnaire measuring self-reported anxiety in a wide variety of situations (e.g., airplanes, social rejection, spiders, public speaking, etc.). The FSS serves as an index of anxieties whereby generalization of anxiety reduction to nontargeted anxieties may be assessed. The test-retest reliability of the FSS has been found to be .72 for a five-week period (Suinn, 1969). The FSS has been used in a number of similar studies (Chang-Liang & Denney, 1976; Deffenbacher & Snyder, 1976; Lang & Lazovik, 1963; Sherman & Plummer, 1973) to assess treatment generalization to nontargeted anxieties.

Brown Digit Symbol Test. The Brown is a timed (2 minutes) digit symbol test which, when accompanied by stress instructions, provides a performance measure to assess treatment effectiveness in reducing test anxiety. Other studies using digit symbol tests have shown anxiety related effects. Boor and Schill (1967) found that high anxious subjects performed significantly poorer than nondefensive low anxious subjects on the Wechsler Digit Symbol Test, a test very similar to Brown. Meichenbaum (1972) in a study concerned with the reduction of test anxiety in college students, found that two treatment groups (cognitive modification and systematic desensitization) had significantly higher scores on the Brown than a no-treatment control group.

Wonderlic Personnel Test. The WPT is a timed (12 minutes) intelligence aptitude test used to discriminate among individuals in personnel selection (Wonderlic, 1970). It is a short intellectual test, which like the Brown, provides an opportunity to assess whether treatment led to a significant increase in test performance. In a study comparing self-control relaxation, systematic desensitization, relaxation only, and a no-treatment control in the reduction of test anxiety, Chang-Liang and Denney (1976) found that the applied relaxation group had significantly higher scores on the WPT than the other three groups.

Osterhouse Test Anxiety Scale. The Osterhouse is a 16-item Likert-type, self-report questionnaire measuring test anxiety specific to a preceeding test. By providing a measure of test anxiety as related to a specific test-taking situation, the Osterhouse provides a means of assessing treatment effectiveness. The Osterhouse provides a total test anxiety score as well as separate emotionality and worry scores related to examination performance. A split-half reliability coefficient of..92 was found (Liebert & Morris, 1967), and test-retest reliability was found to be .68 and .72 for emotionality and worry components, respectively, for a 7-week period (Osipow & Kreinbring, 1971). This study is concerned only with the total test anxiety score of the Osterhouse.

The two performance measures, the Brown and the WPT, were administered after subjects had read a set of anxiety-elevating instructions informing them that they were about to take an IQ test. These instructions were introduced in order to create an evaluative, test-like situation similar to testing conditions subjects were likely to encounter in vivo. The instructions stated that the test provided a very sensitive measure of general intelligence and problem-solving ability, and that each individual's score would be compared with the scores of the other students (see Appendix C for a copy of the anxiety-elevating instructions). The test was called the Brown-Wonderlic Intelligence Test and was described as consisting of two parts - the Brown and the WPT. The two performance measures were presented as parts of the same test in order to simplify application of the stress instructions and to create similar testing conditions for both measures. In addition, presenting both measures as parts of the same test allowed subjects to apply the Osterhouse Test Anxiety Scale to both measures, since the Osterhouse requires subjects to rate their personal reactions to the test they have just completed.

Following completion of the posttest, subjects were informed that the Brown and Wonderlic were performance measures used to assess whether test anxiety reduction

led to test performance increase. Subjects were ensured that the two tests were not measures of general intelligence and problem-solving ability.

Assessment Procedure

Pretesting. One week prior to treatment all subjects participated in pretest assessment, where one measure of general anxiety, the IPAT Anxiety Scale, and one measure of nontargeted anxieties, the FSS, were administered. Because of timetable conflicts, it was necessary to schedule the pretest sessions within a two day period. The TAS scores, collected two weeks previously during the initial selection of subjects, were used as a pretest measure of test anxiety.

Posttesting. One week after the last treatment session the TAS, IPAT, and FSS were readministered to all subjects. These questionnaires were followed by the administration of the two performance measures, the Brown Digit Symbol Test and the Wonderlic Personnel Test. The Osterhouse Test Anxiety Scale was completed immediately following the two performance measures. Timetable conflicts made it necessary to schedule two posttest sessions within a two day period. To remove any possible influence of the group counsellor's personal characteristics on subjects' post-treatment performance, posttest assessment was conducted by a counselling psychology graduate student who was unfamiliar to the subjects.

Treatment

The author, a male graduate student in counselling psychology, served as the group counsellor for both treatment conditions. Treatment consisted of eight 50-minute sessions over a four week period and was administered in small groups of three students. Subjects who missed a group session were given an individual make-up session by the group counsellor, thereby ensuring that all subjects completed the eight treatment sessions. Individual make-up sessions were required for three self-control and four counterconditioning treatment subjects, with no subject requiring more than one individual session. Treatment took place in a small classroom using the tables and chairs available there. The group treatment conditions were held constant except where the two theoretical models dictated procedural differences.

Counterconditioning desensitization followed the general method presented by Wolpe (1969) and was based on group desensitization procedures as advanced by Osterhouse (1976), Paul and Shannon (1966) and Deffenbacher (Note 3). The major features of this treatment included: (a) training subjects in progressive relaxation; (b) constructing a spatial-temporal hierarchy of anxiety-evoking scenes related to test anxiety; (c) counter-conditioning scenes

from the hierarchy by instructing students to visualize each scene while in a state of deep muscle relaxation. The scenes were presented in the order of least to most anxiety-evoking following specific guidelines of item presentation and timing.

During the first session approximately 5 minutes were spent on personal introductions and the sharing of reactions to testing situations by each student. Five to ten minutes were spent on the presentation of the rationale and procedures of treatment. The rationale followed closely that described by Deffenbacher (Note 3) and followed a statement that test anxiety was a learned response acquired through previous experiences and that this response could be unlearned. This unlearning could be achieved by identifying those situations related to test-taking that were anxiety-evoking, ordering those situations in a hierarchy from least to most anxiety-producing, and visualizing each scene repeatedly while deeply relaxed. It was explained that by utilizing this principle, known as counterconditioning, relaxation would become associated with previous anxiety-producing situations, and that the resulting reduction in test anxiety experienced in counselling had a strong tendency to generalize to real life situations. Further, it was explained that relaxation was used because it was incompatible with

anxiety, in that one could not be both tense and relaxed at the same time. It was also explained to subjects that test anxiety can be affected by two components: (a) ability (which involves scholastic aptitude and study skills proficiency), and (b) anxiety as a learned response pattern. It was emphasized that counselling would focus only on the latter. Subjects were informed that the presence of some anxiety in test-taking situations was valued as a motivating factor; consequently, the goal of counselling was not the complete elimination of test anxiety but rather the reduction of high levels of debilitating test anxiety which interfere with maximal test performance.

A brief description of each of the group sessions was given to the students. The importance of attending all sessions was stressed.

The next 30 minutes consisted of demonstration and training in progressive relaxation using a modified version of Paul's (1965) procedure as presented by Deffenbacher (Note 3). The technique of progressive relaxation was first explained and demonstrated by the counsellor. After answering questions, the counsellor guided students through the relaxation training. Briefly, this involved dimming the lights and instructing the students to close their eyes and to make themselves as comfortable as possible while sitting in their chairs,

feet flat on the floor. Students were instructed to follow the counsellor's instructions to tense and hold gross muscle groups, focusing attention only on the muscle group being tensed, until the counsellor says "Now, relax", and then to release immediately the muscle group and focus only on the feelings of relaxation. Each muscle group was tensed for 5 to 10 seconds and released or relaxed for 15 to 20 seconds. Students were instructed to note the difference between feelings of tension when the muscles were tensed and feelings of relaxation when the muscles were released. The first muscle group tensed and released was the right hand and forearm, followed by the left hand and forearm, both upper arms, the shoulders, various facial muscles, the neck, chest, back, stomach, hips and buttocks, thighs, and finishing with the lower legs. In the first two sessions, each muscle group was tensed and relaxed twice.

After completion of the relaxation training, students were aroused and the remaining 5-10 minutes were devoted to a discussion of reactions and feelings experienced during relaxation training. Students were instructed to practice relaxation at least once each day between sessions. To facilitate practice, each student was given a written description of the relaxation procedures and a relaxation record sheet. (See Appendix D for a copy of each).

The first 5-10 minutes of the second session were devoted to discussing reactions and problems involved in relaxation practice, reinforcing successful practice and encouraging continuation of relaxation training between sessions. The next 10-15 minutes focused on the construction of a test anxiety hierarchy. Through group discussion, students, across all three groups, generated a list of 16 anxiety-producing situations relative to test-taking. Each item had situational elements common to all students, yet was worded to allow each student to include details of his own situational experiences. Ordering of the items into a hierarchy was done during the third session.

The next 20-25 minutes of the second session involved additional practice in relaxation training similar to the first session. Following progressive relaxation, about 5 minutes were devoted to discussing reactions to relaxation training. Students were encouraged to tense and release each muscle group once rather than twice as they became more proficient at relaxation practice.

During the third session 5 minutes were devoted to discussion and reinforcement of relaxation practice. The next 10 minutes were spent on rank-ordering the hierarchy items from session 2. Each subject was provided with a typewritten list of the 16 situations and was instructed to rank-order the scenes from least to most anxiety-producing. After the group session, the counsellor

computed the average ranking of each item to determine the placement of each scene within the hierarchy. The resulting spatio-temporal hierarchy was a slight modification of the test anxiety hierarchy used successfully by Deffenbacher (1974) in the reduction of test anxiety in college students, (see Appendix E for a copy of the hierarchy), and was used by each of the three groups in the counterconditioning treatment condition.

Following completion of item ranking, about 5 minutes were used to explain visualization testing to students. Students were told that once they were deeply relaxed two neutral scenes would be presented. These scenes were described as providing an opportunity to test and develop ones ability to visualize scenes clearly and adequately. Twenty to 25 minutes were spent in progressive relaxation training and visualization testing. For relaxation training students were instructed to tense and release each muscle group once. At the completion of the relaxation training students were instructed to "place yourself in the following situation: do not see yourself as an outside onlooker, but actually experience what is going on in this situation". The first scene had students imagine details of the room that they were sitting in; the second focused on lying at the beach on a warm summer day. After arousing students from relaxation at the

end of the second scene, about 5-10 minutes were spent discussing each students ability to relax and visualize. In order to determine whether students would be able to experience anxiety when visualizing scenes from the hierarchy, students were instructed to close their eyes and visualize the following scene from the hierarchy: "You are sitting in the exam room waiting for the exam to be passed out." After termination of the scene, each student's ability to visualize was discussed and any problems were corrected.

Session 4 devoted the first 5 minutes again to a discussion of problems related to the practice of relaxation. About 5 minutes were used to describe the process of desensitization and the signal system to be used by students when visualizing a scene during desensitization. Students were told that desensitization involved the association of deep muscle relaxation to the visualization of scenes from the hierarchy, with the result that relaxation rather than anxiety would become associated with test-taking situations. Students were told that if they experienced any anxiety or tension while visualizing a scene they were to signal the counsellor by raising their index finger. The counsellor would then terminate the scene and assist the students to become deeply relaxed again.

Relaxation was induced, as previously, but with the addition of the "relaxation via letting go" procedures as described by Goldfried and Davison (1976). This relaxation method was introduced after completion of the last tensing-releasing segment of progressive relaxation training. The verbatim instructions used in this procedure are available in Goldfried and Davison (1976, p.95). For the letting go or releasing procedure, students were instructed to release or mentally relax their muscles as the counsellor verbally guided the students through the various muscle groups, starting with the hands and forearms, upper arms, shoulders, etc. and finishing with the lower legs. The addition of the releasing procedure in the relaxation training makes it eventually possible for students to ahcieve a deep state of relaxation without having to tense each muscle group first. It is also more sensitive to the needs of students who, as a result of becoming proficient at relaxation, find the tensing stage of relaxation induction to be distracting and unnecessary. Relaxation required 15-20 minutes to complete.

After all students were deeply relaxed, desensitization of the first 3 scenes from the hierarchy was implemented, following the guidelines for timing and scene presentation as described by Deffenbacher (Note 3). Each scene was presented for a maximum of 30 seconds, interspersed with 20 to 30 seconds of relaxation instruct-

ions if no anxiety was signaled. If a student signaled anxiety, the scene was terminated for all students, and relaxation was induced with verbal assistance from the counsellor for 30-60 seconds. Two successful presentations (no anxiety signaled) of 30 seconds were required before ascending to the next item on the hierarchy. A maximum of 6 presentations per scene were allowed - after the sixth presentation the group moved on to the next scene, unless it was near the end of the session in which case the last successful scene was presented twice. One minute of relaxation instructions occurred between different items. Each session was terminated with two successful presentations. Desensitization commenced with the last successful scene from the previous session. A minimum of three and a maximum of five scenes were presented each session. Presentation of the first three scenes in session 4 required 10-15 minutes to complete..

The remaining 5-10 minutes of session 4 were used to discuss reactions and problems relevant to relaxation and desensitization procedures. Students were instructed to use the releasing procedure of relaxation as part of their relaxation practice.

Sessions 5 through 8 were conducted according to the following time schedule: the first 5-10 minutes were used to discuss and reinforce relaxation training; the next 10-15 minutes were devoted to relaxation; and the

remaining time was used to desensitize scenes from the hierarchy, with the last 5 minutes of each session used for a discussion of reactions towards desensitization. For session 5 relaxation was induced by using the tensing and releasing method followed by the letting go or releasing procedure. Like the previous sessions, relaxation was induced with verbal assistance from the counsellor. For the last 3 sessions, relaxation was achieved through use of the releasing procedures, with tensing and releasing used only for problem muscle groups. This relaxation was primarily client-induced with verbal assistance given by the counsellor only for the last 2 minutes of relaxation training.

Self-control desensitization followed the general procedures as outlined by Goldfried (1971, 1973) and Goldfried and Davison (1976). This treatment condition followed the same session format and time scheduling as counterconditioning desensitization, with differences in treatment occuring only when dictated by theoretical and procedural considerations. Self-control desensitization differed from the counterconditioning procedures with the following: (a) a treatment rationale that emphasized the learning of an active coping skill (relaxation) to deal with anxiety; (b) relaxation training as a self-control technique with emphasis on tension as a cue to relax; (c) a multi-theme hierarchy; (d) continual visual-

ization of a scene during desensitization even after anxiety had been experienced, and using that tension as a cue to relax; (e) encouraging the use of in vivo relaxation to reduce tension that occurs in various life situations.

In session 1 the treatment rationale was presented based on that described by Goldfried (1971). The rationale emphasized that counselling would provide subjects with an active coping skill in the form of relaxation to deal with anxiety experienced in test-taking and other anxiety-producing situations. Subjects were told that this coping skill would be learned and perfected by repeatedly and vividly imagining various anxiety-evoking scenes, while at the same time using newly acquired relaxation skills to reduce any experienced tension. The purpose of the counselling sessions was described as providing "practice in learning to 'relax away' tensions as they start to build up, and ...to provide rehearsal for certain specific situations where (one) may actually try out his relaxation skills in vivo" (Goldfried, 1971, p.231). This skill can be used to cope with anxiety in a wide variety of situations, and subjects were told that they would be encouraged throughout counselling to use this coping skill whenever they experienced anxiety and muscular tension.

Following presentation of the treatment rationale, a brief description of the general counselling procedure to be used in each of the group sessions was given. The

importance of attending all sessions was emphasized.

Relaxation training was the same as the counter-conditioning treatment with the exception that self-control desensitization subjects were instructed to pay particular attention to the tension phase of relaxation training in order to increase their awareness of those bodily reactions and sensations associated with being tense. Subjects were instructed to use these sensations as cues or signals to reduce tension experienced during scene presentations and in vivo experiences. Subjects were also instructed to practice relaxation training daily. As in the countercondi-tioning groups, each subject was given a written description of the relaxation procedures and a relaxation record sheet (see Appendix D).

Session 2 followed the same format as the countercon-ditioning procedures except that hierarchy construction consisted of generating items from a wide variety of themes or situational categories, rather than being limited to a single theme. Through group discussion subjects, across all three groups, compiled a list of 20 anxiety-producing scenes, varying in degree of anxiety. The scenes were relevant to test-taking as well as other situations that are commonly anxiety-evoking to students (such as giving a speech, speaking in a large class, being the centre of attention, etc.).

As in the counterconditioning treatment, self-control subjects in session 3 rank-ordered anxiety-producing items, repeated the relaxation training of the previous two sessions, and participated in visualization testing. The same scene was used to assess each subject's ability to experience anxiety while visualizing an anxiety-evoking item. Because of the wide variety of situations proposed for the self-control hierarchy, there was considerable variation in the rank-ordering of some items. Items which received widely varying rankings (and thus would make a mean ranking misleading) were discarded. Of the five items discarded, none referred to test-taking situations. On the basis of computed average rankings the remaining items were arranged in an hierarchy from least to most anxiety-producing. Of the 15 items used, nine were relevant to test anxiety and were identical to items used in the counterconditioning hierarchy. Other themes incorporated into the hierarchy focused on giving an oral presentation (one item), receiving anger and criticism (one item), being in an unfamiliar situation (two items), and speaking out in a class or discussion group (two items) (see Appendix F for a copy of the hierarchy). The same multithematic hierarchy was used for each of the three treatment groups.

The situations represented in this hierarchy could, in many cases, be expected to produce some degree of

anxiety. What was emphasized to the subjects was not the complete elimination of all anxiety, but rather learning to reduce debilitating levels of anxiety which interfere with ones performance, whether that be performance on a test, speech, or in socializing.

Session 4 began with about 5 minutes devoted to a discussion of problems and reactions related to relaxation practice, followed by a 5-10 minute description of the desensitization process, scene presentation and signal procedures to be introduced during this session. Subjects were told that the desensitization process involved the visualization of the various hierarchical items, beginning with the least anxiety-producing, while at the same time using the coping skill of relaxation to relax away any experienced tension or anxiety.

Each subject was instructed to signal the counsellor by raising an index finger if any anxiety was experienced during scene visualization. If any subject signaled, the counsellor would instruct the group to continue visualization of the scene and to simultaneously reduce the tension or anxiety. To facilitate this process, subjects were encouraged to imagine themselves reducing the tension in the situation itself. When subjects had successfully diminished the anxiety, they were told to continue visualization and to signal the counsellor by

raising their hands. If for any reason a subject wanted a scene terminated, he was instructed to wave his hand. Relaxation induction, like the counterconditioning treatment, included the introduction of the letting go or releasing procedures of relaxation training. Relaxation training and induction required 15-20 minutes to complete.

After all students were deeply relaxed, the first three scenes from the heirarchy were presented, following closely the procedures for timing and scene presentation used by Goldfried (1973). When no anxiety was signaled, each scene was presented for 30 seconds. If anxiety was signaled the scene was presented for a maximum of 90 seconds - during which time subjects were to relax away any experienced tension. If all subjects signaled success in the use of relaxation, then the scene was terminated 20 seconds after the last subject signaled or when the 90 second time limit had elapsed - whichever occurred first. Twenty to 30 seconds of counsellor presented relaxation instructions occurred between each scene presentation of the same item, with one minute of relaxation instructions between different items. The criteria for ascending to the next scene of the hierarchy were two successive presentations of 30 seconds each (no anxiety signaled). As in the counterconditioning treatment, a maximum of six

presentations per scene were allowed. A minimum of three and a maximum of five items were presented each session. Each session began with the last successfully presented scene from the previous session and terminated with two successful presentations of a scene.

Following the successful presentation of the first three scenes, the remainder of the session was devoted to the use of relaxation in vivo. Subjects were encouraged to practice their relaxation coping skills in vivo at least once daily. They were encouraged to use relaxation for any situations where anxiety or tension was experienced, and not to restrict themselves to just those situations included in the hierarchy. Subjects were forewarned that some difficulties might be experienced, especially in those situations where the anxiety was strong. Subjects were encouraged to view any difficulties as challenges for continued practice in using relaxation. In addition to using relaxation in vivo, self-control subjects were requested to continue with their between sessions relaxation practice.

Sessions 5 through 8 followed approximately the same time schedule as the counterconditioning treatment, with the first 5-10 minutes devoted to discussion and reinforcement of relaxation practice and, in the case of self-control desensitization, the use of relaxation in vivo.

The next 10-15 minutes were used for inducing relaxation, followed by scene presentations and a discussion of students' reactions to desensitization. Like the counterconditioning procedure, relaxation training in session 5 used the tensing and releasing method followed by the letting go or releasing of the various muscle groups. Relaxation was induced with verbal assistance from the counsellor. Relaxation training for the last 3 sessions involved the use of the letting go or releasing procedure followed by the tension-release method for problem muscle groups. Relaxation was primarily student induced, with counsellor assistance provided for the last 2 minutes of relaxation.

No-treatment control. Students in the no-treatment control were told that all the groups were full and that their treatment would be delayed until the next academic session (a delay of approximately 8 weeks). Control subjects were involved only in the pretest and posttest assessments, which were described as the requirements necessary for participation in the study. At the beginning of the next academic session, control subjects were contacted and offered treatment (self-control desensitization). Seven subjects accepted treatment; an additional subject had received professional counselling since the posttest period.

Design

The overall experimental design was a three group pretest-posttest control group design on three measures

(TAS, IPAT, FSS) and a posttest only design for the three other measures (Brown Digit Symbol Test, WPT, Osterhouse Test Anxiety Scale) (Campbell & Stanley, 1966). Subtracting the pre-treatment scores from the post-treatment scores for the three self-report inventories provided an estimate of the amount of change in the different group conditions. Delaying counselling in the no-treatment control condition provided a baseline to assess the effectiveness of the two treatment procedures, and allowed for comparison of the three group conditions on two performance measures and one measure of test anxiety specific to a test-taking situation.

Chapter IV

Results

An one-way analysis of variance on pretest scores showed no significant difference among the three groups on self-reported test anxiety (TAS), general anxiety (IPAT), and nontargeted anxieties (FSS), indicating that the three groups were comparable before treatment. Group means and standard deviations for these pretest scores are presented in Table 1. Table 2 presents the analysis of variance results.

As recommended by Cronbach and Furby (1970), analysis of covariance was used to assess change over the treatment interval, with subjects' pretest scores used as the covariate on posttest scores to control for any initial differences among the group conditions. The results showed that overall treatment effects were significant for the TAS, $F(2,24) = 9.25$, $p < .002$, the IPAT, $F(2,24) = 3.46$, $p < .05$, and the FSS, $F(2,24) = 10.34$, $p < .002$. These results are presented in Table 3. Post hoc comparisons between group conditions on each of these measures were made by Newman-Keuls analyses of the adjusted posttreatment means as described by Winer (1962). Adjusted posttreatment means are presented in Table 4.

Comparisons between group conditions on the TAS using Newman-Keuls analyses showed that the counterconditioning and self-control desensitization groups reported

significantly less test anxiety than the delayed-treatment control group, q_r (2,24) = 12.13, $p<.01$ and q_r (2,24) = 9.23, $p<.01$, respectively. There was no sigificant difference between the two desensitization conditions. On the FSS, both counterconditioning and self-control desensitization decreased nontarget anxieties significantly more than the control group, q_r (2,24) = 53.15, $p<.01$ and q_r (2,24) = 33.74, $p<.05$, but again did not differ from one another. There was no significant difference between counterconditioning desensitization and the control group, and between the two desensitization conditions on the IPAT measure of general anxiety. The self-control desensitization group reported less general anxiety than the control group, although this difference failed to achieve statistical significance, q_r (2,24) = 12.79, $p<.06$

One-way analysis of variance was conducted for each of the posttest only measures, with no significant differences existing among the three group conditions for the Brown and Wonderlic performance measures. For the Osterhouse Test Anxiety Scale a significant treatment effect was found, $F(2,25) = 3.72$, $p<.05$. Group means and standard deviations for the three posttest only measures are presented in Table 5, with analysis of variance results displayed in Table 6. Post hoc comparisons on the Osterhouse Test Anxiety Scale, using Newman-Keuls analyses, failed to reveal a significant difference between any of the group conditions.

Table 1

Means and Standard Deviations for the Three Pre-Posttest Measures

Groups	Measures					
	TAS		IPAT		FSS	
	Pre	Post	Pre	Post	Pre	Post
Counterconditioning						
Mean	30.0	16.8	38.6	31.8	214.6	178.3
S.D.	2.0	6.6	11.7	13.4	36.0	49.7
Self-control						
Mean	29.6	19.5	41.2	30.5	211.0	194.2
S.D.	3.6	6.5	6.7	14.0	32.4	46.7
Control						
Mean	27.8	27.5	40.4	42.8	202.9	220.2
S.D.	1.9	5.2	7.7	9.7	47.2	39.8

Table 2

Analysis of Variance of the Pretest Scores
On the Three Pre - Posttest Measures

Source	df	SS	MS	F	P
	Test Anxiety Scale				
Between	2	27.07	13.54	1.97	.160
Within	25	171.60	6.86		
	IPAT Anxiety Scale				
Between	2	30.71	15.36	0.19	.827
Within	25	2007.96	80.32		
	Fear Survey Schedule				
Between	2	695.00	347.50	0.22	.801
Within	25	38891.00	1555.64		

Table 3

Analysis of Covariance of the Scores
On the Three Pre - Posttest Measures

Source	Adjusted df	Adjusted SS	Adjusted MS	F	P
	Test Anxiety Scale				
Between	2	667.19	333.59	9.25	.001
Within	24	865.54	36.06		
	IPAT Anxiety Scale				
Between	2	858.60	429.30	3.46	.048
Within	24	2976.65	124.02		
	Fear Survey Schedule				
Between	2	13588.23	6794.11	10.34	.001
Within	24	15768.28	657.01		

Table 4

Adjusted Posttreatment Means for the Three Pre - Posttest Measures

Groups	TAS	IPAT	FSS
Counterconditioning	16.27	32.85	173.17
Self-control	19.17	29.81	192.58
Control	28.40	42.60	226.32

Table 5

Means and Standard Deviations for the Posttest Measures

Groups	Measures		
	Brown	Wonderlic	Osterhouse
Counterconditioning			
Mean	54.4	24.4	26.4
S.D.	10.7	5.3	8.7
Self-control			
Mean	58.8	27.4	26.7
S.D.	9.2	5.8	5.9
Control			
Mean	57.8	25.9	36.7
S.D.	9.3	7.2	12.0

Table 6

Analysis of Variance of the Scores on the Posttest Measures

Source	df	SS	MS	F	P
	Brown Digit Symbol Test				
Between	2	97.12	48.56	0.51	.608
Within	25	2396.75	95.87		
	Wonderlic Personnel Test				
Between	2	40.51	20.26	0.52	.601
Within	25	977.34	39.09		
	Osterhouse Test Anxiety Scale				
Between	2	654.83	327.42	3.72	.038
Within	25	2201.88	88.08		

It should be pointed out that experts disagree as to whether analysis of variance (ANOVA) or analysis of covariance is the more appropriate statistical test for a pretest-posttest control group design. Cronbach and Furby (1970) argue that even when subjects are assigned to treatments in a random or stratified-random manner, the pretest scores will still vary within each group. There does not need to be a significant statistical difference among pretest scores for those scores to vary. They assert that analysis of covariance is a desirable test since it takes this pretest variation into account. Cochran (1957) contends that analysis of covariance increases precision in randomized experiments. According to Cochran, analysis of covariance "removes the effects of an environmental source of variation that would otherwise inflate the experimental error" (p. 263) an inflation that leads to an erroneous underestimation of the F value. The environmental source of variation refers to the initial or pretest differences that exist among subjects - individual differences that are permanent enough to exist during treatment. Adjustment of the posttest scores for their regression on the pretest scores removes the effects of this initial variance from the experimental error, to the extent that these effects are influenced by the linear regression of pretest to posttest scores. Cochran's assertions concerning the appropriateness of analysis of

covariance are supported by Huck and McLean (1975) who state that

> When pretest scores are available...one would be ill-advised to disregard the pretest data because they can and should be used to (a) adjust the posttest means to account for initial differences between the treatment groups and (b) increase the power of the analysis by reducing the within-group variability (p.513).

Huck and McLean also argue that the repeated measures ANOVA is too conservative, since that test is based on an incorrect linear score model which leads to an underestimation of the F value for the between subjects main effect.

Additional support for the appropriateness of analysis of covariance for a pretest-posttest design is available in the research literature. A number of similarly designed studies concerned with anxiety reduction have used analysis of covariance as a test of statistical significance (Deffenbacher & Payne, in press; Denney, 1974; Johnson & Sechrest, 1968; Osterhouse, 1972; Russell, Miller, & June, 1975).

Chapter V

Discussion

Both counterconditioning and self-control desensitization produced significant reductions in targeted and nontargeted anxieties. The finding that both treatment methods led to significant reductions in self-reported test anxiety, as measured by the TAS, provides support for the effectiveness of each within a group counselling format. The significant reduction of self-reported test anxiety for Wolpe's approach is consistent with the vast majority of research concerned with the efficacy of systematic desensitization, while the effectiveness of Goldfried's approach provides support for this relatively new anxiety-reduction procedure.

Both methods were successful in the reduction of nontargeted anxieties, with an overall treatment effect obtained for general anxiety. Self-control desensitization produced significant reductions in nontargeted anxieties and approached significance in the reduction of general anxiety. Such findings are consistent with Goldfried's view of desensitization as a procedure whereby the client learns a general anxiety-coping skill. A surprising result was that counterconditioning desensitization significantly reduced nontargeted anxieties as measured by the FSS. If, as Wolpe contends, desensitization is a procedure that substitutes relaxation as the response to a specific category of stimuli, then reduction of nontargeted anxieties would not be expected. Anxiety reduction would

be expected for the targeted anxiety for which anxiety was deconditioned, but reduction would not be expected for anxieties not associated with the set of specific stimuli used in the hierarchy. Such findings are inconsistent with Wolpe's theoretical model of systematic desensitization and the prediction of that model with regards to treatment generalization.

As in the Paul and Shannon (1966) study, a number of subjects in the Wolpian condition volunteered unsolicited comments during group treatment regarding their use of relaxation as a general coping skill. At least one subject in each of the counterconditioning groups stated that relaxation was utilized in various life situations to cope with experienced tension and anxiety. This perception of relaxation as a general anxiety-coping skill provides additional support for Goldfried's conceptualization of systematic desensitization.

Goldfried's explanation of systematic desensitization as training in a general anxiety-coping skill is supported from the finding that both treatment conditions of systematic desensitization produced significant reductions in both targeted and nontargeted anxieties, with a difference approaching significance for the self-control condition in the reduction of general anxiety. The present study supports the prediction of the self-control model with regards to treatment generalization.

The finding that there was no significant difference between the two procedural models in treatment effectiveness indicates that the present study did not find Goldfried's modified procedure to be an improvement over standard or Wolpian systematic desensitization. Zemore (1975) also found that Goldfried's modified procedure failed to result in increase effectiveness in anxiety reduction. Although there was no difference between the two treatments, the effectiveness of Goldfried's procedure, which involved continual visualization of an hierarchical item even when anxiety was experienced, failed to support Wolpe's contention that such a procedure would lead to increased sensitization of anxiety.

The failure of Goldfried's modified procedure to improve the effectiveness of systematic desensitization may be due to a number of factors. The results indicate that Goldfried appears to be correct in his theoretical conceptualizations of desensitization as a process whereby clients learn a general anxiety coping skill, but the lack of superior effectiveness for his procedure may suggest, according to Zemore (1975), that "Goldfried has not identified the specific skills that account for the effectiveness of systematic desensitization" (p.161). There may well be more involved in the effectiveness of desensitization than just the teaching of clients to respond to proprioceptive cues with the skills of relaxation.

Two aspects of the present study may also account for the lack of superiority for Goldfried's procedures. First, some difficulty may have been experienced in using a common multi-theme hierarchy within a group format. The use of mean rankings and the discarding of extreme items in hierarchy construction could have resulted in a less than directly relevant hierarchy for some subjects. This possible situation could have influenced the effectiveness of the procedure. It should be pointed out, however, that no subjects reported dissatisfaction or problems with the hierarchy used in desensitization. Secondly, with a group program limited to four weeks there may not have been sufficient time for the self-control desensitization subjects to practice and perfect the application of their newly acquired anxiety-coping skills. Perhaps with more practice these subjects would have become more proficient in coping with anxiety and significantly less anxious than the counterconditioning subjects. Although no follow-up data were collected in the present study, it is conceivable that continued practice would improve a subject's proficiency in the utilization of general anxiety-coping skills. A similar study by Goldfried and Trier (1974) found that subjects trained in applied relaxation as an anxiety-coping skill continued to improve over a five-week follow-up period.

The present study failed to find a significant difference among any of the group conditions for the Brown and Wonderlic performance tests. The lack of subject improvement on the two performance measures is consistent with other studies where systematic desensitization effectively reduced self-reported anxiety but failed to improve scores on performance measures (Anton, 1976; Aponte & Aponte, 1971; Cohen, 1969; Cornish & Dilley, 1973; Crighton & Jehu, 1969; Doctor, Aponte, Burry & Welch, 1970; Emery & Krumboltz, 1967; Garlington & Cotler, 1968, Lomont & Sherman, 1971). The failure of the two treatment approaches to improve test performance could be due to a possible difference in aptitude or ability that may have existed among the three group conditions. If treatment subjects were lower in ability than control subjects then such a pre-treatment difference would mask any improvement achieved as a result of treatment. The small sample size of each condition may have been insufficient to balance out aptitude differences through random sampling alone. Additional studies that equated subjects on initial ability or aptitude are needed. Another important consideration is whether subjects perceived the performance measures as being representative of actual testing situations. If some subjects failed to perceive the performance measures as such then that

perception could have led to decreased motivation and involvement which, in turn, could affect test performance and scores.

An overall treatment effect was obtained for the Osterhouse Test Anxiety Scale indicating that treatment subjects perceived the performance measures as significantly less threatening than the control subjects. As a measure of self-reported test anxiety, the Osterhouse results support the reduction of test anxiety, as measured by the TAS. Since the obtained treatment effect for the Osterhouse utilizes subjects' scores from both treatments a greater number of subjects were available (eg. 18 subjects) whereas each treatment alone was limited to nine subjects. The smaller number of subjects within each treatment could account for the failure of each to show significant reductions on the Osterhouse.

Limitations of the Present Study

Limitations of the present study should be considered since they restrict the degree to which the results may be generalized, and the interpretations that can be made. Since the present study contained very few male subjects, generalization of the results should be limited to female undergraduates. Another important limitation is that the same counsellor conducted all treatment sessions. It is therefore possible that the counsellor's characteristics influenced the treatment results. Similar studies

with different counsellors are needed to determine if treatment effects are independent of counsellor effects. Finally, an important limitation of the present study is the small number of subjects. This factor may have influenced the results obtained for some of the measures. Similar studies with larger samples are needed.

Implications for Further Research

Follow-up studies are required to determine whether self-control desensitization subjects improve and eventually surpass counterconditioning subjects in anxiety reduction as a result of continued practice. In addition, such studies may provide valuable information concerning the stability of the obtained anxiety-reduction results. Although follow-up studies are available for the Wolpian approach (Paul, 1968; Taylor, 1971), similar studies for Goldfried's procedure are lacking. Only indirect support from the Goldfried and Trier (1974) study in applied relaxation is available as support for Goldfried's procedure over time.

An important area for further research is comparative studies between the two models where different steps of the counselling procedures are varied to determine what effect, if any, each has on treatment effectiveness and generalization. For example, would a single

theme hierarchy prove to be effective in both targeted anxiety reduction and treatment generalization for the Goldfried model. If so, then the use of such an hierarchy would simplify the application of Goldfried's procedure within a group format.

A practical limitation of Goldfried's procedure is that little attempt is made in providing clients with skills which directly facilitate the use of relaxation as a coping skill. While the treatment rationale emphasizes the use of relaxation as a coping skill and while desensitization of hierarchy items are seen as opportunities to practice and perfect these skills, no direct attempt, other than what the client picks up in relaxation training, is made to provide the client with self-control relaxation skills. An important focus for further studies would be to utilize specific self-control techniques in Goldfried's model in order to assess whether such modifications would improve the procedure's efficacy. Goldfried's procedure could be combined with cue-produced relaxation procedures (Cautela, 1966) or with one or more of the procedural steps commonly used in relaxation as self-control studies (Deffenbacher & Payne, in press; Deffenbacher & Snyder, 1976; Sherman & Plummer, 1973), such as discrimination training designed to facilitate greater awareness of personal cues of tension, and application training which consists of various methods designed to promote rapid self-induction of relaxation.

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Appendix A

If after filling in the Test Anxiety Scale you feel you have a significant anxiety problem with regards to tests or examinations, and would like to receive some assistance with this, please fill in the following:

NAME: _____

PHONE: _____

CLASS STANDING: 1st yr.___ 2nd yr.___ 3rd yr.___

4th yr.___ Other___

COURSE AND NUMBER: _____

A small group program to assist people with test anxiety will be offered in a few weeks. It will meet for approximately an hour for 6 to 8 times.

Appendix B

NAME:_____

SEX:_____

COURSE:_____

Instructions:

This instrument is composed of 37 items regarding your feelings and reactions to taking tests. There are no right or wrong answers to these questions. We are interested in how you personally react to testing or exam situations. Mark the items below with either a T for true or a F for false depending on whether the item applies to you or not. Try to decide "true" or "false" on the basis of what is most typical or most representative of your reactions. Then enter the appropriate mark in the blank before each question.

This information is completely confidential and will not be made known to your instructors. Work quickly and don't spend much time on any one question. Now go ahead, work quickly and remember to answer every question.

TEST ANXIETY SCALE

___ 1. I seem to defeat myself while working on important tests.

___ 2. While taking an important exam I find myself thinking of how much brighter the other students are than I am.

___ 3. The harder I work at taking a test, or studying for one, the more confused I get.

___ 4. As soon as an exam is over I try to stop worrying about it, but I just can't.

___ 5. If I were to take an intelligence test, I would worry a great deal before taking it.

___ 6. During exams I sometimes wonder if I'll every get through college.

___ 7. I would rather write a paper than take an examination for my grade in a course.

___ 8. I wish examinations did not bother me so much.

___ 9. I think I could do much better on tests if I could take them alone and not feel pressured by a time limit.

___ 10. Thinking about the grade I may get in a course interferes with my studying and my performance on tests.

___ 11. If examinations could be done away with I think I would actually learn more.

___ 12. On exams I take the attitude, "If I don't know it now, there's no point worrying about it".

____ 13. If I knew I was going to take an intelligence test, I would feel confident and relaxed beforehand.

____ 14. I really don't see why some people get so upset about tests.

____ 15. Thoughts of doing poorly interfere with my performance on tests.

____ 16. Even when I'm well prepared for a test, I feel very anxious about it.

____ 17. I don't enjoy eating before an important test.

____ 18. While taking an important examination, I perspire a great deal.

____ 19. Before an important examination I find my hands or arms trembling.

____ 20. During course examinations, I find myself thinking of things unrelated to the actual course material.

____ 21. I seldom feel the need for "cramming" before an exam.

____ 22. The University ought to recognize that some students are more nervous than others about tests and that this affects their performance.

____ 23. I get to feel very panicky when I have to take a surprise exam.

____ 24. During tests, I find myself thinking of the consequences of failing.

____ 25. It seems to me that examination periods ought not to be made the tense situations which they are.

____ 26. After important tests I am frequently so tense that my stomach gets upset

____ 27. I start feeling very uneasy just before getting a test paper back.

____ 28. I dread courses where the professor has the habit of giving "pop" quizzes

____ 29. I freeze up on things like intelligence tests and final exams.

____ 30. Getting a good grade on one test doesn't seem to increase my confidence on the second.

____ 31. I sometimes feel my heart beating very fast during important tests.

____ 32. After taking a test I always feel I could have done better than I actuall did.

____ 33. I usually get depressed after taking a test.

____ 34. I have an uneasy, upset feeling before taking a final examination.

____ 35. When taking a test, my emotional feelings do not interfere with my performance.

____ 36. During a course examination, I frequently get so nervous that I forget facts I really know.

____ 37. I don't study any harder for final exams than for the rest of my course work.

(FSS)

NAME: _____

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. Looking down from high buildings					
20. Worms					
21. Imaginary creatures					
22. Strangers					
23. Receiving injections					
24. Bats					
25. Journeys by train					
26. Journeys by bus					
27. Journeys by car					
28. Feeling angry					
29. People in authority					
30. Flying insects					
31. Seeing other people injected					
32. Sudden noises					
33. Dull weather					
34. Crowds					
35. Large open spaces					
36. Cats					
37. One person bullying another					
38. Tough looking people					

	Not At All	A Little	A Fair Amount	Much	Very Much
39. Birds					
40. Sight of deep water					
41. Being watched working					
42. Dead animals					
43. Weapons					
44. Dirt					
45. Crawling insects					
46. Sight of fighting					
47. Ugly people					
48. Fire					
49. Sick people					
50. Dogs					
51. Being criticized					
52. Strange shapes					
53. Being in an elevator					
54. Witnessing surgical operations					
55. Angry people					
56. Mice					
57. Blood a - Human b - Animal					
58. Parting from friends					
59. Enclosed places					
60. Prospect of a surgical operation					
61. Feeling rejected by others					
62. Airplanes					
63. Medical odors					
64. Feeling disapproved of					
65. Harmless snakes					
66. Cemeteries					
67. Being ignored					
68. Darkness					
69. Premature heart beats (Missing a beat)					
70. Nude Men (a) Nude Women (b)					
71. Lightning					
72. Doctors					
73. People with deformities					
74. Making mistakes					
75. Looking foolish					
76. Losing control					
77. Fainting					
78. Becoming nauseous.					
79. Spiders					
80. Being in charge or responsible for decisions					
81. Sight of knives or sharp objects					
82. Becoming mentally ill					
83. Being with a member of the opposite sex					
84. Taking written tests					
85. Being touched by others					
86. Feeling different from others					
87. A lull in conversation					

(Drum) Please check: ___ Right-hand ___ Left-hand

FORM E Name _____

CODE

19	24	47	78	84	87	94
						

PRACTICE

19	24	47	24	78	24	84	94	87	19
									

94	84	87	78	84	24	19	87	78	94	84	87	19	47	84	24	19	87	78	84

87	47	94	87	78	94	84	24	87	94	24	47	24	94	78	19	94	78	47	24

19	47	87	84	24	94	19	24	78	84	87	78	19	84	78	94	87	94	47	94

19	87	24	84	19	78	84	94	87	94	19	87	24	84	19	78	19	87	24	47

19	47	94	78	47	94	24	87	24	84	94	24	78	47	84	78	87	47	84	24

84	24	19	47	94	78	84	78	87	84	47	94	24	19	94	24	87	84	78	19

Directions:

Read each of the following statements carefully. In the space before each item, indicate how you actually felt during the test you just took. Use the following scale:

1. The statement did not describe my feeling or condition.
2. The feeling or condition was barely noticeable.
3. The feeling or condition was moderately intense.
4. The feeling or condition was strong.
5. The feeling or condition was very strong.

___ 1. I felt panicky while taking this examination.

___ 2. I felt during this examination that I wouldn't be able to finish the examination on time.

___ 3. My mouth got dry during this examination.

___ 4. Prior to taking this examination, I felt that other students were better prepared for this examination than I was.

___ 5. My mind went blank at the beginning of this examination. It took me a few minutes to function.

___ 6. I feel that I let myself and other persons down by my performance on this examination.

___ 7. I felt my heart beating fast during this examination.

___ 8. I found myself worrying about a low score before this examination.

___ 9. During this examination, I found myself thinking about the consequences of doing poorly.

___ 10. I got so tense during this examination that my stomach became upset.

___ 11. After finishing this examination, I feel that I could have done better than I actually did.

___ 12. I got a headache during this examination.

___ 13. While taking this examination, I found myself thinking of how much brighter other students are than I am.

___ 14. My hands perspired during this examination.

___ 15. I did not feel very confident of my performance before I took this examination.

___ 16. I got so nervous during this examination that I forgot facts which I really knew.

Appendix C

Brown-Wonderlic Intelligence Test

(Please do not turn the page until told to do so)

The questions on this and the following test together comprise a very sensitive measure of general intelligence and problem solving ability. From your performance on these two timed tests, we will obtain an IQ score measuring your level of general intellectual problem solving ability. You should work as fast as you can and get a many items correct as is possible in the time allowed. Your score is based on the number of items answered correctly. Each item you miss or answer incorrectly lowers your score when it is compared with the scores of other students.

This test of general intelligence and problem-solving ability is composed of two tests. Do not proceed to the first test until instructed to do so by the examiner. After completion of the first test, the examiner will hand out the second test along with the necessary instructions.

Appendix D

Relaxation Materials and Procedures

Relaxation is an important part of our counselling process. You are asked to practice relaxation at least once and preferably twice daily. This sheet of materials should aid you in your practice.

You should try to make the relaxation practice parallel your experience here in the counselling session. Choose a place which is dimly lighted and where you will be undisturbed for the period while relaxing. Pick a place which will leave your body as supported and tension-free as possible. Beds, couches, or cushions spread on the floor are good support systems for people relaxing in a horizontal position. Recliner chairs, large overstuffed chairs, or two chairs, one to sit on with your head resting back against the wall and the other to support your legs, are good ways for people who are relaxing in a sitting position. If you find a good system, stay with it. If you continually fall asleep, change your positioning and/or time of day for relaxation practice.

Your tension-relaxation procedure should follow the one you learned here. You should tense each muscle group in the way and the order which you experienced them. Tense each one for 5 to 10 seconds; then give yourself 10 to 20 seconds to continue releasing and relaxing. Think about relaxing each muscle group a little more and consciously release each a little more. At various points you should go back over and review the various muscle groups and let each go a little more, e.g., after your arms, after your neck and head area, after your chest and stomach area, and after your legs are finished. Arouse yourself thoroughly the same as in counselling by counting backwards from 5 to 1.

When practicing, you should not practice for more than about 25 minutes at a time. This should give you time enough to tense and release each muscle group once and hit two or three times those special muscle groups in which you experience tension the most. It is best not to practice the relaxation exercises twice in the same three hour period.

To help you remember the tension-release exercises, you will find on the next page a list of the muscle groups in order and the methods for tensing them. Tense each group hard, but not to the point of cramping. Repeat any group in which you feel excessive tension. You will probably find that you have a few areas in which you experience most of your tension; these are the areas that you probably will want to repeat.

Muscle groups and exercises:

1. Hands by clenching them.
2. wrists and forearms by extending them and bending the hands back at the wrists.
3. biceps and upper arms by clenching your hands into fists, bending your arm at the elbows, and flexing your biceps.
4. shoulders by shrugging them.

(review back over the arms and shoulders area)

5. forehead by wrinkling it into a deep frown.
6. around the eyes and bridge of the nose by closing the eyes as tightly as possible (contact lens should be removed before beginning the exercises)
7. cheeks and jaws by grinning from ear to ear.
8. around the mouth by pressing the lips together tightly.
9. back of the neck by pressing the head back hard.
10. front of the neck by touching the chin on the chest.

(review the neck and head area)

11. chest by taking a deep breath and holding it, then exhaling.
12. back by arching the back up and away from the support surface.
13. stomach by sucking it in as far as possible.

14. stomach by forming it into a tight knot.

(review the chest and stomach area)

15. hips and buttocks by pressing the buttocks together tightly.
16. thighs by clenching them hard.
17. lower legs by pointing the feet back towards the face, like trying to bring the toes up to touch the knees.
18. lower legs by pointing the toes away and curling the toes downward at the same time.

(review the area from the waist down)

Check with your counsellor at the next session if there are any questions or problems.

Relaxation Record

Name: _____

Directions: Please note below the amount of time spent in practicing muscle relaxation.

Day	Date	Time Spent	Comments: (Any difficulties? How well w you able to relax?)

Appendix E

Counterconditioning Desensitization Test Anxiety Hierarchy

In order of increasing anxiety, the test anxiety hierarchy was as follows:

1. You are sitting in one of your classes. The instructor announces that you will have a major examination in two weeks.

2. You are in your place of study. You are reading and studying for the exam which is a week away.

3. It is two days before the exam. You are in your usual place of study and are preparing for the upcoming exam.

4. It is the night before the major exam. You are in your place of study and are studying for the exam.

5. It is the day before the exam. You are talking to one or two students who tell you how much preparation they have done for this exam. You have spent much less time on the readings.

6. It is the day of the exam. You are now walking on your way to the exam.

7. You are standing outside the test room and are talking with others gathered there.

8. You are leaving the classroom and are talking with other students about the exam. Some of their answers do not agree with yours.

9. You are sitting in the exam room waiting for the exam to be passed out.

10. It is the day of the exam. It is one hour before the test and you are looking over your notes. As you review your notes, you realize that you have become confused and have forgotten some things. You wonder whether you should continue reviewing your notes or just put them aside.

11. While the test is being passed out, you think about not being adequately prepared.

12. While waiting for the exam to be passed out, you hear a student ask a question which you cannot answer.

13. While taking the test, you come to a question which you are unable to answer. You draw a blank.

14. You are taking the important exam. As you read over your examination, you realize that many of the items are difficult. You look up from your test, wondering where to start, and notice everyone around you writing rapidly.

15. You are in the important exam. The instructor announces that 30 minutes remain, but you have an hour's worth of work left.

16. You are in the important exam. The instructor announces that 15 minutes remain, but you have an hour's worth of work left.

Appendix F

Self-Control Desensitization Multithematic Hierarchy

In order of increasing anxiety, the multithematic hierarchy was as follows:

1. You are walking into a classroom of a course which you have just started to take. You look about and realize that you do not know anyone in this class.

2. You are sitting in one of your classes. The instructor announces that you will have a major examination in two weeks.

3. It is two days before the exam. You are in your usual place of study and are preparing for the upcoming exam.

4. You have just arrived at a party. You realize, that with the exception of the host who is an acquaintance of yours, everyone at this party is a stranger to you.

5. It is the night before the major exam. You are at your place of study and are studying for the exam.

6. It is the day of the exam. You are now walking on your way to the exam.

7. You are in a discussion group of 8 to 10 people - none of whom you know. The group is quiet and seems a bit nervous. The instructor is going around the group asking each person in turn one or two questions about the course material. You are next in line.

8. You have an oral presentation to give to a class of 50 to 80 students who are the same age as you or older. You are now practicing your oral presentation alone in your room the night before.

9. You are sitting in the exam room waiting for the exam to be passed out.

10. While the test is being passed out, you think about not being adequately prepared.

11. You are having a disagreement with another person. This person becomes angry and critical towards you, saying loudly "Why don't you shut up! You don't know what the hell you're talking about!"

12. You are in a class of about 80 to 100 students and you wish to ask a question, but you know that the instructor tends to be arrogant and critical. You are unsure about how to word your question.

13. You are taking the important exam. As you read over your exam, you realize that many of the items are difficult. You look up from your test, wondering where to start, and notice everyone else around you writing rapidly.

14. While taking the test, you come to a question which you are unable to answer. You draw a blank.

15. You are writing the important exam. The instructor announces that 15 minutes remain, but you have an hour's worth of work left to do.

VITA

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Title of Thesis/Dissertation

Comparison of Counterconditioning and Self-Control Models of Systematic Desensitization in Test Anxiety Reduction and Treatment Generalization

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