

GROUP IMPLOSIVE THERAPY IN THE TREATMENT  
OF TEST ANXIETY

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The problem of this study was to investigate the application of group implosive therapy in the reduction of test anxiety.

Thirty-six undergraduate students were selected to participate in the study on the basis of their scores on the Test Anxiety Questionnaire. They were then randomly assigned to one of the following three groups: (1) implosive therapy, (2) placebo-attention, and (3) no-treatment control. All treatment was carried out by the same therapist.

The implosive therapy group received five thirty-minute sessions of treatment over a two and one-half week period. A rationale for implosive therapy was presented by the therapist to the subjects. The remainder of the first session was spent in having the subjects close their eyes and visualize scenes from a hierarchy of anxiety-eliciting items associated with tests and examinations. To aid in their visualization of the stimuli and to help them experience the accompanying anxiety, detailed verbal instructions were presented by the therapist. The group was instructed to visualize and imagine the stimuli presented and to concentrate on experiencing the anxiety elicited as intensely as possible. The signal that the subjects used to indicate that they were experiencing anxiety was the raising of the

left index finger. Lowering of this finger indicated that they could no longer experience anxiety. Two scenes were presented in each session. The goal of treatment was to extinguish anxiety associated with taking tests. Following the completion of the five treatment sessions, the Test Anxiety Questionnaire was readministered. One month later, the follow-up Test Anxiety Questionnaire was administered.

The placebo-attention group met for the same period of time and under similar conditions as the implosive therapy group. A rationale similar to that presented to the implosive therapy group was presented to the group. The subjects were then instructed to close their eyes and visualize scenes from a list of non-relevant items. Two scenes were presented in each of the five treatment sessions. Detailed verbal instructions were presented by the therapist to aid the subjects in their visualization of the stimuli. Following the completion of the last session, the Test Anxiety Questionnaire was readministered to the subjects. One month later, the follow-up Test Anxiety Questionnaire was administered.

Following their assignment to the control group, the subjects were asked to return in three weeks' time. No additional information was given to them. They were given the post-treatment and follow-up Test Anxiety Questionnaire at approximately the same time as the two other groups.

The analysis of the results failed to support the major hypothesis that there would be a significant mean difference between the implosive

therapy group and both the placebo-attention and no-treatment control groups on the Test Anxiety Questionnaire following treatment. There were, however, indications that group implosive therapy is a useful technique in the reduction of test anxiety. A significant difference at the .05 level was obtained between the implosive therapy group and the no-treatment control group. There was no significant difference obtained between the implosive therapy and placebo-attention groups. The difference obtained was in the expected direction. On the follow-up Test Anxiety Questionnaire administration, all three group means remained relatively the same. In addition, within-group changes produced a highly significant  $t$  value ( $P=.002$ ) for the implosive therapy group. No significant within-group changes occurred in the two control groups.

GROUP IMPLOSIVE THERAPY IN THE TREATMENT  
OF TEST ANXIETY

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## CHAPTER I.

### INTRODUCTION

Anxiety is the major component of most emotional and behavioral disorders. The goal of various psychotherapeutic techniques is almost invariably either directly or indirectly aimed at the reduction or alleviation of anxiety. In our increasingly complex society, there is a need for the development of effective means of treating anxiety. Numerous researchers (6, 10, 11) have documented the debilitating effects of anxiety. The growing demand for the services of psychiatrists, psychologists, counselors, and related personnel warrants the search for shorter and more efficient therapeutic techniques of treating anxiety. This need justifies the careful investigation of any technique that appears promising.

Test anxiety is a pervasive problem that educators and psychologists encounter at all educational levels. The symptoms of test anxiety vary from mild discomfort to severe anxiety associated with test-taking activity. Many students experience fear of failing examinations and in giving reports in class. Eysenck and Rachman (5) reported that fear of some aspect of school appears in 44 to 90 per cent of sixth grade pupils, and that 20 per cent of school children experience some type of test anxiety. Test anxiety is a particularly serious problem at the college level, where grades are considered by

many students and faculty members to be of prime importance.

A promising avenue in the treatment of test anxiety appears to be the use of behavior therapy techniques. Desensitization (14) and implosive therapy (12), or related techniques such as reactive inhibition (8), have been found to be effective in reducing conditioned anxiety. Desensitization has successfully been applied in reducing anxiety in individual and group treatment of test anxiety (3, 4, 13). Implosive therapy and related techniques are of fairly recent origin. They have been reported in published research to be effective in reducing conditioned anxiety. Malleon (8) treated a case of examination panic by reactive inhibition, a technique very similar to implosive therapy. Calef and MacLean (2) applied a group-reactive inhibition technique in the successful treatment of anxiety associated with public speaking. However, a review of the literature to date indicates that implosive therapy, or any related technique such as reactive inhibition, has not been used to treat test anxiety in a group setting.

Implosive therapy is generally an expedient and efficient treatment procedure when compared to other therapeutic approaches. Only a brief period of time, usually averaging from one to five treatment sessions, is required to alleviate the unadaptive anxiety. Other approaches require considerably more time. The behavioristic technique of desensitization generally requires a minimum of ten treatment sessions (15). It was determined that if implosive therapy can be found to be effective in reducing test anxiety when it is applied

in a group setting, it will provide a more efficient method for treating a large number of test anxious subjects.

#### Statement of the Problem

The problem was the application of group implosive therapy in the treatment of test anxiety.

#### Purposes of the Study

1. Determine the level of test anxiety present, as measured by the Test Anxiety Questionnaire (TAQ), prior to treatment.
2. Develop an implosive therapy procedure to reduce test anxiety.
3. Administer implosive therapy to subjects in the experimental treatment group.
4. Determine the post-treatment level of test anxiety in the implosive therapy group, placebo-attention control group, and the no-treatment control group.
5. Determine if there were any significant differences in the test anxiety levels in the three groups on the post-treatment TAQ.
6. Investigate the results of a one month follow-up administration of the TAQ to determine the relative stability of test scores.

#### Hypotheses

The following hypotheses were formulated:

1. Subjects participating in group implosive therapy will show a significant mean decrease on the score obtained on the TAQ when compared to the placebo-attention control group and the no-treatment control group.

2. There will be no significant difference between the placebo-attention control group mean and the no-treatment control group mean as measured by the post-treatment administration of the TAQ.

3. There will be no significant difference between the group implosive therapy mean on the TAQ obtained on the post-treatment administration with that obtained on a one month follow-up administration.

4. There will be no significant difference between the placebo-attention control group and the no-treatment control group mean scores obtained on the post-treatment and one-month follow-up administrations of the TAQ.

#### Limitations

Due to the difficulty involved in scheduling subjects, the treatment was carried out in five thirty-minute sessions spaced over a three-week period. The implosive therapy group and the placebo-attention group met at different times on Monday and Thursday afternoons. This procedure is consistent with other research studies employing implosive therapy (1, 2).

#### Definition of Terms

1. Implosive therapy is a process by which learned fears are extinguished by presentation of the conditioned stimulus in the absence of its unconditioned stimulus.

2. Group implosive therapy is the application of implosive therapy in a group setting.

3. Desensitization is a process by which learned fears are extinguished by counterposing relaxation in place of anxiety.

4. Group desensitization is the application of desensitization in a group setting.

5. Test anxiety is operationally defined in terms of a score on the Test Anxiety Questionnaire, hereafter referred to as the TAQ. A copy of the TAQ is included in Appendix A. High test anxiety was defined as a score at or above the sixty-second percentile, a score of 212, of the scores obtained on previous normative data (7) on the population.

6. Statistical significance is defined at the .05 level.

#### Basic Assumptions

1. It was assumed that significant changes in the test scores of subjects in the implosive therapy group would be due to the application of implosive therapy and not to any extraneous factors.

2. It was assumed that those students who volunteered to participate in this study would be representative of the general student population who experience test anxiety.

3. It was assumed that the subjects were actually experiencing anxiety when they indicated that they were anxious.

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## CHAPTER II

### RELATED RESEARCH

#### Introduction

This chapter is concerned with the debilitating effects of test anxiety and the research pertaining to its reduction. The increasing demand for psychological counseling services in education and society in general dictates the need for developing effective short term approaches that would permit the delivery of psychotherapeutic services to a larger number of people. Group behavioristic methods offer promise of fulfilling this need.

Emery and Krumboltz noted that "little work has been done on finding an effective method to reduce students test anxiety" (8, p. 204). Suinn stated that "despite the prevalence and importance of this problem, few studies have been done on developing a means for treating test anxiety" (22, p. 385). In reference to the debilitating effects of test anxiety on the performance of students, Mann and Rosenthal stated that,

The high incidence of test anxiety and its debilitating effects on academic performance create a strong need for preventive and remedial programs. Such programs do not yet exist, in part, because effective techniques for reducing anxiety have only recently been devised (14, p. 359).

The effective techniques referred to by Mann and Rosenthal (14) are encompassed by the area of behavior therapy.



Behavior therapy is a broad term encompassing many different techniques which have their origin in the empirical psychology of learning. Two behavioristic techniques, desensitization (25) and implosive therapy (21), are alike in that they are both concerned with the reduction of unadaptive anxiety by the use of respondent techniques. Desensitization has been widely used in both the individual and group treatment of anxiety, including test anxiety. There has been a limited amount of research published concerning the use of implosive therapy in the treatment of anxiety. The research that has been published suggests that implosive therapy is a more efficient and shorter method than desensitization in the treatment of anxiety. The successful treatment of test anxiety by group desensitization raises the question of whether group implosive therapy would also be an effective method for the reduction of test anxiety.

#### Test Anxiety

Test anxiety is found to exist among a large number of college students. It is viewed as a learned inappropriate physiological reaction to the stimulus cues of the testing situation (11). Suinn described test anxiety as the experiencing of "an inability to think or remember, a feeling of tension, and difficulty in reading and comprehending simple sentences or directions on an examination" (22, p. 385).

Emery and Krumboltz presented the following paradigm based on classical conditioning to explain how students can become overly

anxious about taking examinations:

A child bringing home an examination with a grade lower than expected by his parents is likely to be punished, directly or indirectly, by his parents. The repeated associations of punishment with examinations will produce an increase in his anxiety whenever events associated with examinations occur in the future. The freshman year at college may heighten fear of examinations. An increased level of competition combined with more complex subject matter challenges many students for the first time. Thus, the test anxiety of most college students can be viewed as a fear of events associated with the testing situation (8, pp. 204-209).

Easterbrook (7) has argued that anxiety disorganizes the effective utilization of stimulus cues involved in learning and performance by a disruption and narrowing of the attention span and range as well as concomitantly limiting perceptual cue utilization. The relationship between academic performance and anxiety was noted by Spielberger and Katzenmeyer (2), who reported that students with high levels of anxiety receive lower grades and have a higher rate of failure when compared to students of similar ability with low anxiety. Albert and Haber (1) reported a significant relationship between academic performance and scores on the Test Anxiety Questionnaire (TAQ). Students with high scores on the TAQ generally had lower grade point averages than students who had low scores.

Mandler and Sarason (13) conducted a study to determine what effects high anxiety as opposed to low anxiety had on the performance of college freshmen enrolled in introductory psychology. The students were first given an anxiety questionnaire. Each section contained questions dealing with the students' subjective experiences in the testing situation, such as "uneasiness, accelerated heart beat, perspiration, emotional interference, and worry before and during a test session" (p. 167). On the basis of their questionnaire answers,

forty-two subjects with the lowest scores and twenty-one with the highest scores were then selected to participate in the study. Each of these two groups was divided by random procedure into three subgroups: (1) success, (2) failure, and (3) neutral.

The subjects were then given a series of performance tests on each of which they were given six trials. After the administration of the tests, the experimenters told the success group that they had done worse than they had been expected to do, and the experimenter asked if they would try to do better on the second half of the test. The neutral group was told only that they would now go on to the second part of the experiment. The subjects again completed six additional trials of similar performance tests.

During the testing session, the experimenter rated the subjects on a five-point scale according to five criteria of overt manifest anxiety. These criteria were as follows: (1) perspiration, (2) excessive movement, (3) inappropriate laughter and exclamations, (4) questioning of instructions, and (5) hand movements. These ratings were dichotomized into high-anxiety and low-anxiety groups, and the students' scores were compared with the questionnaire ratings that they had filled out previously. The agreement between the two sets of scores was highly significant.

The results of the analysis of the data indicated that students who had high anxiety drive in testing situations reacted to the

testing situation with a larger number of responses not relevant to the test. Additionally, students of the low-anxiety failure group achieved significantly better than the high-anxiety failure group. It can be inferred from these results that anxiety-evoking situations, such as being told that they will not do well, interferes with the performance of high-anxiety subjects; yet, at the same time, anxiety improves the performance of low-anxiety subjects.

Postman and Bruner (16) experimentally demonstrated that anxiety results in a constriction of the perceptual field. In their study, they instructed subjects to repeat words that were flashed on a screen at a speed that was too fast for very accurate recognition. The length of the exposures was gradually increased so that accurate recognition was eventually possible. The subjects were instructed to guess about the stimulus word on every exposure in which they did not recognize it. Some of the subjects were then subjected to harassment and criticism that were designed to induce a high level of anxiety. The results of their study indicated that not only was the perceptual performance of the subjects experiencing anxiety considerably poorer than that of the subjects who were exposed to the neutral conditions, but that their pre-recognition guesses also showed a considerable difference when compared with the results of the non-stressed subjects.

#### Desensitization

Desensitization is a process based on the principle of reciprocal inhibition(25), which states that no two incompatible responses can occur at the same time in any one organism. Wolpe explained this key

principle of reciprocal inhibition as,

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 the anxiety responses, the bond between these stimuli will be weakened (25, p. 71).

Desensitization is based on the learning principle of counterconditioning. Counterconditioning is the procedure by which a new conditioned response (CR), that is incompatible with the conditioned response (CR) to be eliminated, is conditioned to the conditioned stimulus (CS). When the counterconditioning is successful, the presentation of the conditioned stimulus (CS) will elicit the new conditioned response (CR) rather than the original conditioned response (CR).

Desensitization consists of the following three mutually dependent procedures: (1) training in deep muscle relaxation, (2) construction of anxiety hierarchies, and (3) counterposing relaxation and anxiety stimuli from the hierarchies. According to Wolpe,

Systematic desensitization is the piecemeal breaking down of neurotic anxiety-response habits, employing a physiological state incompatible with anxiety to a stimulus that evokes it weakly, repeating the exposure until the stimulus loses completely its anxiety-evoking ability (25, p. 54).

Treatment begins with the subject's being trained in deep muscle relaxation. Concurrent with the relaxation training, a fear hierarchy is developed in which anxiety-evoking scenes are ranked in ascending order in terms of their ability to evoke anxiety. Desensitization proper begins with the subject's being instructed to visualize the least anxiety-evoking scene from the fear hierarchy while concentrating on remaining completely relaxed. After visualizing the scene for a few

moments, the subject is instructed to stop and to concentrate on relaxation instructions given by the therapist. The subject is then instructed to visualize the next scene from the fear hierarchy while concentrating on remaining relaxed. If at any stage of the desensitization procedure the subject experiences anxiety, he is instructed to stop imagining the item from the fear hierarchy and to concentrate on deep muscle relaxation. Relaxation instructions are given until he is again completely relaxed. He is then instructed to visualize the next lowest anxiety scene from the fear hierarchy. This procedure is continued until the subject can visualize items from the entire fear hierarchy without experiencing anxiety.

The three main tasks of desensitization involve varying lengths of time. Wolpe and Lazarus (26) suggest that about twenty minutes of the first six interviews be devoted to relaxation training. This is supplemented by training at home for about fifteen minutes a day. Development of the fear hierarchy also begins at the same time as relaxation training and is subject to change at any time during the course of the treatment. Desensitization proper begins with the subject's visualizing scenes from the fear hierarchy, while being completely relaxed.

The usual duration of a desensitization treatment session is from fifteen to twenty minutes. The number of desensitization sessions necessary to reduce anxiety also varies. According to Wolpe and Lazarus, "one patient may recover in about a half dozen sessions; yet another may require a hundred or more" (26, p. 85).

Ihli and Garlington (9) found both individual and group desensitization to be successful in reducing test anxiety. They noted, however, that group desensitization takes slightly longer to accomplish than individual desensitization. In their study, both treatment groups received two thirty-minute sessions of training in muscle relaxation. These were followed by two sessions of training in visualization. Desensitization proper then followed, and required a mean of 6.25 thirty-minute sessions for the subjects individually desensitized and a mean of 7.4 sessions for those subjects who received group desensitization. Total treatment time for the individually desensitized subjects was a mean of 10.25 sessions, while the mean was 11.4 sessions for the subjects who received group desensitization. Generally, it has been found that the length of treatment time in group desensitization of test anxiety averages eight hours.

#### Implosive Therapy

Implosive therapy is a relatively new behavioral technique developed by Thomas Stampfl in 1967 (21), which applies a direct extinction procedure to the treatment of conditioned anxiety. Stampfl stated that what is necessary for effective treatment is to present conditioned stimuli in the absence of their primary reinforcement. Stampfl and Levis, in describing implosive therapy stated:

The fundamental hypothesis is that a sufficient condition for the extinction of anxiety is re-present, reinstate, or symbolically reproduce the stimuli (cues) to which the anxiety response has been conditioned, in the absence of primary reinforcement (21, pp. 498-499).

An example of this would be evident in conditioning a person to experience anxiety when a red light is turned on by associating the red light with an aversive electrical shock, and then to expose the person to the red light without the associated aversive shock, until the subject no longer experiences anxiety.

Wenrich aptly summarized Stampfl's main fundamental principle as,

If a conditioned stimulus is presented without an accompanying unconditional stimulus[or as Stampfl and Levis calls it, an accompanying primary reinforcement], an intense emotional reaction will be generated; and, with repeated presentations of these anxiety-eliciting stimuli, the reaction will subside and cease altogether (23, p. 17).

Stampfl places importance on the behavior that an organism learns in an effort to terminate fear stimuli, as is evident in escape and avoidance behavior. When exposed to a conditioned stimulus, the organism may experience fear. This fear may grow to the extent that escape or avoidance behavior is manifested. The avoidance behavior reduces the anxiety, while at the same time, strengthens the conditioned fear response. On the next exposure the organism finds it more difficult to tolerate the conditioned stimulus. In implosive therapy, the subject is encouraged not to escape or avoid the conditioned stimulus. He is instructed to experience as much anxiety as he can until the conditioned response, when followed by non-reinforcement, is extinguished.

Several factors are necessary for extinction to occur and for implosive therapy to be successful. First of all, there must be the elicitation and experiencing of anxiety by the subject in response to



the presumed anxiety-evoking stimuli presented by the therapist. Closely related to this experiencing of anxiety is the ability of the subject to vividly imagine and visualize the stimuli presented by the therapist. Thus, the elicitation of anxiety must be related to the stimuli presented by the therapist, with the stimuli being adequately visualized by the subject. As in desensitization, where success depends upon the visualization of presentations of graded items from a fear hierarchy while the subject is relaxed, implosive therapy requires the visualization of highly anxiety-evoking items from the top of the fear hierarchy, with the subject concentrating on experiencing as much anxiety as possible.

Problems arise in implosive therapy when the subject does not experience anxiety, or does not adequately visualize the stimuli being presented by the therapist. Therefore, for implosive therapy to be successful, there must be (1) adequate visualization of the highly anxiety-evoking stimuli being presented by the therapist, and (2) an intense experiencing of the anxiety being elicited. When these two factors are present, successful implosive therapy should follow. When there is a deficiency in one or the other area, there will most probably be a decrease in the effectiveness of implosive therapy. Particular care must be taken by the therapist to insure that the subject both adequately visualizes the stimuli and experiences the accompanying anxiety.

Stampfl and Levis (21), in describing the principle of implosive therapy, reviewed the earlier work of Solomon, Kamin, and Wynne, who in discussing anxiety, stated:

. . . the best way to produce extinction of the emotional response would be to arrange the situation in such a way that an extremely intense emotional reaction takes place in the presence of the conditioned stimulus. This would be tantamount to a reinstatement of the original acquisition situation, and since the unconditioned stimulus is not presented, a big decremental effect should occur (19, p. 299).

Numerous researchers have shown that extinction proceeds faster when the stimulus conditions that the organism is exposed to are very similar to those which were originally associated with the traumatic stimulation (3, 6, 24). In emphasizing the behavioral approach in implosive therapy and the relationship between the stimulus cues presented by the therapist, Stampfl and Levis stated:

. . . in the implosive procedure, the emphasis is not upon the acceptance of interpretations, but rather upon the extinction of anxiety-evoking conditioned stimuli (cues) which provide both motivational and reinforcing properties for perpetuating the patient's symptoms (avoidance responses). It would also follow from the learning model that it would be irrelevant whether or not the patient understood or accepted the significance of these cues. All that is necessary for effective treatment is to represent these conditioned cues in the absence of primary reinforcement. Since the task of accurately establishing the original conditioning cues is difficult, the presentation of hypothesized cues serves as an excellent substitute. Complete accuracy is not essential since some effect, through the principle of generalization of extinction, would be expected when an approximation is presented. The more accurate the hypothesized cues and the more realistic they are presented, the greater the extinction effect would be (21, p. 499).

Polin (15) conducted research on animals, concerning the length and intensity of conditioned stimulus presentation. Thirty rats were randomly separated into three equivalent groups: (1) control,

(2) barrier, and (3) flooding (high-intensity stimulation similar to what occurs in implosive therapy). Treatment followed, and consisted of the conditioning of an avoidance response. This was accomplished by placing the rats in a modified Mowrer-Miller box which was divided into two compartments with a barrier between. The rats were placed in one side of the box and subjected to an electrical shock at the same time a buzzer sounded. The rats could terminate the shock and sound by making the avoidance response of escaping to the other compartment by running through the open barrier. The electrical shock was the unconditioned stimulus (UCS) and the buzzer was the conditioned stimulus (CS). After ten days of treatment, the three groups of rats were conditioned to make manifest avoidance behavior in response to the CS (buzzer) alone.

Experimental extinction then followed for the next four days. The three groups of rats received different conditions for extinction. No electrical shock was presented at any time during the extinction procedure. The control group received four days of rest. The barrier group was confined in one side of the treatment box and prevented from making avoidance responses to the other side of the box by the lowering of a barrier. This group was presented with 20 five-second presentations of the buzzer (CS) per day for four days. The flooding group received 100 seconds of continuous presentation of the buzzer (CS) daily, presumably eliciting a high level of anxiety, and were free to make the avoidance response of going to the other side of the box. The avoidance response did not, however, terminate the CS presentation.

Following the different experimental extinction procedures, the three groups received thirteen days of identical extinction in which the animals were allowed to escape from the CS by running to the other side of the treatment box. The results of this extinction showed that the flooding group had the best extinction results of the three groups. The results were statistically significant.

Following the thirteen days of identical extinction, all of the rats were again given two days of reconditioning. Immediately following these two days of reconditioning, the three groups again received ten days of identical extinction. The results obtained were highly significant. The barrier group experienced a persistent resistance to extinction. The flooding group achieved the best extinction results when compared to the barrier and control groups.

The crucial point in this study was that the flooding subjects, who were subjected to high intensity stimulation similar to what occurs in implosive therapy, were able to make the avoidance response; yet this avoidance response did not terminate the CS (buzzer) presentation. The CS was presented for the entire 100 seconds. Polin (15) concluded that the superior extinction rate of the flooding group was due to this massing of the instrumental avoidance response without the cessation of the CS (buzzer).

Sherman (17) studied the effect on extinction of varying confinement conditions and the length of the CS presentation while holding total exposure to the CS constant. Five groups of ten Sprague-Dawley rats were taught a two-way avoidance response in a shuttlebox in relation

to shock (UCS) and a buzzer (CS). One group of rats served as the controls, and rested. During the treatment of the experimental groups, one-half of the four groups of rats were confined in one side of the apparatus and the other one-half of the four groups were not confined. In addition, one-half of each of the above groups received a long presentation of the CS while the other half received CS presentations of short duration.

Nine days of regular extinction followed. After the first day, virtually all of the subjects in the experimental groups were equally extinguished. The control group showed little extinction. The feature that the experimental subjects had in common was that the CS termination was not response-contingent. In other words, the subjects had no control over the CS termination. In generalizing the results of this study to humans, Sherman (17) stated:

If one wishes to eliminate an avoidance response, one should not allow subjects to terminate the CS by making the response. The present study with infrahuman organisms suggests that it does not matter whether subject is confined (restrained by physical or psychological means) and exposed to the CS or whether he is free to make the avoidance response so long as it is ineffective in terminating the CS (p. 237).

In reference to desensitization and implosive therapy, Sherman (17) stated:

The present study might be construed as providing a rough analogue of both of the principle behavior therapy treatments for phobias and support for their equal efficacy. Stampfl exposes the patient to a few long, stressful contacts with the CS while Wolpe presents the CS in many small doses, and both claim striking success. Perhaps the form of the CS presentation is unimportant and the only things that really matter are the total amount of CS presentation and that this presentation is under the therapist's (not the patient's) control (p. 237).

Wolpin and Raines (27) studied visual imagery, expected roles, and extinction as possible factors in reducing fear and avoidance behavior in human subjects. Six subjects who had an intense fear of snakes were treated by different experimental procedures. Two subjects were instructed to deliberately tense their muscles while visualizing items from the fear hierarchy. Two subjects were instructed to visualize items from the fear hierarchy, with no instructions for relaxation or muscle tensing. Two subjects, who were given no particular instructions for relaxation or muscle tensing, visualized high anxiety-evoking items from the top of the standardized fear hierarchy. Results indicated that all six subjects experienced a decrease in their fear of rats. This study is consistent with Stampfl's implosive therapy.

Malleson (12) treated a case of severe examination panic by the method of reactive inhibition, a technique very similar to implosive therapy. He stated that he had used this method successfully in the treatment of a number of cases of acute examination anxiety. The subject in his report was an Asian student who had failed a very important examination due to his acute anxiety associated with taking the test. Treatment began just forty-eight hours prior to the subject's retaking his examination. The rationale for the therapeutic technique was explained to the subject. He was then instructed to experience the anxiety that he associated with his examination. He was asked to tell of unpleasant consequences that he felt would follow his failure. These were such events as ridicule from his friends, the disappointment of his family, and financial loss. He was instructed to visualize

these unpleasant results and to experience as much anxiety as he could. Initially, he became more upset as he followed the instructions. But as the session continued, he soon became less upset. By the end of the half hour it was difficult for him to experience anxiety, and he gradually became calm. This procedure was repeated twice a day during the remaining two days before the examination. In between these treatment sessions, he was again instructed to visualize anxiety-evoking scenes associated with the examination and to experience as much anxiety as he could. By the time of the examination, the subject was almost totally unable to experience anxiety associated with it. He subsequently passed his examination with no difficulty.

The success reported by Malleon (12) indicated that implosive therapy-like techniques could be successfully applied in treating test anxiety. The brevity of his treatment, three sessions, suggests that implosive therapy techniques require less time than desensitization in reducing test anxiety.

Kirchner and Hogan (10) conducted a study on implosive therapy which studied the effect of reducing the therapist variable in the implosion of phobias. To obtain this goal, thirty-five subjects who had a phobic fear of rats were divided into a control and an implosive therapy group. All subjects met in a language laboratory room equipped with individual booths. The control group met first, followed by the implosive therapy group. All treatment was carried out in one session. Instructions were recorded on tape and presented to the subjects. Both groups received the same initial instructions.

The control group then received instructions to relax and imagine pleasant scenes while listening to music. The implosive group received instructions designed to elicit high anxiety through the presentation of cues associated with their fear of rats. All members of the implosive group listened to the same tape and received the same directions, which consisted of instructions to visualize anxiety-evoking scenes in regard to their rat phobia.

At the end of the study, all subjects were presented with an opportunity to handle a live rat. Results indicated that five of the nineteen control subjects, or about 26 per cent, picked up the rat during the post-test procedure. Ten of the sixteen implosive therapy group members, or about 62 per cent, were successful in picking up the live rat.

Although Kirchner and Hogan's study (10) was not designed to test the effectiveness of group implosive therapy, it did indicate that a group of subjects could be imploded at the same time. Group interaction was limited in that it was not possible for the subjects to see each other. This study did indicate, however, that standard stimuli could be presented to subjects undergoing implosive therapy without the need for individualizing each item. In addition, the elicitation of anxiety in the group implosive therapy method was found to be similar to that found in individual implosive therapy. In regard to this point, Hogan and Kirchner (10) stated:

Throughout the tape the subjects were observed making bodily movements and facial grimaces which are typical responses witnessed in individuals who have been individually imploded (p. 103).



This study, therefore, lends support to the feasibility of applying implosive therapy in group settings.

Smith and Sharpe (18) conducted a study that was designed to determine the effectiveness of using implosive therapy in treating a severe case of school phobia of long duration. The subject was a thirteen-year-old-boy who displayed all the symptoms of a school phobia. He had anxiety, loss of appetite, chest pains, and so forth, all of which were associated with school. Therapy began with the development of a fear hierarchy in which scenes evoking high anxiety associated with school were ranked in order of their ability to evoke anxiety. The subject was instructed to visualize the scenes and to experience as much anxiety as possible. Improvements in the subject's behavior were evident following the first session. Treatment continued along with his gradual return to school. By the fifth and sixth implosive therapy session, the subject was not reporting any anxiety in school and treatment was terminated. A thirteen-week follow-up showed that no relapse occurred in the subject.

In discussing the results of their study, Smith and Sharpe (18) came up with several implications. They stated that it is rather surprising that implosive therapy, in view of its demonstrated effectiveness in reducing anxiety, has not been used to a greater extent in the treatment of anxiety-based disorders in children. They suggest a more systematic evaluation of the efficacy of implosive therapy in the treatment of school phobias and other anxiety-based disorders in children.

### Desensitization versus Implosive Therapy

Barrett (2) did a comparison of desensitization and implosive therapy in the treatment of snake-phobic subjects. This article is cited in detail because of its importance to the present research. Barrett began his comparison of implosive therapy and desensitization by stating:

A practitioner's choice of either SDT [desensitization] or IT [implosive therapy] on theoretical grounds would be premature since both therapies must await future demonstration of the adequacy of their underlying theories. Choice on the basis of effectiveness also would be difficult since both SDT and IT, when studied under well controlled conditions have been shown to be effective (2, p. 587).

Barrett's study was conducted to provide a direct comparison of the effectiveness of desensitization and implosive therapy and to compare the efficiency of the two methods. Efficiency was determined by the amount of time necessary to reduce the phobic anxiety. In the study thirty-six subjects, eight males and twenty-eight females, were selected and randomly assigned to one of three groups: (1) desensitization, (2) implosive therapy, and (3) controls. The desensitization subjects received four training sessions and up to eleven desensitization sessions. The rationale and relaxation training were given in the first four sessions, with desensitization being presented in the remainder of the sessions. The implosive therapy subjects received a similar rationale to that presented to the desensitization group. Implosive therapy followed and consisted of having the subjects imagine a scene that evoked high anxiety. The subjects were instructed to concentrate on experiencing as much anxiety as they could until they could not

sustain anxiety. The control subjects were merely instructed to return for the follow-up test.

The results indicated that both desensitization and implosive therapy were equally effective in reducing the snake-phobic behavior. A significant difference was found in the length of time required for reducing the fear. Implosive therapy was completed in 45 per cent of the time required by desensitization. Implosive therapy was thus found to be the more efficient method.

DeMoor (5) compared desensitization and flooding (a technique similar to that of implosive therapy) in treating snake-phobic subjects. He divided twenty-seven snake-phobic subjects into the following three matched groups: (1) control, (2) desensitization, and (3) flooding. Desensitization consisted of five sessions in which the subject was relaxed and instructed to imagine scenes from a fear hierarchy. In the first session, the first five minutes were devoted to explaining the rationale and the next five minutes to construction of the individual fear hierarchy. The remaining twenty minutes of the first session, and the following four twenty-minute sessions, were devoted to desensitization.

In the first session, the flooding subjects received a five-minute explanation of the rationale of flooding, followed by twenty minutes' training in maintaining and enhancing a high state of anxiety. The next four twenty-minute sessions were spent in having the subjects experience the stimulus-elicited anxiety as intensely as they possibly could. Results indicated that the experimental groups equally improved significantly, when compared to the control group.

Calef and MacLean (4) studied the efficiency of group desensitization and group-reactive inhibition (a method very similar to implosive therapy) in the treatment of anxiety associated with public speaking. The subjects were college students and were divided into groups of ten each in the following manner: (1) group desensitization, (2) group-reactive inhibition, and (3) control group. The desensitization group received the usual desensitization procedure. The group-reactive inhibition subjects received treatment which emphasized the presentation of anxiety-evoking items from a central fear hierarchy related to public speaking. During the presentation of the anxiety-evoking stimuli, the subjects were instructed to concentrate on sensations which accompanied their anxiety. Pre- and post-treatment measures indicated that both treatment methods were equally successful. In view of their findings, Calef and MacLean (4) suggested that reactive inhibition may be a more efficient method than desensitization, since it is a simpler procedure. Their study also indicated that implosive therapy techniques could be successfully applied in a group setting.

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## CHAPTER III

### PROCEDURES AND DESCRIPTION OF THE INSTRUMENT

#### Source and Selection of Subjects

The population from which the subjects were drawn consisted of all students between the ages of seventeen and twenty-two who were enrolled in Introductory Psychology classes at North Texas State University during the fall 1971 semester. A notice was read by the teacher in each of the classes asking for volunteers who felt that they had anxiety associated with taking tests and who would be willing to participate in what was called a three-week study on test anxiety. A total of 278 students volunteered to participate in the study.

The TAQ was administered to all subjects. Normative data from a previous study (3) in which the TAQ was administered to 704 undergraduate psychology students at North Texas State University was utilized. The cut-off point score on the TAQ for subjects to be included in the present study was defined as a score at or above the upper thirty-eighth of the distribution obtained on the previous norm data, a score of 212. The questionnaires were hand-scored by the therapist with the use of a plastic overlay. Eighty-one subjects met the criteria for inclusion in the present study. These eighty-one subjects were assigned numbers from 1 to 81. From this subject pool, thirty-six subjects were randomly selected through the use of a table of random numbers.



to participate in the study. These subjects were then randomly assigned to one of the following groups through the use of the table of random numbers: (1) implosive therapy, (2) placebo-attention, and (3) no-treatment control. Following this random assignment, an analysis of variance was completed on the pre-test scores. This analysis indicated that the three groups did not differ statistically in terms of their pre-treatment TAQ scores.

#### Treatment Conditions

All treatment in the three groups was conducted by the same therapist. This was designed to control for any variables that might have intervened as a result of having different therapists for each group. In addition, all instructions were verbally presented. Interaction among subjects was also discouraged. The subjects were instructed not to discuss the treatment with each other at any time during the course of the study.

#### Implosive Therapy Group

The implosive therapy group consisted of five males and seven females, with an average age of 19.0 years. The group met with the therapist twice a week for two weeks and once a week for one week. The meetings were held on Monday and Thursday afternoons, and the duration of each session was thirty minutes. The meetings were held in a room selected to insure that outside disturbances would be minimal. The first ten minutes of the first session was devoted to the presentation of the rationale for implosive therapy (Appendix B).

At the completion of the rationale, all subjects were instructed to close their eyes. The remaining twenty minutes were spent in having the subjects visualize anxiety-evoking scenes from the test anxiety hierarchy (Appendix C) while concentrating on experiencing the anxiety that was elicited as strongly as possible. This procedure, with the exception of the introductory rationale, was continued during the remaining four sessions. The group members visualized scenes from the test anxiety hierarchy developed by the therapist on the basis of the subjects responses to the TAQ. This group test anxiety hierarchy consisted of ten scenes which the subjects indicated evoked anxiety associated with taking tests. The group was instructed to visualize and imagine items from the hierarchy and to concentrate on experiencing the anxiety elicited as intensely as possible. The signal that the subjects used to indicate that they were experiencing anxiety was the raising of the left index finger. Lowering of this finger indicated that they could no longer experience anxiety. When one scene could no longer sustain a high level of anxiety in all of the subjects, the next scene was presented. Detailed instructions pertaining to the visualization of the stimuli from the test anxiety hierarchy were presented by the therapist. These instructions were presented to assist the subjects in their visualizing the stimuli and experiencing the accompanying anxiety. These instructions are available in Appendix D. Two scenes were presented in each session. Scene One was entitled "Preparing to take an important individual intelligence test." The detailed instructions for this scene were as follows:

"This test is vitally important to you. A high score on it will enable you to obtain a good position that you desperately want. It is so important that it makes you intensely anxious as the time for the test approaches. Your family and all of your friends are aware of the importance of this test. You are anxious, very anxious, as you contemplate taking the test. You feel your muscles tighten up, a lump develops in your throat, and you become increasingly anxious as the time approaches. Concentrate on experiencing this anxiety! Experience it as intensely as you can! Think of all the frightening and sickening consequences that would follow if you did poorly."

Following the completion of five treatment sessions, an amount of time consistent with that normally reported in the application of implosive therapy, the post-treatment TAQ was administered. One month later, the follow-up TAQ was administered.

#### Placebo-Attention Group

The purpose of this group was to control for the non-specific therapeutic factors that accompany interaction between a therapist and his subject. An attempt was made to make this procedure as similar as possible to that used in the implosive therapy procedure without, of course, the elicitation of anxiety.

The group consisted of four males and eight females with an average age of 19.0 years. They met with the therapist for the same period of time and under similar conditions as the implosive therapy group.

During the first ten minutes of the first session, a rationale similar to that presented to the implosive therapy group was presented (Appendix E). Following the presentation of the rationale, the subjects were instructed to visualize items from the list of non-relevant items (Appendix F). Two items were presented in the first session, and two items were presented in each of the following four sessions. The subjects were instructed to close their eyes while visualizing the items. To aid the subjects in their visualization of the stimuli and to help them experience the accompanying sensations, detailed instructions were presented by the therapist (Appendix G). The first item was entitled "Admiring a beautiful painting." The detailed instructions presented to the subjects were as follows:

"You are walking through a famous museum and you suddenly come upon a beautiful painting that captures your attention and evokes memories familiar to you. As you stand there, you experience various sensations. You want to move on but you find yourself glued to the spot. I will now pause as you experience the various sensations associated with this scene."

Following the completion of the last session, the post-treatment TAQ was administered. The subjects were given the instrument on the same day as the implosive therapy group. One month later, the follow-up TAQ was administered.

#### Control Group

The control group consisted of six males and six females, with an average age of 19.5 years. Following their assignment to the control

group, the subjects were individually contacted by the therapist and informed that they would be seen again in three-weeks' time. No additional information was given to the control subjects. Following the completion of the treatment procedures in the implosive therapy and placebo-attention groups, the control group was given the post-treatment TAQ. One month later, the follow-up TAQ was administered.

#### Instrument

The instrument employed in this study was the College Form of the Test Anxiety Questionnaire (TAQ), developed by Mandler and Sarason (7). This instrument is a widely used instrument for the measurement of test anxiety. The TAQ consists of thirty-nine questions. Four of the questions are fillers and are not scored. The remaining thirty-five questions are scored on an interval scale ranging from one to ten. For clarification, an example is presented below:

36. Before taking a course examination, to what extent do you worry?

---

worry a lot                      midpoint                      worry not at all

The subject is instructed to place an X on the line at a point which he thinks most clearly indicates his feeling in regard to it. The point on the line at which the subject marks an X indicates the degree of anxiety that the particular item elicits. Possible total scores range from a low of 39 to a high of 350. These scores are obtained by summing all of the scores on the individual questions. The questionnaires were hand-scored by the therapist with the use of

a plastic overlay.

A test-retest reliability coefficient of .91 (N=70) and a split-half reliability coefficient of .91 (N=100) are reported by Mandler and Cowen (6). Albert and Haber (1) reported a correlation of .64 between the TAQ and the Debilitating Achievement Anxiety Scale. Raphelson (8) reported a correlation of .59 between the TAQ and the Manifest Anxiety Scale. Endler, Hunt, and Rosenstein (2) reported a correlation of .66 between the TAQ and the S-R Inventory of Anxiousness.

#### Procedures for Analyzing the Data

The statistical procedure consisted of the random assignment of the subjects into three groups. An analysis of variance (10) was then carried out on the pre-test TAQ scores to determine if there were any significant differences in the pre-test means of the three groups. The results indicated that there were no significant differences. An analysis of variance procedure was computed on the post-treatment and one month follow-up TAQ scores of the three groups. The Duncan multiple range test (4) was utilized to make specific contrasts between group mean change scores. Within each group, implosive therapy, placebo-attention, and no-treatment control, a t test (5) was used to evaluate the significance of the differences obtained on the post-treatment and follow-up TAQ scores.

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## CHAPTER IV

### RESULTS AND DISCUSSION

#### Results

The statistical procedure consisted of the random assignment of the subjects into three groups on the basis of their pre-test TAQ scores. Table I lists the means and the standard deviations of the three groups on the pre-test TAQ scores.

TABLE I  
PRE-TEST TAQ MEANS AND STANDARD DEVIATIONS

Group	N	<u>TAQ</u> Mean	Standard Deviation
Implosive Therapy	12	242.42	13.61
Placebo-Attention	12	240.00	21.99
Control	12	242.00	20.07

The analysis of variance (10) was then run on the pre-test TAQ scores of the three groups to determine if there were any significant differences in the pre-test means of the three groups. The analysis of the data indicated that the groups did not differ statistically in terms of their pre-treatment TAQ scores. The information pertaining to the results of the analysis of variance on the pre-test scores is included in Table II.



TABLE II

SUMMARY OF ANALYSIS OF VARIANCE OF TEST ANXIETY SCORES  
ON PRE-TEST TAQ

Source	SS	df	MS	F	P
Between Groups	40.06	2.	20.03	0.06	0.94
Within Groups	11792.92	33.	347.36		
Total	11832.97	35.			

The results of the post-test TAQ scores are presented in Table III. The obtained  $F$  ratio of 3.6809 indicated that there were significant differences among the three groups in test anxiety reduction, at the .05 level of significance.

TABLE III

SUMMARY OF ANALYSIS OF VARIANCE OF TEST ANXIETY SCORES ON  
POST-TEST TAQ

Source	SS	df	MS	F	P
Between Groups	7691.06	2.	3845.53	3.68	0.03
Within Groups	34475.50	33.	1044.71		
Total	42166.56	35.			

The Duncan multiple range test (1) was used to determine which group TAQ means differed significantly. The results of this procedure for post-treatment TAQ are presented in Table IV. As indicated in

Table IV, there was a significant difference between the implosive therapy group and the control group. There was not, however, a significant difference obtained at the .05 level between the implosive therapy and placebo-attention groups. The difference between implosive therapy and placebo-attention groups was, however, in the expected direction.

TABLE IV  
DUNCAN MULTIPLE RANGE TEST COMPARISONS OF GROUP  
TAQ REDUCTION SCORES  
POST-TEST

Comparison	Difference Required for Significance at .05 level	Difference
Implosive vs. Control	28.32*	35.42
Control vs. Placebo	26.95	13.17
Placebo vs. Implosive	26.95	22.25

\*Significant at the .05 level

The Duncan multiple range test was also used to determine which group TAQ means differed on the follow-up TAQ. As indicated in Table V, there is a significant difference between the implosive therapy group and the control group. There is no significant difference between the implosive therapy group and the placebo-attention group at the .05 level.

TABLE V  
DUNCAN MULTIPLE RANGE TEST COMPARISONS OF GROUP  
TAQ REDUCTION SCORES  
FOLLOW-UP

Comparison	Difference Required for Significance at .05 level	Difference
Control vs. Implosive	29.54*	36.00
Control vs. Placebo	28.11	18.25
Placebo vs. Implosive	28.11	17.75

\*Significant at the .05 level

The decreases within each group on TAQ scores were determined by use of the t test for correlated means (2). These results are presented in Tables VI and VII. A highly significant difference (P=.0021) was obtained for the implosive therapy group for within-group mean changes between the pre- and post-TAQ scores. The placebo-attention and control groups failed to show a significant change.

TABLE VI  
WITHIN-GROUP CHANGES ON TAQ SCORES  
BETWEEN PRE- AND POST-TEST

Group	Pre-Treatment Mean	Post-Treatment Mean	Change	<u>t</u>	P
Implosive	242.42	209.17	33.25	4.07	0.002
Placebo	240.00	231.42	8.58	1.19	0.259
Control	242.00	244.58	-2.58	-0.41	0.694

Table VII indicates that the follow-up test scores in the three groups remained rather stable, with the implosive therapy group showing a -2.58, the placebo attention a 1.92, and control a -3.17 change.

TABLE VII  
WITHIN-GROUP CHANGES ON TAQ SCORES BETWEEN  
POST-TEST AND FOLLOW-UP TAQ

Group	Post-Treatment Mean	Follow-up Treatment Mean	Change	<u>t</u>	P
Implosive	209.17	211.75	-2.58	-0.73	0.51
Placebo	231.42	229.50	1.92	0.44	0.67
Control	244.58	247.75	-3.17	-0.90	0.61

Results of the individual score changes on the pre-, post-, and follow-up administrations of the TAQ for the implosive therapy group are presented in Table VIII.

TABLE VIII  
IMPLOSIVE THERAPY GROUP TAQ SCORES

SUBJECTS Sex Age	Pre- test	Post- test	Pre- vs. Post- Difference	Follow-up	Post- vs. Follow-up Difference	Pre- vs. Follow-up Difference
F 19	219	195	-24	192	-3	-27
M 18	230	208	-22	227	+9	-3
F 20	233	209	-24	222	+13	-11
F 19	234	216	-18	200	-16	-34
M 18	238	149	-89	131	-18	-107
F 19	240	220	-20	221	+1	-19
M 20	242	225	-17	225	0	-17
F 19	242	207	-35	217	+10	-25
M 19	251	249	-2	239	-10	-12
M 20	255	238	-17	250	+12	-5
F 18	255	163	-92	171	+8	-84
F 19	270	231	-39	246	+15	-24

The group consisted of seven females and five males. Reductions on the TAQ were obtained by all subjects on the post-test administration. The males decreased by an average of 29 points and the females decreased by an average of 36 points. No subjects increased their scores on the post-TAQ administration. On the follow-up administration, two males and five females increased their TAQ scores over those obtained on the post-test administration. However, these score increases were very slight, averaging 9.4 points for the seven subjects. None of the scores increased to the pre-treatment TAQ level. Four of the subjects decreased their scores on the follow-up administration of the TAQ as compared to the post-test administration.

Table IX lists the results of the placebo-attention group. There were eight females and four males in this group.

TABLE IX  
PLACEBO-ATTENTION GROUP TAQ SCORES

SUBJECTS		Pre- test	Post- test	Pre- vs. Post- Difference	Follow-up	Post- vs. Follow-up Difference	Pre- vs. Follow-up Difference
Sex	Age						
F	19	212	187	-25	204	+17	-8
F	18	219	171	-48	180	+9	-39
M	18	221	202	-19	194	-8	-27
M	18	223	261	+38	259	-2	+36
F	20	231	233	+2	230	-3	-1
F	19	232	214	-18	203	-11	-29
M	19	234	235	+1	201	-34	-33
F	20	240	242	+2	237	-5	-3
M	19	253	248	-5	266	+18	+13
F	18	264	214	-50	231	+17	-33
F	20	275	283	+8	273	-10	-2
F	20	276	287	+11	276	-11	0

On the post-treatment TAQ administration, four females and two males decreased their scores from the previous administration. The female subjects decreased their scores by an average of 35.2 points, and the male subjects decreased their scores by an average of 12 points. Six subjects increased their TAQ scores on the post-test administration. The four female subjects increased by an average of 5.7 points while the two male subjects increased their scores by an average of 19.5 points. Eight subjects obtained a further decrease on the follow-up administration of the TAQ. Of these eight subjects, six decreased their scores below their pre-treatment TAQ scores. On the follow-up administration, three females and one male increased their TAQ scores over those obtained on the post-test administration. Only two of these subjects, however, obtained a score increase that exceeded their pre-treatment TAQ scores.

Results of the no-treatment control group scores on the TAQ are listed in Table X. This group consisted of six females and six male subjects. The average age of the group was 19.5 years. On the post-treatment administration of the TAQ, two female subjects and four male subjects increased their TAQ scores. The female subjects increased their scores by an average of 13 points and the males by an average of 24.2 points. On the follow-up administration of the TAQ, four female subjects and four male subjects increased their scores over those obtained on the post-administration. Seven of the subjects obtained an increase in their scores on the follow-up administration of the TAQ that exceeded their pre-treatment TAQ scores.

The two female subjects increased their scores by an average of 16 points, and the five male subjects increased their scores by an average of 23.6 points.

TABLE X  
NO-TREATMENT CONTROL GROUP TAQ SCORES

SUBJECTS Sex Age	Pre- Test	Post- Test	Pre-Vs. Post- Difference	Follow-up	Post-Vs. Follow-up Difference	Pre-Vs. Follow-up Difference
F 20	212	202	-10	210	+8	-2
M 19	215	198	-17	213	+15	-2
M 20	221	226	+5	227	+1	+6
M 20	229	258	+29	255	-3	+26
F 18	230	245	+15	240	-5	+10
F 19	240	251	+11	262	+11	+22
F 20	250	239	-11	244	+5	-6
F 19	258	237	-21	240	+3	-18
M 19	258	256	-2	280	+24	+22
F 21	260	229	-31	207	-22	-53
M 18	261	280	+19	270	-10	+9
M 21	270	314	+44	325	+11	+55

#### Evaluation of the Hypotheses

Hypothesis number one stated that subjects participating in group implosive therapy would show a significant mean decrease on the score obtained on the post-TAQ when compared to the placebo-attention group and the no-treatment control group. The results of the analysis of variance and the Duncan multiple range test failed to support this hypothesis. There was a significant difference between the implosive therapy group and the no-treatment control group; however, no significant difference was found between the implosive therapy group and

the placebo-attention group.

Hypothesis number two stated that there would be no significant difference between the placebo-attention group and the no-treatment control group on the post-TAQ. This hypothesis was supported by the results of the Duncan multiple range test.

Hypothesis number three stated that there would be no significant difference in the group implosive therapy mean scores on the TAQ obtained on the post-treatment administration and those obtained on a one month follow-up administration. The analysis of the t test supported this hypothesis.

Hypothesis number four stated that there would be no significant difference between the placebo-attention control group and the no-treatment control group mean scores obtained on the post-treatment and one month follow-up administrations of the TAQ. The analysis of the t test supported this hypothesis.

#### Discussion

Although not all of the hypotheses were supported, there were sufficient indications to support the conclusion that implosive therapy is a useful technique in the treatment of test anxiety. There are a number of factors that supported this conclusion. The mean decrease of 33.25 points in the implosive therapy group between the pre- and post-TAQ administrations gives a t value of 4.07, which is highly significant ( $P=.002$ ). The pre- and post-TAQ mean difference in the attention-placebo group was 8.58 points, which gives a t of 1.18,



which is not significant ( $P=0.25$ ). The mean difference in the no-treatment control group's pre- and post-TAQ administrations was  $-2.58$ , which also does not reach significance ( $P=.69$ ).

The Duncan multiple range test on the post-administrations of the TAQ indicated a mean difference of  $34.41$  between the scores of the implosive therapy and the no-treatment control groups. This difference is significant at the  $.05$  level. The placebo-attention group differed from the implosive therapy group by a mean difference of  $22.25$ . Although this difference is not statistically significant, it was in the expected direction. The difference between the placebo-attention and the no-treatment control groups showed a mean difference of  $13.17$ , which is not statistically significant.

Observation of the follow-up Duncan multiple range test indicated that the mean differences between the groups remained relatively the same. The implosive therapy and no-treatment control group difference remained significant at the  $.05$  level.

The statistical analysis indicated that implosive therapy was significantly better than no treatment at all. There was only one hypothesis that was not fully supported. This was the hypothesis that stated that there would be a significant difference between the implosive therapy group and both the placebo-attention and no-treatment control groups. As noted, this hypothesis was only partially supported, in that a significant difference was found between the implosive therapy group and the no-treatment controls, but not between the implosive therapy and the placebo-attention groups.

In regard to the results, there are several additional factors that warrant consideration. One factor concerns the dates on which the post-TAQ and follow-up TAQ administrations were given. The pre-treatment TAQ was administered during the first eight weeks of the fall semester. Treatment occurred during the ninth through eleventh weeks, with the post-TAQ being administered at the completion of treatment. The follow-up TAQ was given four weeks later, approximately one week before the final examination period. Therefore, when the post- and follow-up TAQ administrations were given, the subjects were approaching final examinations. The time immediately prior to the final examination week would presumably be a very anxiety-evoking period. A previous study on test anxiety (3), which used subjects from the same source as the present study, showed a decrease in the no-treatment control TAQ scores of fifteen points. In the present study, the no-treatment control group mean increased from 242 on the pre-test, to 244 on the post-test, and to 247 on the follow-up test. Since the purpose of the control group was to determine what changes would occur in the TAQ scores without treatment and the placebo-attention effect, the increased mean score obtained by the control group is most probably a reflection of the anxiety elicited as the final examination period approached. The fact that the implosive therapy group achieved a significant mean decrease takes on an added significance in view of the presumed additional anxiety all subjects experienced as the final examination period approached.

In Chapter Two, the factors necessary for successful implosive therapy were discussed. It was mentioned that two factors are necessary: (1) the ability to visualize the anxiety-evoking stimuli

and (2) the experiencing of the associated anxiety at a high level. The failure of the implosive therapy group to obtain a significant difference from the placebo-attention group raises the question of whether one or both of the above conditions were sufficiently satisfied in the implosive therapy group.

It is very difficult to determine when a subject is adequately visualizing the stimuli being presented by the therapist. It is also equally difficult to determine if a subject is experiencing anxiety associated with the stimuli being visualized. In this study, the implosive therapy group subjects were presented with detailed verbal descriptions of the stimuli (Appendix D). The stimuli consisted of scenes drawn from a ten-item fear hierarchy on test anxiety (Appendix C). The signal for the subjects to inform the therapist that they were experiencing anxiety was the raising of the left index finger. It was anticipated that these procedures would be sufficient to fulfill the requirements necessary for successful implosive therapy.

During the first session of treatment in the implosive therapy group, there were good indications that all the subjects were adequately visualizing the stimuli being presented, and experiencing anxiety. The therapist stood in front of the room, and this enabled him to closely observe and follow the reactions and facial expressions of all members. Within several minutes from the beginning of treatment, all members were signaling that they were experiencing anxiety, by raising their left index fingers. The reporting of anxiety by the subjects was corroborated by observable reactions such as the grimacing of their facial muscles and the twisting in their chairs. This state of anxiety was

maintained for approximately five minutes before the group began to lower their fingers. A five-minute pause followed. At the end of the pause, additional stimuli were presented for approximately two minutes. This, in turn, was followed by a five-minute period in which the subjects concentrated on experiencing the anxiety associated with the stimuli. A five-minute pause followed, and the treatment session was terminated shortly thereafter. At the end of the treatment session, several subjects approached the therapist and informed him that they felt intense anxiety when the stimuli were presented.

In the second treatment session, there were continued indications that the subjects were adequately visualizing the stimuli and intensely experiencing the associated anxiety. The therapist observed that the subjects were grimacing and twisting as they had in the first session. In the third session, there was a noticeable decrease in the number of subjects who signaled that they were anxious. In addition, those who did signal that they were anxious did so for a shorter period of time than in the two preceding sessions. The reduction in the reporting and maintaining of anxiety continued in the fourth and fifth sessions. By the fifth session, there were only one or two subjects who were indicating that they experienced anxiety, and these subjects only briefly raised their fingers.

At this point, a question is raised concerning the reduction in the reporting of anxiety in the third, fourth, and fifth sessions. Was this reduction in reported anxiety the result of the previous implosive therapy of the first two sessions having generalized to the other items

on the fear hierarchy; or was it indicative of, for whatever reason, a decreased ability in the subjects to adequately visualize the stimuli being presented or to experience the anxiety associated with it? This is a very important factor in the present study. Difficulty in adequately answering this question is viewed as one of the major weaknesses of the present study.

The therapist presented the stimuli in an effort to induce anxiety in the subjects during the implosive therapy treatment. This procedure proved effective in the first few sessions, but of indeterminable effectiveness in the following sessions.

An additional factor in the failure of the implosive therapy group to obtain a significant difference from the placebo-attention group might have been that the items on the fear hierarchy were not sufficiently different and distinct from each other. The items may have been similar enough to permit extinction to occur in the first few sessions when the first four items from the fear hierarchy were presented. If the items in the fear hierarchy were too similar, extinction would be expected to generalize to the entire hierarchy and result in a decreased efficiency of the implosive therapy. This must also be a factor in considering the results of the present study.

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## CHAPTER V

### SUMMARY, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

#### Summary

In recent years, there has been a growing interest in treating unadaptive anxiety by behavioristic methods. Two behavioristic methods that have generated a large amount of research in this area are desensitization (11) and implosive therapy (8).

Implosive therapy is a behavioristic technique developed by Stampfl in 1967 (8). His technique differs from desensitization in several respects. Basically, desensitization is counterconditioning, a procedure in which a new conditioned response (CR) that is incompatible with the (CR) to be eliminated, is conditioned to the conditioned stimulus. Implosive therapy is based on the principle of extinction. If the (CS) is presented over and over again without any further pairing of the unconditioned stimulus (UCS), the conditioned response (CR) will begin to decrease and eventually will cease to occur at all. The basic fundamental of Stampfl's principle of implosive therapy has been succinctly stated by Wenrich (10) as

If a conditioned stimulus is presented without an accompanying unconditioned stimulus [or, as Stampfl and Levis call it, an accompanying primary reinforcement], an intense emotional reaction will be generated; and with repeated presentations of these anxiety-eliciting stimuli, the reaction will subside and cease altogether (p. 17).

Desensitization has been widely used in treating problems in which unadaptive anxiety is a factor (10, 11). Desensitization has also been found to be particularly effective in reducing test anxiety (3, 5, 9). Desensitization and implosive therapy have similar origins in that both are based on the empirical psychology of learning. They have been compared by Calef and MacLean (2), Barrett (1), and DeMoor (4) who have noted that both are effective in reducing anxiety. At the time of this study, no studies had been done in which implosive therapy was used in a group setting in the treatment of test anxiety. Available research indicated that implosive therapy is a considerably shorter and more efficient method than desensitization. Therefore, the major purpose of this study was to determine if group implosive therapy could be successfully applied in treating test anxiety.

Thirty-six undergraduate students enrolled in introductory psychology courses served as subjects. The instrument used was the Test Anxiety Questionnaire (TAQ), developed by Mandler and Sarason (7). On the basis of their TAQ scores, twelve subjects were randomly assigned to each of the following groups: (1) implosive therapy, (2) placebo-attention, and (3) no-treatment controls. The implosive therapy consisted of having the twelve subjects imagine anxiety-evoking items drawn from a fear hierarchy (Appendix C) on test anxiety and concentrate on experiencing the associated anxiety as intensely as possible. Following treatment, the post-treatment TAQ was administered. One month later, the follow-up TAQ was administered.



The placebo-attention group was seen under the same conditions as the implosive therapy group. Instead of implosive therapy, they received instructions to imagine non-relevant stimuli and to concentrate on the sensations evoked. The therapist presented scenes from a ten-item list of non-relevant stimuli (Appendix F) over a three-week period. Two scenes were presented during each session. At the end of the fifth session, and at approximately the same time as the implosive therapy group, the placebo-attention group was given the post-treatment TAQ. Four weeks later, the group received the follow-up TAQ.

The no-treatment controls were administered the pre-TAQ and then asked to return in three weeks, at which time the post-treatment TAQ was administered. Four weeks later, the follow-up TAQ was administered. All three groups received the post and follow-up TAQ administrations at approximately the same time.

The analysis of the results failed to support the major hypothesis that there would be a significant difference on the post-treatment TAQ between the implosive therapy group and both the placebo-attention and the no-treatment control groups. Three additional hypotheses were, however, supported. Hypothesis number two stated that there would be no significant difference between the placebo-attention and the no-treatment control group means as measured by the post-treatment TAQ. Hypothesis number three stated that there would be no significant difference in the group implosive therapy mean TAQ score obtained on the post-administration with that obtained on the follow-up administration.

Hypothesis number four which stated that there would be no significant difference in the placebo-attention group mean and the no-treatment control group mean on the TAQ obtained on the post-treatment administration and that obtained on a one-month follow up.

Although the major hypothesis was not fully supported, there were indications that implosive therapy is a useful technique in treating test anxiety. Analysis of the Duncan multiple range test (6) indicated that there was a significant difference at the .05 level between the implosive therapy group and the no-treatment control group. There was no significant difference found between the placebo-attention group and the implosive therapy group. The difference obtained was, however, in the expected direction. Either a minor decrease in the implosive therapy group or a minor increase in the placebo-attention group post-treatment TAQ scores would have produced a difference at the .05 level of significance. The implosive therapy within-group mean change produced a t value of 4.07, which is highly significant ( $P=.0021$ ). The within-group mean change of the placebo-attention and no-treatment control groups failed to reach significance ( $P=.25$  and  $P=.69$  respectively).

For implosive therapy to be successful, there must be an adequate visualization of the stimuli presented, along with the experiencing of the elicited anxiety at a high level. In the early implosive therapy treatment sessions, all subjects appeared to adequately fulfill both of these conditions. In the later sessions, there appeared to be a decrease on these two factors. In regard to these points,

the following questions are raised:

Was this reduction in the reporting of anxiety in the latter sessions the result of the effects of implosive therapy having generalized to all of the items on the fear hierarchy; in effect, were the items too similar, or was it indicative of, for whatever reason, a decreased ability in the subjects to adequately visualize the stimuli presented or to experience the associated anxiety.

Difficulty in adequately answering these questions must be viewed as one of the major weaknesses of the present study.

#### Conclusions

Several methodological weaknesses may have existed in the present study which prevented the four hypotheses from being fully supported. Consequently, these possible weaknesses limit the validity of the results derived from the study. In view of these factors, the following conclusions are offered:

1. Group implosive therapy is a useful technique in the treatment of test anxiety when compared to no treatment at all.
2. Group implosive therapy is not significantly better when the effects of placebo-attention are considered.
3. Group implosive therapy is particularly effective for some subjects but not for others. Difficulty in visualizing the stimuli or experiencing the associated anxiety may account for this difference among subjects.

4. The results of group implosive therapy remain stable over a four-week period.

5. The length of treatment time for group implosive therapy is significantly briefer than the length of time necessary for the related behavioristic technique of group desensitization.

6. The procedural difficulties present in applying implosive therapy in a group setting may result in an attenuation of its effectiveness.

7. The mere passage of time does not result in a reduction of test anxiety as measured by the control group's stable scores.

8. Implosive therapy is less harmful in terms of test anxiety reduction than are the effects of placebo-attention and no-treatment.

#### Implications

The implications derived from the present study should lead to the development of more effective and efficient procedures for the treatment of test anxiety. Implosive therapy offers promise of being a useful method for the reduction of test anxiety. However, it may be discovered by further research that not all subjects who have test anxiety can be successfully treated by implosive therapy. In the present study, no subject became more anxious as measured by the post- and follow-up TAQ administrations; however, several subjects did not show a significant decrease in anxiety. Screening interviews might possibly be a helpful procedure in determining which subjects could benefit from group implosive therapy and which subjects could

not. Individual differences must be taken into consideration in the choice of any therapeutic technique. There are individuals who would probably not be able to experience anxiety while in a group setting, yet who would be able to experience anxiety in an individual setting. Yet other students, who tend to escape or avoid anxiety-evoking stimuli, might benefit more from group or individual desensitization to lessen their anxiety.

An additional major implication of the present study is that more research is needed concerning the application of implosive therapy in a group setting. Additional research may provide information which the psychologist or counselor may consult in determining effective and efficient procedures for reducing test anxiety, or for reducing anxiety in any related problem. The implication for counselor and psychologist educators is that students should receive sufficient training and experience in the use of behavioristic methods to enable them to employ them effectively.

#### Recommendations

In view of the results of the present study, the following recommendations are offered:

1. Replication of the present study with a methodological design to provide a more effective control of the variability of the ability of different subjects to visualize the stimuli presented and to experience the associated anxiety.
2. Replication of this study to determine the distinctiveness of items comprising the fear hierarchy in group implosive therapy.

3. Additional research to determine what factors are present that may account for some subjects experiencing an anxiety reduction in group implosive therapy while others do not.

4. Research into determining the optimal size of a group for the use of implosive therapy.

5. Possible inclusion of psychophysiological measuring devices to permit the monitoring of the autonomic nervous system while group implosive therapy is being administered. This would serve as an adjunct to the reporting of anxiety of the subject. Measurement of the Galvanic Skin Response, pulse, and respiration would be one area that would be helpful in detecting anxiety.

6. Consideration of carrying out in-vitro or in-vivo group implosive therapy. A group of subjects could be presented with slides, films, or video tapes of the phobic object or anxiety-evoking situation to permit in-vitro implosive therapy. Presenting the actual feared object or situation to the subjects would permit in-vivo group implosive therapy.

7. Development of a completely automated group procedure in which implosive therapy could be applied to a group of subjects without the necessity of the therapist being present. Combination of the autonomic monitoring equipment and in-vitro presentation of the stimuli would permit such a procedure.

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APPENDIX A

QUESTIONNAIRE ON ATTITUDES TOWARD THREE

KINDS OF TESTING SITUATIONS

(COLLEGE FORM)

NAME: \_\_\_\_\_  
(Please Print)

AGE: \_\_\_\_\_ SEX: Male \_\_\_\_\_ Female \_\_\_\_\_

This questionnaire is designed to give you an opportunity to indicate how you feel in regard to three types of testing situations:

- a) the group intelligence or aptitude test, such as you took upon entrance to college,
- b) the course examination,
- c) the individual (face-to-face) type of intelligence test

One of the main reasons for constructing this questionnaire is the fact that very little is known about peoples' feelings toward the taking of various kinds of tests. We can assume that people differ in the degree to which they are affected by the fact that they are going to take a test or by the fact that they have taken a test. What we are particularly interested in here is how widely people differ in their opinions of and reactions to the various kinds of testing situations.

The value of this questionnaire will in large part depend on how frank you are in stating your opinions, feelings, and attitudes. Needless to say, your answers to the questions will be kept strictly confidential; they will under no circumstances be made known to any instructor or official of the university.

We are requesting you to give your name, age, and sex because this information may be necessary for research purposes.

Each of you has taken a course examination and a group intelligence or aptitude test, but not all of you have taken an individual intelligence test. Those of you who have not taken such a test are requested to answer the relevant questions in terms of how you think you would react to them. We want to know what you think, your attitudes and feelings toward taking such a test would be, and not what you think



they ought to be. Those who have taken an individual intelligence test will, of course, answer the questions in terms of what they actually experienced.

For each question there is a line or scale on the ends of which are statements of opposing feelings or attitudes. In the middle of the line you will find either the word "Midpoint" or a phrase, both of which are intended to reflect a feeling or attitude which is in between the statements of opposing feelings described above. You are asked to put a mark (X) on that point on the line which you think best indicates the strength of your feeling or attitude about the particular question. The midpoint is only for your guidance. Do not hesitate to put a mark on any point on the line as long as that mark reflects the strength of your feeling or attitude.

If you have any questions at this time, please ask the person who has passed out the questionnaires.

THERE ARE NO "CATCH" QUESTIONS IN THIS QUESTIONNAIRE, PLEASE READ EACH QUESTION AND EACH SCALE VERY CAREFULLY. THERE IS NO TIME LIMIT.

THE MIDPOINT IS ONLY FOR YOUR GUIDANCE. DO NOT HESITATE TO PUT A MARK (X) ON ANY POINT ON THE LINE AS LONG AS THAT MARK REFLECTS THE STRENGTH OF YOUR FEELING OR ATTITUDE.

### SECTION I

The following questions relate to your attitude and experience with group intelligence or aptitude tests. By group intelligence tests we refer to tests which are administered to several individuals at a time. These tests contain different types of items and are usually paper and pencil tests with answers requiring either fill-ins or choices of several possible answers. Scores on these tests are given with reference to the standing of the individual within the groups tested or within specific age and educational norms. Tests required for entrance to college represent this type of test. Please try to remember how you usually reacted toward these tests and how you felt while taking them.

1. How valuable do you think group intelligence tests are in determining a person's ability?

very valuable	Valuable in some respects and valueless in others	valueless
---------------	--	-----------

2. Do you think that group intelligence tests should be used more widely than at present to classify students?

should be used less widely	Should be used as at present	should be used more widely
-------------------------------	---------------------------------	-------------------------------

3. Would you be willing to stake your continuance in college on the outcome of a group intelligence test which has previously predicted success in a highly reliable fashion?

---

Very willing	Uncertain	Not willing
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4. If you know that you are going to take a group intelligence test, how do you feel beforehand?

---

Feel very unconfident	Midpoint	Feel very confident
-----------------------	----------	---------------------

5. After you have taken a group intelligence test, how confident do you feel that you have done your best?

---

Feel very unconfident	Midpoint	Feel very confident
-----------------------	----------	---------------------

6. When you are taking a group intelligence test, to what extent do your emotional feelings interfere with or lower your performance?

---

Do not interfere at all	Midpoint	Interfer a great deal
----------------------------	----------	--------------------------

7. Before taking a group intelligence test, to what extent are you aware of an "uneasy" feeling?

---

Am very much aware of it	Midpoint	Am not aware of it at all
-----------------------------	----------	------------------------------

8. While taking a group intelligence test, to what extent do you experience an accelerated heartbeat?

---

Heartbeat does not accelerate at all	Midpoint	Heartbeat noticeably accelerated
---	----------	-------------------------------------

9. Before taking a group intelligence test to what extent do you experience an accelerated heartbeat?

---

Heartbeat does not accelerate at all	Midpoint	Heartbeat noticeably accelerated
---	----------	-------------------------------------

10. While taking a group intelligence test to what extent do you worry?

---

Worry a lot	Midpoint	Worry not at all
-------------	----------	------------------

11. Before taking a group intelligence test to what extent do you worry?

---

Worry a lot	Midpoint	Worry not at all
-------------	----------	------------------

12. While taking a group intelligence test to what extent do you perspire?

---

Perspire not at all	Midpoint	Perspire a lot
---------------------	----------	----------------

13. Before taking a group intelligence test to what extent do you perspire?

---

Perspire not at all	Midpoint	Perspire a lot
---------------------	----------	----------------

14. In comparison with other students how often do you think of ways of avoiding a group intelligence test?

---

Less often than other students	As often as other students	More often than other students
-----------------------------------	-------------------------------	-----------------------------------

15. To what extent do you feel that your performance on the college entrance tests was affected by your emotional feelings at the time?

---

Affected a great deal	Midpoint	Not affected at all
--------------------------	----------	------------------------

## SECTION II

The following questions relate to your attitude toward individual intelligence tests and your experience with them. By individual intelligence tests we refer to tests which are administered to one individual at a time by an examiner. These tests contain different types of items and thus present a variety of tasks. These tasks can be both verbal and manipulative, i.e. verbal or written answers to questions or manipulations of objects such as is involved in puzzles, form boards, etc. Please try to remember how you have usually reacted toward these tests or how you would expect to react to them.

16. Have you ever taken any individual intelligence tests?  
           Yes                            No                            (Circle the appropriate answer)

IF your answer to the above question is yes, indicate in the questions below how you do or did react to individual intelligence tests?

IF your answer to the above question is no, indicate in the following questions how you think you would react to or feel about individual intelligence tests.

17. When you are taking an individual intelligence test, to what extent do (or would) your emotional feelings interfere with your performance?

---

Would not interfere with it at all	Midpoint	Would interfere a great deal
---------------------------------------	----------	---------------------------------

18. If you know that you are going to take an individual test, how do you feel (or expect that you would feel) beforehand?

Would feel very unconfident	Midpoint	Would feel very confident
-----------------------------	----------	---------------------------

19. While you are taking an individual intelligence test, how confident do you feel (or expect that you would feel) that you are doing your best?

Would feel very confident	Midpoint	Would feel very unconfident
---------------------------	----------	-----------------------------

20. After you have taken an individual intelligence test, how confident do you feel (or expect that you would feel) that you have done your best?

Would feel very unconfident	Midpoint	Would feel very confident
-----------------------------	----------	---------------------------

21. Before taking an individual intelligence test, to what extent are you (or would you be) aware of an "uneasy" feeling?

Am not aware of it at all	Midpoint	Am very much aware of it
---------------------------	----------	--------------------------

22. While taking an individual intelligence test to what extent do you (would you) experience an accelerated heartbeat?

Heartbeat does not accelerate at all	Midpoint	Heartbeat noticeably accelerated
--------------------------------------	----------	----------------------------------

23. Before taking an individual intelligence test to what extent do you (would you) experience an accelerated heartbeat?

Heartbeat does not accelerate at all	Midpoint	Heartbeat noticeably accelerated
--------------------------------------	----------	----------------------------------

24. While taking an individual intelligence test to what extent do you (would you) worry?

Worry a lot	Midpoint	Worry not at all
-------------	----------	------------------

25. Before taking an individual intelligence test to what extent do you (would you) worry?

Worry a lot	Midpoint	Worry not at all
-------------	----------	------------------

26. While taking an individual intelligence test to what extent do you (would you) perspire?

Would never perspire	Midpoint	Would perspire a lot
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27. Before taking an individual intelligence test to what extent do you (would you) perspire?

Would never perspire	Midpoint	Would perspire a lot
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28. In comparison to other students, how often do you (would you) think of ways of avoiding taking an individual intelligence test?

More often than other students	As often as other students	Less often than other students
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### SECTION III

The following questions relate to your attitude and experience with course examinations. We refer to major examinations, such as mid terms and finals, in all courses, not specifically in any one course. Try to represent your usual feelings and attitudes toward these examinations in general, not toward any specific examination you have taken. We realize that the comparative ease or difficulty of a particular course may influence your attitude toward the examination; however, we would like you to try to express your feelings toward course examinations generally. Remember that your answers to these questions will not be available, at any time, to any of your instructors or to any official of the institution.

29. Before taking a course examination, to what extent are you aware of an "uneasy" feeling?

Am not aware of it at all	Midpoint	Am very much aware of it
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30. When you are taking a course examination, to what extent do you feel that your emotional reactions interfere with or lower your performance?

Do not interfere with it at all	Midpoint	Interfere a great deal
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31. If you know that you are going to take a course examination, how do you feel beforehand?

Feel very unconfident	Midpoint	Feel very confident
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THE MIDPOINT IS ONLY FOR YOUR GUIDANCE. DO NOT HESITATE TO PUT A MARK (X) ON ANY POINT ON THE LINE AS LONG AS THAT MARK REFLECTS THE STRENGTH OF YOUR FEELING OR ATTITUDE.

32. After you have taken a course examination, how confident do you feel that you have done your best?

Feel very unconfident	Midpoint	Feel very confident
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33. While taking a course examination, to what extent do you experience an accelerated heartbeat?

Heartbeat does not accelerate at all	Midpoint	Heartbeat notice- ably accelerated
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34. Before taking a course examination, to what extent do you experience an accelerated heartbeat?

Heartbeat does not accelerate at all	Midpoint	Heartbeat noticeably accelerated
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35. While taking a course examination, to what extent do you worry?

Worry a lot	Midpoint	worry not at all
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36. Before taking a course examination, to what extent do you worry?

Worry a lot	Midpoint	Worry not at all
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37. While taking a course examination, to what extent do you perspire?

Never perspire	Midpoint	Perspire a lot
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38. Before taking a course examination, to what extent do you perspire?

Never perspire	Midpoint	Perspire a lot
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39. When, in your opinion, you feel well prepared for a course examination, how do you usually feel just before the examination?

confident	Midpoint	Anxious
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THE MIDPOINT IS ONLY FOR YOUR GUIDANCE. DO NOT HESITATE TO PUT A MARK (X) ON ANY POINT ON THE LINE AS LONG AS THAT MARK REFLECTS THE STRENGTH OF YOUR FEELING OR ATTITUDE.

## APPENDIX B

### RATIONALE FOR SUBJECTS IN IMPLOSIVE THERAPY GROUP

This is a research project designed to study test anxiety. You have been selected from among a large number of students who indicated that they had anxiety associated with taking tests and examinations. I will meet with you in this room for thirty minutes this afternoon and for thirty minutes on Monday and Thursday afternoons of the two following weeks.

In the field of psychology, there are several views concerning the nature of anxiety associated with various situations. This study aligns itself with the behavioristic view which states that the irrational anxiety is the direct result of previous learning or conditioning. Behaviorists concern themselves with the symptom, the observable consciously experienced problem being manifested. Treatment is aimed at the removal of the symptom, namely, the reduction of the irrational anxiety. Behaviorists do not concern themselves with presumed underlying causes or conflicts. Their main goal is the alleviation of the presenting problem.

Test anxiety is very similar to other unadaptive fears and anxieties. The defining characteristic of unadaptive anxiety or phobic behavior is the experiencing of irrational anxiety and the desire to escape or avoid the feared situation. In claustrophobia, there is a fear of

enclosed confining places. When a person who suffers from claustrophobia finds himself in a small, confining place, he immediately takes or desires to take the necessary behavior to flee the anxiety-evoking situation. We know from learning research that when someone escapes or avoids an anxiety-evoking situation, that particular situation is strengthened in its ability to evoke anxiety. When a claustrophobic escapes from a confining situation, the net result is the maintaining and strengthening of his fear of such situations. Many students experience anxiety that is so intense that they try to avoid or escape taking tests. This wish to escape and avoid taking tests serves to reinforce and maintain their fear of tests.

An important principle of learning is called extinction. I believe that this process of extinction will be helpful in reducing your anxiety associated with taking tests. Basically, what I would like for you to do would be to imagine various scenes and situations that are associated with taking tests and to concentrate on experiencing as much anxiety as you can. An important factor in maintaining fear of tests is your desire to escape or to avoid test taking situations. As long as you experience the desire to escape or avoid a situation, anxiety will be associated with that situation. By concentrating on visualizing scenes associated with taking tests and intensely experiencing the anxiety elicited, your desire to escape or avoid testing situations will decrease greatly.

During the remainder of this session and in the following four sessions, I am going to have you imagine and visualize several anxiety



situations associated with taking tests. During these sessions, I would like for you to remain silent and to keep your eyes closed. Whenever you feel anxious, I want you to signify this by raising your left index finger. Keep your finger raised as long as you are feeling anxious. When you no longer feel anxious, signify this by lowering your finger.

I want you to now imagine as vividly as you can, and to concentrate on experiencing as intensely as you can, the anxiety associated with the scenes that I describe.

## APPENDIX C

### TEST ANXIETY HIERARCHY

1. Preparing to take an important individual intelligence test
2. Taking the important individual intelligence test
3. Receiving the results of the individual intelligence test
4. Getting ready to take an important group intelligence test
5. Taking the important group intelligence test
6. Receiving the results of the important group intelligence test
7. Sitting in a class when an important final exam is unexpectedly announced
8. Preparing to take the important final exam
9. Taking the important final exam
10. Receiving the results of the important final examination

## APPENDIX D

### DETAILED INSTRUCTIONS PERTAINING TO TEST ANXIETY HIERARCHY

Scene 1: Preparing to take an important individual intelligence test

This test is vitally important to you. A high score on it will enable you to obtain a good position that you desperately want. It is so important that it makes you intensely anxious as the time for the test approaches. Your family and all of your friends are aware of the importance of this test. You are anxious, very anxious, as you contemplate taking the test. You feel your muscles tighten up, a lump develops in your throat, and you become increasingly anxious as the time approaches. Concentrate on experiencing this anxiety! Experience it as intensely as you can! Think of all the frightening and sickening consequences that would follow if you did poorly.

Scene 2: Taking the important individual intelligence test

You enter the examination room and the person who is going to test you greets you in a cold, indifferent voice. He tells you that he is ready to start; and by the manner in which he tells you this, you get the impression that he thinks that you will not do well. Your palms are moist, your muscles are tense, and you feel anxious, very anxious. The examiner begins the testing procedure and you get the

first few questions correct. On the fourth question, you pull a blank. You know the answer, but you cannot recall it. You are trying hard to remember the answer, but you can't. You become more and more anxious. The examiner tells you that the time is up, and you move on to other questions. You want to do well, but you can't because you are very anxious. You feel stupid because you missed some simple items. The questions become more difficult. You begin to perspire as you try to answer them. As it continues, there are more and more questions that you cannot answer. Your anxiety increases to an almost unbearable level. You are thinking about how important this test is and how much it means to you. Finally the test is over, and the examiner grabs your paper and murmurs under his breath that it was a waste of time, and that you are very stupid. You leave realizing that you did poorly. Feel this anxiety as intensely as you can.

Scene 3: Receiving the results of the individual intelligence test

You are in a large room full of students. A teacher is calling out individual names and reading their scores on the individual I.Q. test that they took. You are anxious because you realize that you didn't do well on the examination. The teacher continues to call out names and reports high scores. As the names and scores are called out, the other students applaud. Finally, the teacher gets closer to your test. You are very anxious as you anticipate your score being called out. You look around at the other students who did well on the test, and you feel foolish and awkward. Finally the teacher reads your name out loud. You gasp! You feel a sinking sensation in

the pit of your stomach. You wish you could hide, but all eyes are on you. The teacher calls your name out again and mumbles something about what a low score you made. He reads your score out loud, and it is the lowest score of all. You feel terrible as everybody in the room stares at you. Experience this anxiety as intensely as you can.

Scene 4: Getting ready to take an important group intelligence test

This is an important group I.Q. test, and in order to stay in college, get a better job, and make more money, you need to do well on this test. All of your friends and relatives are proud of you for being in college. They would be very disappointed in you if you don't do well on this test. This makes you worry about doing well. You become more and more anxious as the time for taking the group I.Q. test approaches. You experience a sinking sensation in the pit of your stomach, your muscles tighten, and your palms become moist as you think about it. Concentrate on feeling this anxiety. You finally reach the point where you are so anxious and nervous that all you do is worry about the upcoming group I.Q. test.

The day arrives in which you are to take the group I.Q. test. You wake up that morning feeling sick. You are obsessed with the fear of failing the group I.Q. test. You can't eat breakfast because you are literally sick with fear. You tremble and perspire; your head aches, and your muscles are tense as this fear of failure grips you. Experience the fear as intensely as you can. Imagine the situation as vividly as you can, and experience the anxiety associated with the scene.

Scene 5: Taking the important group intelligence test

The day for taking the important group I.Q. test arrives. You leave home and head toward school. Your anxiety becomes greater and greater as you get closer to school. You are frightened and anxious as you finally find the building where the examination is to be given. You see other students entering the building. They are cocky and confident, and this makes you more aware of how fearful and nervous you feel.

You take the test and you pull a blank. You can't remember anything! You panic as you sit there. Your heart is racing; you're perspiring profusely; your muscles are tense; feel this fear as strongly as you can!

Scene 6: Receiving the results of the important group intelligence test

Time passes painfully slow as you await the results of your group intelligence test. You become increasingly tense and anxious. Finally the day arrives, and you go to the crowded school auditorium where the results will be called out. You tremble and perspire as your name approaches. The announcer calls out your name and laughingly states that he is surprised that anyone could have scored so low. He calls out your score, and it is the lowest of all. Everyone turns and looks at you. You feel shame and humiliation as you stand there with all eyes on you. You want to run and hide, but you can't. Other students are pointing at you and laughing. Feel this anxiety as intensely as you can!

Scene 7: Sitting in class when an important final exam is unexpectedly announced

One day you are sitting in class, and as usual, you are feeling anxious and self-conscious. Without any previous warning, the teacher suddenly announces that he will give a very important course examination in three days! This jolts you severely because you have been putting off studying. As a result, you are totally unprepared for taking the examination. As you look around the classroom, you see that the other students are excited and appear to be looking forward to taking the exam. They are prepared for it, and you are not! You are dazed as anxiety and fear overwhelm you. Your heart is pumping wildly, your muscles are tense, and there is a lump in your throat as fear completely takes control of you. Imagine this scene as vividly as you can, and concentrate on experiencing as much anxiety as you can.

Scene 8: Preparing to take the important final exam

You are sitting in class, and it is a few minutes before the beginning of the important final class exam. As you sit there looking around the room, you notice that the other students are joking about how well they will do. They all appear to be very confident, and they all expect to do well. The exam will be curved, so you know that the better they do, the harder it will be for you to make a good score. You are so nervous and anxious that you sit there trembling and perspiring. You are frightened because you know you are not prepared for taking this test. The teacher held off announcing the exam on purpose to catch students who have not been keeping up. He caught you!

Imagine yourself in this situation. Imagine how uncomfortable you would feel. Let yourself go; put yourself in this situation and feel as much anxiety and fear as you can.

Scene 9: Taking the important final exam

Your teacher comes in and immediately starts writing questions on the blackboard. You look at the first few questions, and you realize with a shock that you cannot answer them. The teacher then tells the class that he wants every question answered, and he warns against guessing. He is asking specific questions, and he wants specific answers. He then writes all of the remaining questions on the blackboard. You have difficulty swallowing as you read them. Your palms are moist as you grip your pen. All of the questions pertain to material that you have read, but you cannot recall enough information to answer them. You look around the room, and you see that the other students are eagerly answering all of the questions correctly. You sit there feeling anxious and stupid because you cannot recall the information. Finally you decide to guess, and you begin to write out the answers to the questions.

As you leave the class, you notice that all of the students are happy and confident that they did well. You feel awkward and humiliated as you hear them telling each other how well they did. A group of students come up to you and ask how you think you did. You mumble something noncommittally about having a question on something, and you walk away quickly. Experience this fear, humiliation, and the shame



of this situation. Imagine how you would feel in this situation. Feel this anxiety as intensely as you can!

Scene 10: Receiving the results of the important final examination

You have been sick all week as you wait to receive the results of your examination. You get to class early and notice that the other students are there confidently waiting for their results. They appear to be relaxed and you feel that they did well. You feel just miserable as you nervously sit in your seat. The teacher strides into the room and states that he is proud of the class because everyone did well, with one notable exception. He then looks at you! Your heart skips a beat as he stares at you. You start perspiring, your muscles start to twitch, and you get a sinking feeling in your stomach.

The teacher begins to call out grades and everyone is doing exceptionally well. He comes closer to your name, and your anxiety reaches the point where it is almost uncontrollable. You fight the sickening sensation of panic that is sweeping over you. He finally calls out your name and your score is the lowest of anyone in the class. Everybody in the room turns and stares at you as he repeats your score and states that it is the lowest score he has ever given a student. All eyes in the room are on you. Experience this anxiety as you imagine this situation as vividly as you can!

## APPENDIX E

### RATIONALE FOR SUBJECTS IN PLACEBO-ATTENTION GROUP

This is a research project designed to study test anxiety. You have been selected from among a large number of students who indicated that they had anxiety associated with taking tests and examinations. I will meet with you in this room for thirty minutes this afternoon and for thirty minutes on Monday and Thursday afternoons of the two following weeks.

In the field of psychology, there are several views concerning the nature of anxiety associated with various situations. This study aligns itself with the behavioristic view which states that the irrational anxiety is the direct result of previous learning or conditioning. Behaviorists concern themselves with the symptom, the observable consciously experienced problem being manifested. Treatment is aimed at the removal of the symptom, namely, the reduction of the irrational anxiety. Behaviorists don't concern themselves with presumed underlying causes or conflicts. Their main goal is the alleviation of the presenting problem.

Test anxiety is very similar to other unadaptive fears and anxieties. The defining characteristic of unadaptive anxiety or phobic behavior is the experiencing of irrational anxiety and the desire to escape or avoid the feared situation. In claustrophobia, there is a fear of

enclosed places. When a person who suffers from claustrophobia finds himself in a small, confining place, he immediately takes or desires to take the necessary behavior to flee the anxiety-evoking situation. We know from learning research that when someone escapes or avoids an anxiety-evoking situation, that particular situation is strengthened in its ability to evoke anxiety. When a claustrophobic escapes from a confining situation, the net result is the maintaining and strengthening of his fear of such situations. Many students experience anxiety that is so intense that they try to avoid or escape taking tests. This wish to escape and avoid taking tests serves to reinforce and maintain their fear of tests.

I believe that a major problem associated with test anxiety is the inability of those who experience this anxiety to use their imagination effectively enough to allow them to imagine or visualize enjoyable scenes and situations. Therefore, for the remainder of this session and the following four sessions, I would like for you to concentrate on my instructions. I will describe various scenes to you. I would like for you to then close your eyes and experience the sensations that accompany your visualization of these scenes.

APPENDIX F

PLACEBO-ATTENTION GROUP LIST  
OF NON-RELEVANT ITEMS

1. Admiring a Beautiful Painting
2. Enjoying a Beautiful Day in the Park
3. Bicycle Riding
4. Swimming
5. Hiking
6. Cleaning Apartment or Room
7. Grocery Shopping
8. Driving a Car
9. Washing Clothes
10. Preparing a Meal

## APPENDIX G

### DETAILED INSTRUCTIONS PERTAINING TO NON-RELEVANT STIMULI

#### Scene 1: Admiring a Beautiful Painting

You are walking through a famous museum and you suddenly come upon a beautiful painting that captures your attention and evokes memories familiar to you. As you stand there, you experience various sensations. You want to move on but you find yourself glued to the spot. I will now pause as you experience the various sensations associated with this scene.

#### Scene 2: Enjoying a Beautiful Day in the Park

Imagine that it is a beautiful day and that you are by yourself in the park. The air is clean, the temperature is pleasant, and you are really enjoying being there. Visualize this scene and concentrate on experiencing any sensations and feelings that accompany this visualization.

#### Scene 3: Bicycle Riding

It is a Saturday morning and you are bicycle riding. It is a pleasantly cool morning and you are on a deserted road. Visualize this scene and concentrate on experiencing the accompanying sensations.

#### Scene 4: Swimming

It is a hot June afternoon and you are enjoying a swim in a pool. The water is cool and refreshing. Visualize this scene and concentrate on experiencing the accompanying sensations.

### Scene 5: Hiking

Today you have decided that a hike through the park would be an ideal way to fill your lungs with air and get your heart to pump vigorously. You begin your day just as the sun begins to rise. The air is damp and chill. Visualize this scene and concentrate on experiencing the accompanying sensations.

### Scene 6: Cleaning Apartment or Room

Today is one of those rare moments when the most enjoyable way you would like to spend the morning would be to put your apartment or room in order. Beginning the task is a rather unpleasant experience. As you look around the room, you don't know where to begin. As you plunge into it, you find yourself enjoying it. As you contemplate throwing away your old junk, you sit and think of the memories behind these articles. Visualize this scene and concentrate on experiencing the accompanying sensations.

### Scene 7: Grocery Shopping

Today is grocery shopping day. This is a new experience for you, and you relish it as it represents your independence. As you walk slowly up and down the aisles, you think of the many exotic meals that you will prepare. Visualize this scene and concentrate on experiencing the accompanying sensations.

### Scene 8: Driving a Car

As you pull out the driveway in your new car, you feel the sense of pride of ownership. Today you have decided to explore the unknown. You begin your journey with a sense of adventure. Visualize this scene and concentrate on experiencing the accompanying sensations.

Scene 9: Washing Clothes

Today is wash day. The laundry is buzzing with activity. You find a quiet spot in which to wait. You have the hour to yourself. Concentrate on experiencing the accompanying sensations.

Scene 10: Preparing a Meal

Today you have found an exciting new recipe. You have decided to try this new dish. As you begin to cook the meal, you find that your taste buds have come alive. Visualize this scene and concentrate on experiencing the accompanying sensations.

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