A PHYSIOLOGICAL INVESTIGATION OF DESENSITIZATION THERAPY WITH PUBLIC SPEAKING ANXIETY

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ABSTRACT

A PHYSIOLOGICAL INVESTIGATION OF DESENSITIZATION THERAPY WITH PUBLIC SPEAKING ANXIETY

by Paul E. Laemmle

Twenty-four male students who experienced extreme anxiety while giving a speech were selected from a population of 450 male students enrolled in Speech 101 at Michigan State University to participate in this study. These students were randomly assigned to four groups to help them reduce their public speaking anxiety. There were three treatment groups and one "no treatment" control group. The three treatment groups were: (a) two systematic desensitization therapy groups and (b) one *in vivo* desensitization group.

The purposes of this investigation were as follows: (a) to determine the effectiveness of systematic desensitization and *in vivo* desensitization in reducing public speaking anxiety, (b) to investigate the differences between visual imagery anxiety and situational anxiety of those *Ss* receiving systematic desensitization treatment, and (c) to investigate the relationships among three types of anxiety measurement: heart rate measures, motoric measures, and self-report measures.

A transistorized bio-telemetry recording system was used to record heart rate of all subjects throughout the research program. Subjects were physiologically monitored while giving a speech before an audience of students and speech experts before and after the formal treatment. Each subject also completed several self-report scales of anxiousness before and after treatment. In addition, all subjects were behavioraly rated by five trained speech experts while giving their speech. Each subject was used as his own control and the change scores from pre-treatment to post-treatment measures were evaluated to detect differences among treatment groups. A one-way analysis of variance was used to determine the differences among groups using the change scores of the pre- and post-treatment measures.

Subjects receiving the systematic desensitization treatment were monitored physiologically during each treatment session. This was done in order to investigate the relationship of visual imagery during treatment and situational anxiety during speeches.

Results indicated that systematic desensitization was more effective in reducing public speaking anxiety than in vivo desensitization and "no treatment" control group. The criteria for success in this case were heart rate and three highly correlated self-report measures. In vivo desensitization proved to be more

effective in reducing public speaking anxiety than "no treatment" using the heart rate criterion only. Self report and motoric indices did not support the results.

There were significant differences found between situational anxiety arousal and visual imagery arousal; however, there was a positive relationship between the two. As the situational anxiety went down over treatment so did visual imagery anxiety. Introverts had a higher positive relationship of imagery to situational anxiety than did extroverts (as measured by the Myers-Briggs Personality Type Indicator).

Results also showed low correlations among the three measures of anxiety. The motoric measure was deemed unreliable because of low inter-rater reliability. Self-report and heart rate measures were not significantly correlated.

Implications for further research were proposed.

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By

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To Sue, Holly, Laura, and Spencer

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CHAPTER I

THE NATURE OF THE PROBLEM

The present investigation was initiated to explore a few specific aspects of systematic desensitization therapy with public speaking anxiety of college students. Recently there has been much research focusing on systematic desensitization (see definition). Lazarus has published many studies of his research in systematic desensitization with stutterers, frigid women, and illustrative problems, including agoraphobia, social anxiety, claustrophobia, reactive depression, hyperventilation syndrome, etc. (Lazarus, 1960, 1961, 1963a, 1963b, 1964a, 1964b, 1964c, 1965a, 1965b, 1965c, 1966). Paul has investigated the effects of systematic desensitization therapy and insight therapy in the treatment of public speaking anxiety of college students (1966). The results of these research findings have been based mainly on paper and pencil self-report tests of anxiety which are subject to social desirability. Often post tests of anxiety change are affected by the experimenter's and/or subject's invested expectations. One way to obtain more objective measurements of anxiety would be to use

physiological indicators of anxiety such as heart rate, galvanic skin response, electroencephalograph recordings, etc.

Wolpe (1958) assumes in his theory of reciprocal inhibition an anxiety equivalence between the real anxiety-producing situation and the anxiety obtained through visual imagery during the formal desensitization treatment. During a recent pilot study questions arose as to whether all students were able to obtain equal anxiety arousal during visual imagery and the real situation (Laemmle and Thoresen, 1967). Also some questions have been raised about the type of person who might benefit most from systematic desensitization therapy (Wolpin, 1966).

Need for the Study

Through a recent pilot study employing systematic desensitization therapy to decrease test taking anxiety, the author found discrepancies among self-reported measures of anxiety, physiological measures, and observer ratings of anxiety. The study also revealed the difficulty which some people have in experiencing as much anxiety in a visually imagined situation as in the real situation; in this case it was a test taking situation (Laemmle and Thoresen, 1967). Also it seemed that the relaxation training was the most beneficial phase of desensitization. Since the anxiety measures were

inconsistent, the present research design will investigate the relationships among those measures. Also since there were some discrepancies between visual imagery arousal and real life arousal, that relationship will also be explored.

The systematic desensitization treatment will be compared against *in vivo* desensitization (see definition) to help determine whether the formal desensitization procedure is more effective in reducing public speaking anxiety than just relaxation techniques coupled with the real situation.

Both systematic desensitization treatment and *in vivo* desensitization treatment will be compared against a "no treatment" control to determine any differences between the two groups in anxiety reduction.

Problem to Be Investigated

The purpose of this study is to investigate the effectiveness of systematic desensitization and to explore the psychophysiological reactivity to systematic desensitization therapy of subjects who experience public speaking anxiety. The primary emphasis is aimed at uncovering differences among measures and at examining discrepancies between visual imagery anxiety and situational anxiety.

Statement of Research Hypotheses

This research project is an attempt to investigate a few basic questions concerning the treatment of systematic desensitization therapy emphasizing a pre-post experimental design using various measures of anxiety arousal.

The following research hypotheses were developed in order to test some of the implications arising from the previous discussion of the problem.

Hypothesis I: There is a difference between subjects' physiological anxiety arousal level in a real anxiety provoking situation and in visual imagery.

Hypothesis II: There is a difference between the effects of systematic desensitization therapy and *in vivo* desensitization therapy in the reduction of anxiety.

Hypothesis III: There is a difference between the effects of systematic desensitization therapy and the "no treatment" control group in the reduction of anxiety.

Hypothesis IV: There is a difference between the effects of *in vivo* desensitization and the "no treatment" control group in the reduction of anxiety.

Hypothesis V: There is a positive correlation between self reported anxiety and physiologically reported anxiety.

Hypothesis VI; There is a positive correlation between observer ratings of anxiety and physiologically reported anxiety.

Hypothesis VII: Subjects are able to attain deeper relaxation during each successive therapy treatment as measured by heart rate.

Definition of Terms

Systematic desensitization therapy is a technique developed by Wolpe (1958) which denotes inhibition of an anxious response by using a progressive relaxation procedure based on Jacobson's technique (1938).

Physiological anxiety in this research study refers to anxiety measured by electrocardiograph recordings of heart rate.

In vivo desensitization therapy refers to the use of the relaxation procedure immediately prior to the real life speaking situation.

The visual imagery situation is the experiencing, through therapist-assisted mental fantasy of an anxiety provoking situation (in this case public speaking).

Limitations of the Study

One limitation of the study is the inability to use multiple physiological measures of anxiety concurrently. The reason for this is that some measures were not yet developed to be used in a wireless application at the time the research was initiated. This study employed wireless telemetry equipment to cut down on "laboratory effect."

A second limitation is in the selection of subjects. Females were not used in this study because of the confounding physiological changes that occur when women go through menses. These changes would affect the electrocardiograph recordings in an unpredictable manner.

Organization of Thesis

The thesis is organized according to the following plan: Chapter I outlines the general background and need for such a study. Chapter II presents a review of the prior research on the problem. Chapter III is concerned with the methodology and procedures used in the study. The subjects, apparatus and statistical procedures are described. In addition, Chapter III outlines the operational hypotheses and defines the terms used in these hypotheses. Chapter IV presents the results of the experimentation. Chapter V presents a discussion of the findings with implications for future research. Chapter VI is a brief summary of the study.

CHAPTER II

REVIEW OF RELATED RESEARCH

Systematic desensitization was pioneered and developed by Joseph Wolpe in the mid 1940's. Wolpe's research was guided by the Hullian concept of "conditioned inhibition" (Hull, 1943). Wolpe undertook a series of animal studies which led him to the conclusion that the most satisfactory way of treating "conditioned" anxiety was through a gradual counterconditioning approach (Wolpe, 1948, 1952, 1958). Wolpe describes the process through his experiments with cats:

> In the neuroses produced in cats by administering high voltage, low amperage shocks to them while confined in a small cage, it was found that the anxiety responses conditioned to the cage and related stimuli and to an auditory stimulus that had preceded the shocks were extremely resistant to the normal process of extinction. Neither prolonged nor repeated exposure of the animals to the environment of the cage led to decrements in the intensity of these responses, even though the animals were never again shocked. However, because they showed milder anxiety on the floor of the experimental laboratory and still less in a series of other rooms, graded according to their degree of resemblance to the laboratory, they were offered food in these various places in descending order of similarity. When, in a particular room, the evocation of anxiety was not great enough to inhibit feeding, successive offerings of food were eaten with increasing readiness while all signs of anxiety receded to vanishing point. The room next in resemblance to the experimental laboratory could then be dealt with. After

> a series of similar steps, eating behavior was eventually restored in the experimental cage itself, and this made possible the total elimination of all signs of anxiety even there. In parallel piecemeal fashion, anxiety was deconditioned from the auditory stimulus that had preceded the shocks (Wolpe, 1966, p. 56).

Historical Background

Research with animals and humans suggests there is good reason to believe that human neuroses consist essentially of persistent maladaptive habits of anxiety responses and that "neurotic anxiety" can be overcome by applying procedures derived from principles of learning, moreover, it is not followed by relapse or symptom substitution, if treatment is efficiently and thoroughly carried out (Bandura, 1961). Particularly effective use has been made of the principle of reciprocal inhibition (Wolpe, 1958; Wolpe and Lazarus, 1966) which was first identified by Sherrington (1947) in the context of spinal reflexes. According to this principle, the ability of given stimuli to evoke anxiety will be permanently weakened (and hence, the anxiety alleviated), "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 . . ." (Wolpe, 1958, p. 71). Wolpe then proceeded to define gross response patterns with humans which were both manipulable and incompatible with anxiety.

Wolpe experimented with Salter's conditioned reflex therapy (1949) and tried using assertive behavior in conjunction with the anxiety producing situation to decrease the anxiety. However, Wolpe found that assertive behavior alone did not reduce anxiety. For example, a person who had a fear of being alone would not succeed in becoming less fearful through acts of assertion (Wolpe, 1966).

The search for an anxiety inhibitory response led Wolpe to Jacobson's progressive relaxation (1938) which provided an anxiety inhibitor in the form of deep muscle relaxation. Wolpe soon found that in vivo relaxation was impractical because the anxiety eliciting stimuli could not be controlled and that it involved a very prolonged and assiduous program of relaxation training with a real-life phobic stimulus (usually 50 to 200 sessions) (Wolpe, 1966, p. 58). He then began experimenting with phobic clients who were asked to confront anxiety-eliciting stimuli only by imagining their presence, assuming that the imaginal presentation of such stimuli were an effective substitute for concrete or "real" stimuli. Thus in the early 1950's Wolpe developed a treatment package for human anxiety which he called "systematic desensitization." "The incompatible response was deep muscle relaxation, and the counterconditioning procedure was followed by presenting anxiety-eliciting stimuli

through imagery in a hierarchial order from least to most disturbing" (Franks, in press).

Current Empirical Investigations

There has been much research initiated in desensitization since 1952. The major portion of the research shows desensitization to be an effective anxiety reducer; and when compared to other techniques of psychotherapy, desensitization therapy is significantly more effective in reducing anxiety (Paul, in press). Lang and Lazovik (1964), found greater fear reduction in snake phobic subjects who underwent desensitization versus the control or placebo treatment subjects. Paul (1966) found a significantly greater reduction in anxiety for desensitized subjects in a beginning college speech course when compared to similar groups given insight therapy, placebo treatment or no treatment. Emery (in press) found that students desensitized for test taking anxiety rated themselves as significantly less anxious about examinations, both before and during their final examination, as compared with a no treatment control group. Moore (1965) found significant improvement in subjects desensitized for bronchial asthma.

Research on the Technique of Desensitization

Systematic desensitization employs three separate sets of operations: (a) training in deep muscle

relaxation, (b) the construction of anxiety hierarchies, and (c) counterposing relaxation and anxiety evoking stimuli from the hierarchies (Wolpe, 1966). In a recent pilot study using test anxious students, the author found that many of the students felt that the relaxation alone was the most important part of the technique and that it did as much for them as the complete desensitization package (Laemmle and Thoresen, 1967), Zeisset (1966) reported the first attempt to compare systematic desensitization with applied relaxation procedures. He randomly assigned "interview anxious" hospitalized individuals to four groups: (a) systematic desensitization, (b) relaxation plus application, (c) an attention-placebo treatment, and (d) a no treatment group. He found no significant differences between the desensitization group and the relaxation group, although both produced significantly greater reductions in anxiety than either attention-placebo or untreated controls. The investigation raised the possibility that relaxation alone was the most important variable of the two treatments. Cooke (1966) found no difference between the effects of in vivo desensitization and systematic desensitization with rat phobic students.

Visual Imagery

Another important aspect of the desensitization procedure lies in the ability of subjects to imagine

visually anxiety-invoking situations. Paul (in press) found that a number of failures in desensitization may be due to difficulty in imagery, in which "avoidant thinking patterns preclude responses to visualization." Paul also went on to say that "these difficulties do not appear related to any identifiable characteristics of clients, and often respond to training" (Paul, in press).

Wolpin (1966) describes a study of systematic desensitization which suggests that introverts may gain more from desensitization than extroverts. Referring to visual imagery, a factor in his study, he hypothesized that the more introverted subjects may have had more practice with visual imagery as they may live in fantasy more. This may have implications for greater success of the systematic desensitization procedure with introverts since it depends on ability to use imagery. Lazarus (1963b), in a similar study, found that the most successful cases scored low on extroversion and high on introversion.

Desensitization Assessment Procedures

In a recent review of literature Paul (in press) states that the greatest need for future research on desensitization must be the development of adequate instruments for reliable assessment and description of client's distressing behaviors, characteristics, and life environment.

There has been recent interest in the use of physiological measures (Cowden and Ford, 1962; Davison, 1965) as being potentially capable of providing more valid indications of anxiety levels. Physiological measures may also provide a better assessment of the validity of subjects self-reports, which Paul (1967) reports as being ". . . notorious for their (clients' and therapists') lack of reliability and validity" (p. 12). In the past it was not feasible to use physiological measurement equipment in psychotherapy research. One reason for this was the reduced mobility of the sucject; another was the influence the equipment might have on his behavior. A third problem was that each of the physiological systems typically assessed in anxiety research (cardiovascular, muscular, skin phenomenon, etc.) appeared to be relatively independent: it has been pointed out that inter-subject correlations of the various physiological variables are usually low and unreliable (Thayer, 1966). Possible sources of disagreement have been certain methodological problems, the issue of definition, and the variable reliability of measurement of anxiety (Buss, 1955). One definition of anxiety is as follows: "Anxiety is an emotion characterized by feelings of uneasiness which have a tendency to generalize and are not linked to a clearly recognized danger or threat" (Jenkins, 1955). Anxiety in its purest form is a set of concomitant

bodily changes relating to a state of indecision coupled with an inner urgency toward reaching a decision (Schacter and Singer, 1962). Krause (1961) states that the bodily changes which occur simultaneously with feelings of anxiety are not just coincidence. He states than "any particular physiological variable is usually justified as a measure of anxiety by the argument that it indicates autonomic or better, adreno-sympathetic activation." The convention upon which this argument rests is that one cannot be anxious or afraid without having this sort of physiological involvement.

The problem of relatively independent measures of anxiety has been partially solved by research designs that use subjects as their own controls and concentrate on intrasubject changes or use combinations of physiological measures and give most weight to systems showing greatest activation (Duffy, 1962; Lacey and Lacey, 1958).

The traditional study of emotions has emphasized reactivity, the observable side of the experience. Yet what the clinician seeks to modify is not these transient states of arousal but the more pervasive affective predisposition to response or life style termed "mood." Mood, in contrast with evoked response, "emotion," affects a significantly greater portion of behavior, provides that background for more varied types of learning, and cumulatively can produce disturbance of significantly greater magnitudes (Brown, 1966).

Undertaking the study of the tonic state of affective arousal would require major changes in research techniques and procedures (Brown, 1966). Twenty-four-hour monitoring, feasible with telemetry equipment, could trace autonomic reactivity through the varied experience of waking activity and sleep. Studies could be extended for periods of weeks or more to provide information on the existence of circadian cycles, the influence of such factors such as menses and changes in endocrine activity, or data on the possible existence of long-term trends which are simply not discernible in current, short-term studies. The continuous data produced could be reduced by on-line computers programmed to edit out insignificant variances and to plot relevant variations in cumulative histogram form as daily summaries (Brown, 1966). With such procedures, it would be possible to capitalize upon life situations in normal subjects which provoke distinguishable moods and upon the cyclic variations found in neurotic depressions or anxieties; to trace the progress of a client through a course in psychotherapy; and to plot the changes produced by drug treatments. Correlative changes might be made discernible in the case of remissions in psychosomatic states. More relevant normative data could be obtained in normal persons, and this information could be used to assess the significance of transient changes associated with brief emotional arousal (Brown, 1966).

Laemmle and Thoresen (1967) have shown through their research with test anxious students that it is indeed feasible to monitor physiological changes telemetrically in arousal during desensitization therapy. Heart rate was found to be reliable (as an index of change) when the subjects were used as their own controls. Heart rate variability and galvanic skin response changes have long been among the most frequently used physiological measures of interest to psychologists because of their accuracy in detecting emotional response (Doctor, 1964; Malmo, 1957).

Summary of the Review of Literature

1. Wolpe makes some assumptions about the effect of visual imagery in desensitization therapy. He assumes that the imaginal presentation of anxiety invoking stimuli is an effective substitute for the "real" stimuli.
2. Desensitization has been shown more effective in reducing anxiety when compared to other treatments and to no treatment control groups.
3. In vivo desensitization in some instances has been shown to be as effective in reducing anxiety as systematic desensitization.

4. The ability to imagine visually an anxiety invoking situation and experience the accompanying anxiety seems to be an important variable in the success or failure of desensitization therapy.
5. Introverts have been more responsive to desensitization than extroverts.
6. Discrepancies have been noted between self-report ratings of anxiety and physiological measures of anxiety.
7. Modern physiological telemetry methods make the measurement of anxiety less cumbersome and more reliable.

CHAPTER III

METHODOLOGY AND PROCEDURES

Twenty-four subjects who were anxious when speaking in public were selected at random from a group of forty-six volunteers selected from a population of 450 male students enrolled in a public-speaking course at Michigan State University. The subjects were randomly assigned to one of four groups: three treatment groups (two systematic desensitization groups, one in vivo desensitization group) and one "no treatment" class control group. After a time-limited treatment period, the relative efficiacy of the various treatments in alleviating anxiety was evaluated on the basis of measures (self-report, observer ratings, and heart rate recordings) obtained from two test speeches, one before treatment and one after treatment. Inter-correlations of the various tests of anxiousness were also obtained.

Subjects

Twenty-four male subjects were selected from a population of 450 male students enrolled in Speech 101 at Michigan State University. The criteria for selection

were the Ss willingness to participate in the study and his self-reported extreme anxiety while giving a speech. A letter explaining the experimental program and a brief questionnaire was distributed to all male students enrolled in the speech course. The letter explained the nature of the program and the time it would involve (see appendix). Of the 450 students contacted, forty-six indicated they were very anxious while giving a speech and that they would like help in overcoming the anxiety. Of the forty-six subjects who volunteered, twenty-four were randomly chosen and assigned to four groups: (a) systematic desensitization I, (b) systematic desensitization II, (c) in vivo desensitization, and (d) a "no treatment" control. It was necessary to restrict the total N to 24 because of the time limitations of the physiological telemetry system used.

Instruments

The battery of scales administered to the Ss before and after treatment included the following: the S-R Inventory of Anxiousness (Endler, Hunt, and Rosenstein, 1962), a short form of the (PRCS) Personal Report of Confidence as a Speaker (Gilkenson, 1942) modified by Paul (1965), and the Public Speaking Anxiety Inventory adapted from the Test Anxiety Inventory (Thoresen, 1966) (see appendix). The Myers-Brigg personality type indicator (Myers, 1962) was used to determine introvert-extrovert personality modalities.

Pre and Post Stress-Condition Measures

The measures of anxiety and physiological arousal taken immediately after each test speech were the Thayer Adjective Check List (Thayer, 1966), an Anxiety Rating Sheet, Heart Rate Recording (Laemmle and Thoresen, 1967), and a Behavioral Check List for Performance Anxiety (Paul, 1966) (see appendix).

Procedure

The basic plan of the study is presented in Figure 1. Following the administration of the questionnaire and the selection of subjects, each subject was contacted individually and scheduled for the Pretreatment Test Speech. The pretreatment speeches were conducted in groups of sixteen composed of eight Ss, five observers, and three technicians. The pretreatment speeches were held on three consecutive nights the week before the beginning of treatment. No more than two subjects from the same class section were assigned to the same test group, so that each speaker's presentation was made before an unfamiliar audience. All test speeches were conducted in a large lecture hall in the Natural Science building. The room contained a stage where the speeches were given and an inclined audience section that seated 150 people. Fifteen to twenty persons heard each speech (including raters).

For each test group, speaker order was randomly assigned and written on the blackboard. Seating was

	Groups	Interview	Selection	Interview	Pre-Test Battery	Treatment	Post-Test Battery
1.	Systematic Desensitization (SD I) N-6	Explanatory letter and questionnaire	Random Selection based on anxiety level i.e., those who indicated extreme anxiety	Explanation of program and assignment to groups	PSAI PRCS S-R inventory Adj. Ck. list Rating sheet Heart rate Measurement Observer ratings Myers-Brigg	(SD)	Same as pre-test except no Myers-Brigg
2.	Systematic Desensitization (SD II) N-6					(SD)	
3.	In vivo Desensitization (IV) N-6					(IV)	
4.	No Treatment Control (NT) N-6					(NO)	

Figure 1.--Experimental design.

arranged to follow the order of presentation. The investigator explained that the purpose of the meeting was to determine each subject's reactions in a speaking situation. The procedure was explained, and the five observers were introduced as speech experts "who will be helping us evaluate your reactions." To equalize possible order-effects of anticipation, each subject was asked to complete a behavioral check list to keep him "busy" and to give the investigator information concerning inter-subject reliability in rating fellow students. Just before the subject's presentation, when the preceding speaker went on stage to give his speech, each subject went to a side room off to one side of the stage to be "fitted" for the physiological telemetry recording. One S was "fitted" while another gave his speech.

Heart Rate Recording Procedures

Before his speech, the subject was "hooked up" to a telemetry device that would broadcast his heart rate to a recording machine (located in the wings of the stage) without wires. Two disc electrodes were attached to the skin surface; one on the sternum and one on the left side between the sixth and seventh rib. The electrodes were attached to a small transistorized radio transmitter (about the size of a cigarette lighter) which was placed in the S's shirt pocket. The subject was continuously

monitored throughout his two to three minute speech. The radio transmitter sent heart rate signals to a off stage graphing device which charted the subject's heart rate (see Figure 2). After the speech the electrodes and transmitter were removed from the subject and made ready for the following subject.

Observer Ratings

During the presentations of the test speeches, each subject was scored on the Behavioral Check List for Performance Anxiety (see appendix). This instrument, developed by Paul (1966), lists twenty observable manifestations of anxiety, the presence or absence of which was recorded by five trained observers throughout the entire speech. Five doctoral students in speech pathology at Michigan State served as paid observers. All five observers were trained in the detection and recording of behaviors with student speakers so that all observers had a common definition of response. The total score, derived by pooling the total incidence of behavioral manifestations over all five observers, served as an objective indicant of anxiety. The average inter-observer reliability correlation coefficient exceeded .90 at the end of training.

Immediately following his speech, the subject completed the Thayer Adjective Check List and the Anxiety Rating Sheet. He also was given the S-R Inventory of Anxiousness, the Public Speaking Anxiety Inventory and

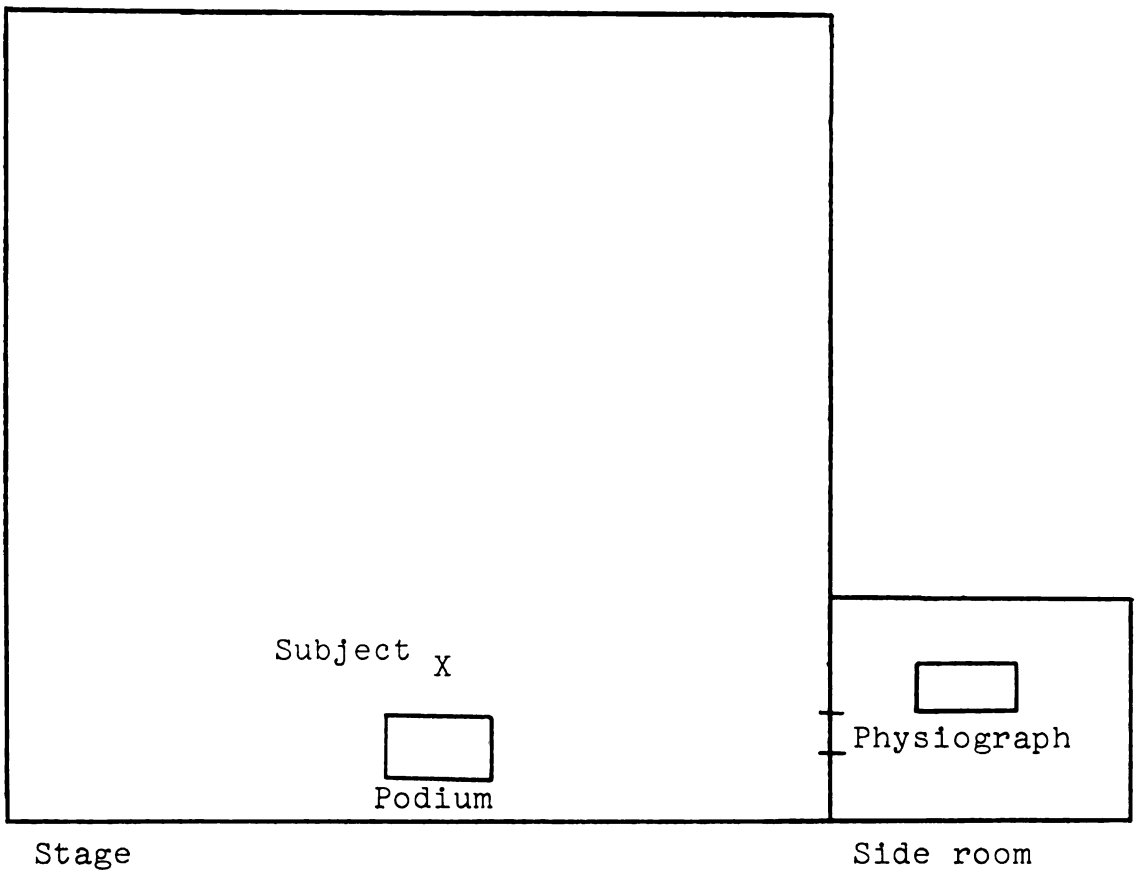

Figure 2.--Diagram of the pre- post-test speech situation.

the Personal Report of Confidence as a Speaker test, to complete and submit to the investigator as soon as he was finished. This procedure was followed for the post-test speech as well as the pre-test speech. The Myers-Brigg test was given only after the pre-test speech.

Treatment

Systematic Desensitization

This treatment consisted of a slightly modified form of Paul's treatment (1966) advanced by Wolpe (1958) and Wolpe and Lazarus (1966; see appendix for specific procedures). The systematic desensitization treatment was split into two treatment groups with the only difference being the use of two different therapists. The investigator served as one therapist and an advanced doctoral student in counseling served as the second therapist. Both therapists had intensive training in systematic desensitization therapy and had both worked previously with research projects utilizing systematic desensitization.

The first two-three minutes of each treatment session were spent adjusting the telemetry heart rate system to make sure that the graphing device was picking up a clear signal. Two surface electrodes were attached to the skin surface of the subject, one on the manubrium sterni and the other on the left side between the sixth and seventh

rib. The electrodes were attached to a transitorized transmitter which was placed in the subject's shirt pocket. The transmitter relayed a signal to a graphing recorder in an adjacent room (see Figure 3). There was a one-way mirror between the therapy room and the observation room which housed the recorder. While the subject was being monitored for heart rate he was also being observed and his responses were recorded simultaneously with his heart rate during all sessions. Two undergraduate psychology students served as the recorders. These students were trained before the treatment period so that they would know what responses to look for while each subject went through the desensitization procedure. The observers were asked to watch for behavioral and verbal responses and record them immediately on the heart rate graph paper.

During the first treatment hour, five-to-ten minutes were spent evaluating the situations that evoked anxiety in the subject (see appendix). Also during the first treatment hour five-to-ten minutes were spent explaining the rationale and the course of treatment. The rationale given was taken from Paul's work (1966, p. 177).

> Each subject was told that his emotional reactions were the result of previous experiences with persons and situations, and that these inappropriate emotional reactions could be unlearned by first determining the situations in which he becomes progressively more anxious, building a hierarchy from the least to the most anxious situations associated with giving a speech, and then repeatedly

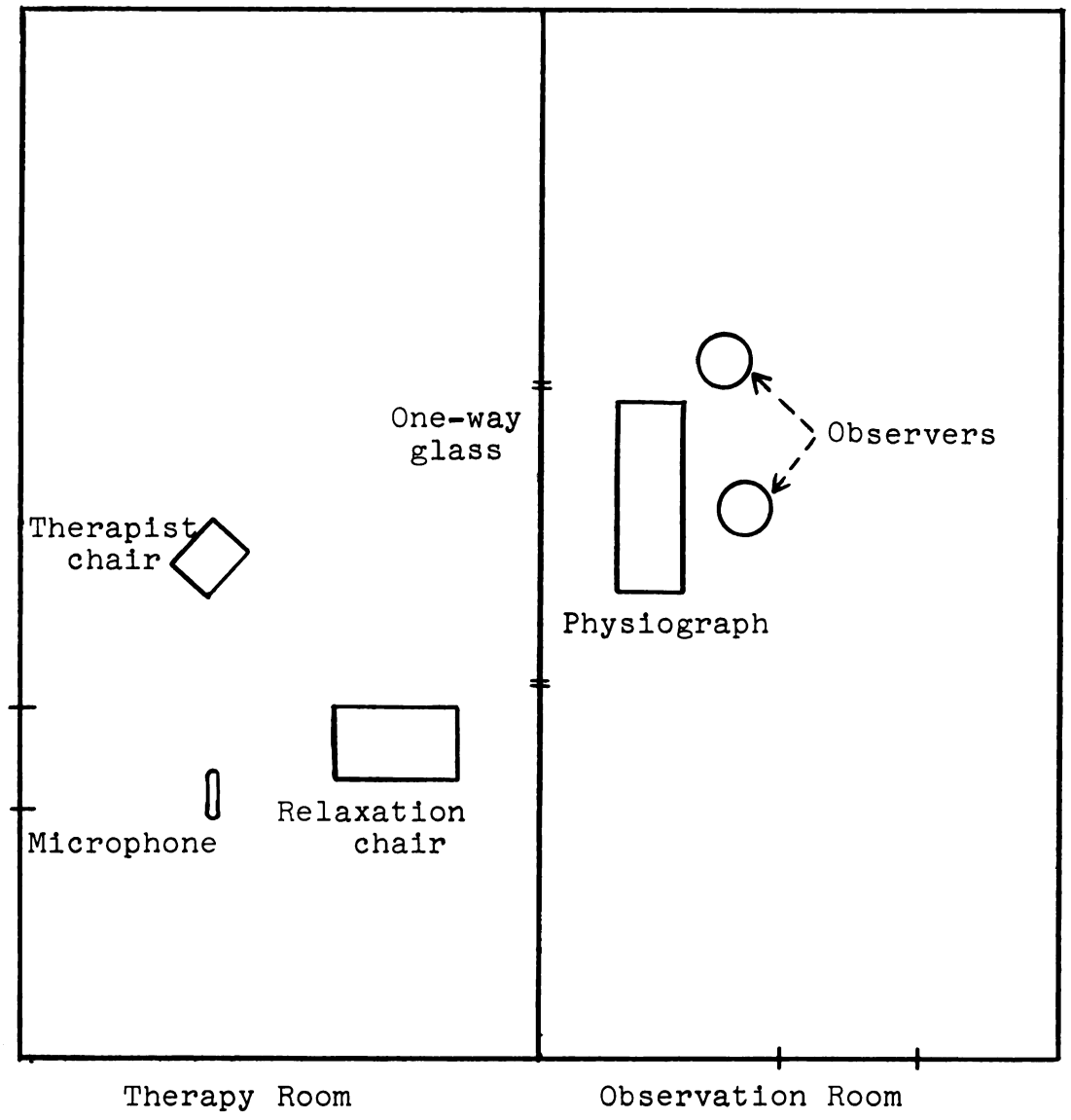

Figure 3.--Diagram of therapy and observation room.

> visualizing these situations while deeply relaxed. The subject was also told that relaxation was beneficial because the muscle systems of the body could not be both tense and relaxed at the same time, and that by proceeding gradually up the hierarchy, the previous anxiety-provoking situations would become associated with relaxation, thus desensitizing the anxiety.

The following five minutes of the first session were spent assessing the subject's visual imagery ability. Each subject was asked to imagine himself in his room and to tell the investigator what he saw, felt, heard, and smelled. A visual imagery scale was used to evaluate how well the subject could feel the situation (see appendix).

After the subject's visual imagery ability was assessed, the subject was asked to image the most anxiety provoking speech situation. Heart rate recordings were made during the imagery and compared against recordings made at the end of treatment (see appendix).

The next ten-fifteen minutes of the first session were spent constructing an anxiety hierarchy using Paul's speech hierarchy as a guide (1966; see appendix). The situations on the hierarchy were related to public speaking performance, beginning with those that were found to arouse very slight controllable amounts of anxiety and working up to those that were found to cause extreme anxiety. The steps were carefully graded for minor increases in disturbance. The actual hierarchies contained ten-fifteen items, with some items from the basic

hierarchy either dropped or subdivided to meet the needs of the individual subjects (see appendix).

During the last twenty-thirty minutes of the first session, the subject received training in progressive relaxation. This procedure, which is a modified form of Jacobson's (1938), consists of alternately tensing and releasing gross-muscle groups and learning to focus attention on these muscles, moving progressively through the body and extremities until a state of deep relaxation is achieved. The subjects were told to practice the relaxation procedure between sessions, twice a day for no longer than fifteen minutes. It was suggested that they practice around noon and before going to bed at night (see appendix).

The second through the fifth sessions were conducted in the following manner. The first two-three minutes were spent checking the telemetry equipment. The next three-four minutes were spent checking on the success of relaxation practice and correcting any problems with the procedure. Following these procedures, relaxation was induced. A standardized relaxation tape was used for both systematic desensitization treatments. The process took fifteen to thirty minutes depending upon the subject. After relaxation, imagery was tested, then items from the anxiety hierarchy were visualized according to the pre-determined procedure of presentation (see

appendix), starting with the least disturbing items from the hierarchy and working up to the most distressing. Two to six items were presented in a single session; each item was presented two to five items for a period of three to thirty seconds. At the end of the session a few minutes were spent with the subject in evaluating his relaxation state (see appendix). Each treatment session was approximately sixty minutes in duration.

In Vivo Desensitization

Subjects receiving in vivo desensitization were seen for only one session. During that session the first few minutes were spent checking the telemetry equipment. The following five to ten minutes were spent explaining the rationale for treatment and the nature of the program. They were told that their emotional reactions were the result of previous experiences with persons and situations and that these inappropriate emotional reactions could be unlearned by utilizing a relaxation technique just before and during a stressful situation. The subject was told that relaxation was beneficial because the muscle systems of the body could not be both tense and relaxed at the same time, so by coupling relaxation with the anxiety provoking situation the situation would become associated with relaxation, thus desensitizing the anxiety. The next ten to fifteen minutes of the session was spent in formal relaxation training using a muscle relaxation tape

recording. After the session each subject was asked to practice the relaxation technique twice a day, no longer than fifteen minutes each time. It was also explained that he would now be on his own to practice relaxation and to use it preceding and during public speaking situations. Each subject was told that he would be seen at the end of the quarter to evaluate his progress in reducing his anxiety.

No Treatment Control Group

The no treatment control group was not contacted while the other treatment groups were receiving formal treatment. However, they were contacted at the end of the program for the post-test speech and evaluation.

Definition of Terms Used in Hypotheses

In order to insure complete understanding of the operational hypotheses and to delimit their meaning the following definitions are used.

Operational Hypotheses

Hypothesis I: Subject's physiological anxiety arousal level in a real situation will be greater than the visual imagery anxiety arousal.

Hypothesis II: Systematic desensitization will be more effective in reducing anxiety than *in vivo* desensitization.

Hypothesis III: Systematic desensitization will be more effective in reducing anxiety than "no treatment."

Hypothesis IV: In vivo desensitization will be more effective in reducing anxiety than "no treatment."

Hypothesis V: There will be a positive correlation between tests of self report and heart rate.

Hypothesis VI: There will be a positive correlation between tests of self report and observer ratings.

Hypothesis VII: Heart rate during the relaxation procedure of systematic desensitization will be lower during the fifth therapy session than the first.

In Hypothesis I, "subject's physiological anxiety arousal level in a real situation" refers to the heart rate measurement taken while the subject gives a speech, both in the pre- and post-test speech situation. "Will be greater than" means a faster heart rate. "Visual imagery arousal" indicates the arousal level determined before and after treatment. "Visual imagery" also refers to fantasizing a public speaking situation.

In Hypotheses II, III, and IV "Will be more effective in reducing anxiety" refers to the change scores of the pre- and post-treatment measures of anxiety.

Procedures for Analysis of the Data

To determine the differences among the various measures of anxiety throughout the program, a multiple correlational statistical program was selected.

A one-way analysis of variance using pre-post change scores was utilized to measure the differences between the effectiveness of the various treatments in reducing anxiety in subjects.

The CDC 3600 computer at Michigan State University was used to analyze the data. Program type 101, version 1.107 was used for both analyses.

CHAPTER IV

RESULTS

Paul found in his research with public speaking anxious students that the analysis of change scores from pre-treatment to post-treatment stress-condition measures provided the most stringest test of treatment effects (1965, p. 31). In the present study, these measures were not only more objective, but they were taken in a situation in which the target behaviors (cognitive, physiological, and motoric) were most likely to occur. Furthermore, the great majority of subjects reported the test speeches to be even more stressful than others because they were given before an unfamiliar audience and evaluated by speech experts.

Stress Condition Measures: Test Speeches

Pre-post change scores for each of the stress-conditions was subjected to a one-way analysis of variance against treatments for all Ss. The analysis of variance results indicated highly significant differences between groups based on the pre-post change scores of the following measures: (a) Personal Report of Confidence as

a Speaker (PRCS), (b) Public Speaking Anxiety Inventory (PSAI), S-R Inventory of Anxiousness-Public Speaking Section (S-R SP), and Heart Rate (HR).

Since pre-treatment to post-treatment changes between groups were of important interest to this study, a finer analysis was carried out on change scores for each measure: one-tailed t and t' (t' used for unequal variances) tests of significance were used to determine the significance of differences in pre-post changes between groups (Guilford, 1956).

T tests were determined only on significant F measures. Guilford mentioned that

> . . . a significant F tells us that there are nonchance variations among means somewhere in the list of sets; we do not know how many or which ones are significantly different. As a group they could not have arisen from a homogeneous list of samples. Further examination would be needed to tell us where the significant differences are and what sources in the form of experimental variation have probably determined them.

Guilford goes on to say that a t test would be the appropriate statistic to follow the F statistic for the finer discrimination (Guilford, 1956, p. 263).

Procedure for Statistical Analysis

The systematic desensitization treatment was split into two groups, one group for each therapist. This was done to provide equal N's (six in each group) for the statistical analysis and to provide a method to investigate therapist differences. Results indicated that there

were no significant differences between therapists using the stress measures change scores as a criterion (see Tables 1-12).

In addition to the one-way analysis of variance, simple correlations were computed for all stress measures (see appendix).

Hypothesis Testing

Physiological Anxiety Arousal

The hypothesis that S's physiological anxiety arousal level in a real situation would be greater than the visual imagery anxiety arousal was strongly supported. It was found that a significant difference existed in the direction of the hypothesis between the pre-treatment visual imagery physiological anxiety arousal of a public speaking situation and the physiological anxiety arousal of the pre-treatment test speech. Also, there was a significant difference between the post-treatment visual imagery arousal and the post-treatment test speech arousal (see Tables 13, 14, 15 and 16).

Effectiveness of Treatments in Anxiety Reduction: Systematic Desensitization vs. In Vivo Desensitization

The hypothesis that systematic desensitization would be more effective in reducing anxiety than in vivo desensitization was strongly supported using the self-report and heart rate criteria measures. There were

TABLE 1.--Heart rate statistics for treatments: systematic desensitization group I (SD I), systematic desensitization group II (SD II), *in vivo* desensitization group (*in vivo*), and no treatment control group (No Tr.).

Group	Sum	Freq.	Mean	Mean Increment	Sum of Squares	S.D.	Sum of Squared Deviations From the Means
SD I	-100.00	6	-16.67	-9.33	3092	16.88	1425.33
SD II	-114.00	6	-19.00	-11.67	4380	21.04	2214.00
In vivo	75.00	6	12.50	19.83	2455	17.42	1517.50
No. Tr.	-37.00	6	-6.16	1.16	1851	18.01	1622.83

TABLE 2.--Analysis of variance table for heart rate measures.

Source of Variance	Sum of Squares	Degrees of Freedom	Mean Square	F Statistic	Significance Level
Between Categories	3707.67	3	1235.89	3.64	.03
Within Categories	6779.66	20	338.98		
Total	10487.33	23			

TABLE 3.--Results of t test difference between mean heart rate change scores for systematic desensitization group I (SD I) and systematic desensitization group II (SD II).

Group	N	Mean	S.D.	t	df	p
SD I	6	16.67	16.88	.21	10	.30
SD II	6	19.00	21.04			

TABLE 4.--Personal report of confidence as a speaker statistics for treatments: systematic desensitization group I (SD I), systematic desensitization group II (SD II), *in vivo* desensitization group (*In Vivo*), and no treatment control group (No Tr.).

Group	Sum	Freq.	Mean	Mean Increment	Sum of Squares	S.D.	Sum of Squared Deviations From the Means
SD I	-79.00	6	-13.16	-7.25	1465.00	9.21	424.83
SD II	-42.00	6	- 7.00	-1.08	418.00	4.97	124.00
In Vivo	-21.00	6	- 3.50	2.41	118.00	4.92	121.50
No Tr.	0.00	6	0.00	5.91	195.00	4.85	118.00

TABLE 5.--Analysis of variance table for the Personal Report of Confidence as a Speaker (PRCS).

Source of Variance	Sum of Squares	Degrees of Freedom	Mean Square	F Statistic	Significance Level
Between Categories	567.50	3	189.16	4.79	.01
Within Categories	788.33	20	39.41		
Total	1355.83	23			

TABLE 6.--Results of t test difference between mean change scores on the Personal Report of Confidence as a Speaker for systematic desensitization group I (SD I) and systematic desensitization group II (SD II).

Group	N	Mean	S.D.	t	df	p
SD I	6	13.16	9.21	1.44	10	.20
SD II	6	7.00	4.97			

TABLE 7.--Public Speaking Anxiety Inventory statistics for treatments: systematic desensitization group I (SD I), systematic desensitization group II (SD II), *in vivo* desensitization group (*In Vivo*), and no treatment control group (No Tr.).

Group	Sum	Freq.	Mean	Mean Increment	Sum of Squares	S.D.	Sum of Squared Deviations From the Means
SD I	-246.00	6	-41.00	-21.91	14206	28.70	4120.00
SD II	-161.00	6	-26.83	- 7.75	6367	20.23	2046.83
In Vivo	-35.00	6	- 5.83	13.25	619	9.10	414.83
No Tr.	-16.00	6	- 2.66	16.41	3148	24.92	3105.33

TABLE 8.--Analysis of variance table for the Public Speaking Anxiety Inventory (PSAI).

Source of Variance	Sum of Squares	Degrees of Freedom	Mean Square	F Statistic	Significance Level
Between Categories	5912.83	3	1970.94	4.06	.02
Within Categories	9687.00	20	484.35		
Total	15599.83	23			

TABLE 9.--Results of t test difference between mean change scores on the Public Speaking Anxiety Inventory for systematic desensitization group I (SD I) and systematic desensitization group II (SD II).

Group	N	Mean	S.D.	t	df	p
SD I	6	41.00	28.70	.991	10	.30
SD II	6	26.83	20.23			

TABLE 10.--S-R Inventory of Anxiousness, speech section statistics for treatments: systematic desensitization group I (SD I), systematic desensitization group II (SD II), *in vivo* desensitization group (*In Vivo*), and no treatment control group (No Tr.).

Group	Sum	Freq.	Mean	Mean Increment	Sum of Squares	S.D.	Sum of Squared Deviations From the Means
SD I	-96.00	6	-16.00	-8.66	2070	10.33	534.00
SD II	-67.00	6	-11.16	-3.83	1385	11.28	636.83
In Vivo	24.00	6	4.00	11.33	940	12.99	844.00
No Tr.	-37.00	6	-6.16	1.16	375	5.41	146.83

TABLE 11.--Analysis of variance table for the S-R Inventory of Anxiousness, speech section (SR-SP).

Source of Variance	Sum of Squares	Degrees of Freedom	Mean Square	F Statistic	Significance Level
Between Categories	1317.66	3	439.22	4.06	.02
Within Categories	2161.66	20	108.08		
Total	3479.33	23			

TABLE 12.--Results of t test difference between mean change scores on the SR Inventory of Anxiousness, speech section for systematic desensitization group I (SD I) and systematic desensitization group II (SD II).

Group	N	Mean	S.D.	t	df	p
SD I	6	16.00	10.33	.78	10	.40
SD II	6	11.17	11.28			

TABLE 13.--Results of t test difference between pre-treatment mean heart rate in the "real" situation and pre-treatment mean heart rate during visual imagery (VI HR) for systematic desensitization group I.

Group	N	Mean	S.D.	t	df	p
"Real" HR	6	128.0	20.66	2.36	10	.025
VI HR	6	95.0	15.68			

TABLE 14.--Results of t test difference between pre-treatment mean heart rate in the "real" situation ("real HR) and pre-treatment mean heart rate during visual imagery (VI HR) for systematic desensitization group II.

Group	N	Mean	S.D.	t	df	p
"Real" HR	6	137.5	13.34	6.10	10	.0005
VI HR	6	86.3	4.15			

TABLE 15.--Results of t test difference between post-treatment mean heart rate in the "real" situation ("real" HR) and post-treatment mean heart rate during visual imagery (VI HR) for systematic desensitization group I.

Group	N	Mean	S.D.	t	df	p
"Real" HR	6	111.33	20.51	2.87	10	.01
VI HR	6	78.50	19.22			

TABLE 16.--Results of t test difference between post-treatment mean heart rate in the "real" situation and post-treatment mean heart rate during visual imagery (VI HR) for systematic desensitization group II.

Group	N	Mean	S.D.	t	df	p
"Real" HR	6	118.5	20.24	5.15	10	.0005
VI HR	6	72.0	9.03			

significant differences in the direction of the hypothesis of the three highly correlated self-report tests of anxiety. On the PRCS, the SD I group scores changed significantly over the in vivo treatment (see Table 17).

TABLE 17.--Results of t' test of difference between mean change scores on the Personal Report of Confidence as a Speaker (PRCS) for systematic desensitization group I (SD I) and in vivo treatment.[1]

Group	N	Mean	S.D.	t	df	p
SD I	6	13.16	9.21	2.27	8.7	.03
In Vivo	6	3.50	4.93			

[1]See Tables 4 and 5 for analysis of variance results.

Systematic Desensitization Group II was not significantly better than the In Vivo Group although the change scores were in the direction of the hypothesis (see Table 18).

TABLE 18.--Results of t test of difference between mean change scores on the Personal Report of Confidence as a Speaker for systematic desensitization group II (SD II) and *in vivo* treatment.[1]

Group	N	Mean	S.D.	t	df	p
SD II	6	7.00	4.98	1.22	10	.10
In Vivo	6	3.50	4.93			

[1]See Tables 4 and 5 for analysis of variance results.

On the Public Speaking Anxiety Inventory, systematic desensitization group I was more effective than *in vivo* (see Table 19).

TABLE 19.--Results of t' test of difference between mean change scores on the Public Speaking Anxiety Inventory for systematic desensitization group I (SD I and *in vivo* treatment.[1]

Group	N	Mean	S.D.	t	df	p
SD I	6	41.00	28.70	2.85	6.3	.02
In Vivo	6	5.83	9.10			

[1]See Tables 7 and 8 for analysis of variance results.

Also systematic desensitization group II was more effective than *in vivo* (see Table 20).

TABLE 20.--Results of t' test of difference between mean change scores on the Public Speaking Anxiety Inventory for systematic desensitization group II (SD II) and *in vivo* treatment.[1]

Group	N	Mean	S.D.	t	df	p
SD II	6	26.83	20.23	2.31	7.7	.03
In Vivo	6	5.83	9.10			

[1]See Tables 7 and 8 for analysis of variance results.

On the S-R Inventory of Anxiousness, speech section, systematic desensitization group I was more effective than *in vivo* treatment (see Table 21).

TABLE 21.--Results of t test of difference between mean change scores on the S-R Inventory of Anxiousness, speech section for systematic desensitization group I (SD I) and *in vivo* treatment.[1]

Group	N	Mean	S.D.	t	df	p
SD I	6	16.00	10.33	2.96	10	.008
In Vivo	6	4.00	12.99			

[1]See Tables 10 and 11 for analysis of variance results.

Also systematic desensitization group II was more effective than *in vivo* treatment (see Table 22).

TABLE 22.--Results of t test difference between mean change scores on the S-R Inventory of Anxiousness, speech section for systematic desensitization group II (SD II) and *in vivo* treatment.[1]

Group	N	Mean	S.D.	t	df	p
SD II	6	11.16	11.28	2.16	10	.03
In Vivo	6	4.00	12.99			

[1]See Tables 10 and 11 for analysis of variance results.

For the HR change scores, systematic desensitization group I was more effective in reducing anxiety than *in vivo* treatment (see Table 23).

TABLE 23.--Results of t test difference between mean change scores of Heart Rate for systematic desensitization group I (SD I) and *in vivo* treatment.[1]

Group	N	Mean	S.D.	t	df	p
SD I	6	16.67	16.88	2.95	10	.007
In Vivo	6	12.50	17.42			

[1]See Tables 1 and 2 for analysis of variance results.

Systematic desensitization group II was also more effective than *in vivo* in reducing anxiety using Heart Rate criterion (see Table 24).

TABLE 24.--Results of t test difference between mean change scores of Heart Rate for systematic desensitization group II (SD II) and *in vivo* treatment.[1]

Group	N	Mean	S.D.	t	df	p
SD II	6	19.00	21.04	2.83	10	.01
In Vivo	6	12.50	17.42			

[1]See Tables 1 and 2 for analysis of variance results.

Systematic Desensitization vs. "No Treatment" Control

The hypothesis which stated that systematic desensitization would be more effective in reducing anxiety than "no treatment" was strongly supported by the self-report measures, but not by Heart Rate measures. Systematic desensitization group I showed a significant difference over the "no treatment" control group with the following highly correlated criteria measures: Personal Report of Confidence as a Speaker, Public Speaking Anxiety Inventory, and the S-R Inventory of Anxiousness, Speech Section (see Tables 25, 26, and 27).

TABLE 25.--Results of t' test difference between mean change scores on the Personal Report of Confidence as a Speaker for systematic desensitization group I (SD I) and "no treatment" control group.[1]

Group	N	Mean	S.D.	t	df	p
SD I	6	13.16	9.21	3.11	8.6	.008
"No Tr."	6	0.0	4.85			

[1]See Tables 4 and 5 for analysis of variance results.

TABLE 26.--Results of t test difference between mean change scores on the Public Speaking Anxiety Inventory for systematic desensitization group I (SD I) and "no treatment" control group.[1]

Group	N	Mean	S.D.	t	df	p
SD I	6	41.00	28.70	2.48	10	.02
"No Tr."	6	2.66	24.92			

[1]See Tables 7 and 8 for analysis of variance results.

TABLE 27.--Results of t' test difference between mean change scores on the S-R Inventory of Anxiousness, speech section for systematic desensitization group I (SD I) and "no treatment" control group.[1]

Group	N	Mean	S.D.	t	df	p
SD I	6	16.00	10.33	2.07	8.6	.04
"No Tr."	6	6.16	5.41			

[1]See Tables 10 and 11 for analysis of variance results.

Systematic desensitization group II was significantly more effective than "no treatment" control in reducing anxiety on the Personal Report of Confidence as a Speaker and the Public Speaking Anxiety Inventory, however, there was no significance on the S-R Inventory of Anxiousness, speech section measure (see Tables 28, 29 and 39).

TABLE 28.--Results of t test difference between mean change scores on the Personal Report of Confidence as a Speaker for systematic desensitization group II (SD II) and "no treatment" control group.[1]

Group	N	Mean	S.D.	t	df	p
SD II	6	7.00	4.98	2.18	10	.03
"No Tr."	6	0.0	4.85			

[1]See Tables 4 and 5 for analysis of variance results.

TABLE 29.--Results of t test difference between mean change scores on the Public Speaking Anxiety Inventory for systematic desensitization group II (SD II) and "no treatment" control group.[1]

Group	N	Mean	S.D.	t	df	p
SD II	6	26.83	20.23	1.85	10	.05
"No Tr."	6	2.66	24.92			

[1]See Tables 7 and 8 for analysis of variance results.

TABLE 30.--Results of t test difference between mean change scores on the S-R Inventory of Anxiousness, speech section for systematic desensitization group II (SD II) and "no treatment" control group.[1]

Group	N	Mean	S.D.	t	df	p
SD II	6	11.16	11.28	.99	10	.30
"No Tr."	6	6.16	5.41			

[1]See Tables 10 and 11 for analysis of variance results.

In Vivo vs. "No Treatment"

The hypothesis that in vivo desensitization would be more effective in reducing anxiety than "no treatment" was not supported by the self-report measures of anxiety but was supported by the heart rate measure of anxiety. The Heart Rate change scores indicated that in vivo was significantly more effective in reducing anxiety than "no treatment" control (see Table 31).

TABLE 31.--Results of t test difference between mean change scores of Heart Rate for in vivo treatment and "no treatment" (NT) control group.[1]

Group	N	Mean	S.D.	t	df	p
In Vivo	6	12.50	17.42	1.82	10	.05
NT	6	6.16	18.01			

[1]See Tables 1 and 2 for analysis of variance results.

Correlations Among Anxiety Measures Self-Report vs. Heart Rate

The hypothesis that self-report measures of anxiety would show a positive correlation with Heart Rate measures was not supported (see Table 32).

Self-Report vs. Observer Ratings

The hypothesis that self-report measures of anxiety would show a positive correlation with observer ratings was not supported. The correlations between observer

TABLE 32.--Simple correlations of self-report measures of anxiety and Heart Rate (correlations not significant at .01 level of confidence).

Heart Rate	Personal Report of Confidence as a Speaker	Public Speaking Anxiety Inventory	S-R Inventory of Anxiousness, Speech Section
--	.42	.49	.36

TABLE 33.--Simple correlations of self-report measures of anxiety and observer ratings of anxiety.

	Personal Report of Confidence as a Speaker	Public Speaking Anxiety Inventory	S-R Inventory of Anxiousness, Total Score	S-R Inventory of Anxiousness, Speech Section	Self Rate	Adjective Check List
Observer Ratings	-.30	-.15	-.13	-.15	.04	-.006

ratings and self-report measures were low and not significant at the .01 level (see Table 33).

Relaxation Over Treatment

The hypothesis that Heart Rate, during relaxation in treatment, would decrease over treatments was not supported. T test differences between Heart Rate during relaxation of session 1 and Heart Rate of session 5 revealed no significant differences (see Table 34).

TABLE 34.--Results of t test difference between mean scores of Heart Rate of systematic desensitization groups I and II for treatment session #1 and treatment session #5.

Group	N	Mean	S.D.	t	df	p
Session #1	12	74.5	11.43	.75	22	.40
Session #5	12	75.5	12.92			

Other Findings

Although no significant difference was found between real life anxiety and visual imagery anxiety comparing pre- and post-test scores, it was found that both seemed to decrease at a similar rate across the five treatments. By using a Spearman Rank-Order correlation, it was found that there was a strong positive relationship (r. 85) (at .02 level of significance) across all Ss between the ratios of pre- to post-treatment scores for Heart Rate

in the real situation and pre- to post-treatment scores of Heart Rate during visual imagery.

CHAPTER V

DISCUSSION

This study showed that systematic desensitization and *in vivo* desensitization therapy were effective in decreasing public speaking anxiety with male college students. Results also indicated a strong relationship between the anxiety experienced while *Ss* were speaking in public and the anxiety they experienced thinking or fantasizing about speaking. In addition, the results indicated discrepancies among the various tests of anxiety arousal.

Summary of Hypothesis Testing

The prediction that systematic desensitization would be more effective in reducing public speaking anxiety than *in vivo* desensitization and "no treatment" was firmly supported. These predictions which were stated in hypothesis II and III found significant support.

Hypothesis IV predicted that *in vivo* desensitization would be more effective than "no treatment" in reducing public speaking anxiety. The heart rate measures supported this hypothesis but the self-report and motoric measures *did not*.

Hypothesis I, which predicted greater physiological arousal in a real situation than arousal during visual imagery, found a significant difference in the direction of the hypothesis.

The prediction that high correlations among various measures of anxiety would be found, as stated in hypotheses V and VI, was not supported. The prediction that all Ss going through SD treatment would become more relaxed throughout sessions was not supported (hypothesis VII).

General Findings

Effects of Treatment

Results of this study support several of the theoretical positions on which the research was based. One such position was that of Wolpe who found that *in vivo* desensitization was impractical because the anxiety stimuli could not be controlled and because of the assiduous training that would be required to couple the real situational anxiety with relaxation training (Wolpe, 1966, p. 58). The results indicating that systematic desensitization reduces public speaking anxiety significantly more than *in vivo* desensitization also supports Wolpe. In examining the work of Cook and Zeisset, it seems that they had more control over their subjects and the Ss environment than did the present study. This may account

for the discrepancy in the results of this study and the research of Cook and Zeisset. In the present study the Ss were not closely monitored to make sure that they were practicing relaxation techniques before and during their speeches. The lack of control over the in vivo subjects might have contributed to the difference found between in vivo and SD. Also it was found that in vivo desensitization proved to be more effective in reducing anxiety compared to the "no treatment" group using heart rate scores. These results do not correspond to the results of Zeisset (1966) and Cook (1966) who found no significant differences between the SD and in vivo groups.

Visual Imagery

Because visual imagery plays such an important part in systematic desensitization it was decided to compare and study the relationship between visual imagery arousal and the real situational anxiety arousal. A significant difference was found between real situational anxiety and visual imagery anxiety, as measured by heart rate. The environmental anxiety was significantly higher than visual imagery anxiety. One possible explanation for these results is that Ss in the therapist's office find it very difficult to actually "feel" themselves in the anxiety producing situation. They were in a "safe" one-to-one relationship and the visually imagined situation might not have been as threatening.

Wolpin (1966) and Lazarus (1963b) found that introverts gain more from systematic desensitization than extroverts. They hypothesized that this may be due to introverts having more "fantasy practice" than extroverts. In the present study the relationship of environmental and imagery anxiety was investigated according to introvert-extrovert modalities as measured by the Myers-Briggs Personality Indicator. In looking over the data, it was found that introverts tended to have a higher relationship of environmental and imagery anxiety than extroverts. This finding would tend to reinforce the theory of Wolpin that introverts are able to experience anxious feelings through imagery better than extroverts. This aspect of the study will be evaluated at a later time.

"Shadow Effect"

Although the amount of visual imagery anxiety did not equal the amount of environmental anxiety, there was a strong "shadow effect" between the two gain scores. As the heart rate decreased from pre- to post-test in the real situation, so did heart rate decrease through visual imagery. Consequently, there seems to be a proportionate relationship between the two. These results reinforce the importance of visual imagery ability in systematic desensitization. There seems to be a generalization effect from visual imagery arousal to situational anxiety.

Relaxation Throughout Sessions

There was no significant difference found between the depth of relaxation (as measured by heart rate) during the first treatment session and the final treatment session. One explanation for this phenomenon is that the Ss were able to become completely relaxed during the first session and that not much change actually occurred over time. Several Ss fell asleep for a few seconds toward the end of the first session. This would provide a good indication of complete relaxation. Another explanation could be that heart rate measures do not detect minute changes in muscle tone. Electro-myograph recordings would be a better indicator of relative muscular relaxation.

Anxiety Measurement

Because of the discrepancies observed in this study among the physiological, motoric, and self-report indices of anxiety, the obvious question arises: which index is the best indicator of anxiety? In the present study the motoric index was not correlated with the other indices and did not indicate significant changes from the pre- to post-test situations. This may be partially due to the small amount of time spent training observers. The interreliability of raters of the pre- and post-treatment speeches was low (.25).

There were three self-report scales out of the five administered that were highly correlated (see appendix). Even though these scales were highly correlated, they did not show a high relationship to the heart rate measure. Also the motoric measures did not correlate with heart rate measures. These results reinforce Thayer's findings (1966) which indicate poor relationships between self-report and physiological anxiety measures.

The question of social desirability has arisen in connection with self-report studies. Do Ss change because of the investigator's and subject's invested expectations or do they report change because they really notice a change in their behavior. In studies of anxiety reduction, self-report is probably the most important measure because the subjects may have learned to do one of two things with their anxiety: (a) they might have learned to cope with the anxiety and feel much better because they have the anxiety under control, or (b) they might have been able to reduce the anxiety and feel much better. If heart rate were used alone for anxiety measurement, the subjects who learn to cope would not show a significant improvement when in fact they may be "feeling" much improved.

It may be beneficial in the future to train Ss to respond verbally in terms of their own physiological responses. During the present study it was found that Ss tended to become much more aware of their physiological anxiety over time. Perhaps this phenomenon had a critical effect on the treatment. This aspect of systematic desensitization demand further research.

Physiological Assessment

This study gave support to the use of telemetry equipment in behavioral research. The equipment worked optimally throughout the research program and did not cause any problems. The Ss were very receptive to the equipment and it caused them no discomfort. All of the Ss stated that they forgot about the equipment a few minutes after they were "hooked up." The transistorized telemetry equipment seems to decrease the "laboratory effect" of physiological measurement significantly.

Implications for Future Research

Because of the facility in the use of physiological telemetry equipment, subjects could be monitored in a wide variety of environmental situations to study behavioral changes. Since this study was initiated, a major instrument company has come out with a galvanic skin resistance telemetry device. Now GSR, EKG, EMG, EEG, and respiration can be monitored via telemetry and multiple channels can be utilized for each subject.

The possibilities for the use of telemetry equipment in behavioral research are numerous.

Since systematic desensitization has proven to be so effective in reducing anxiety, it would be interesting to investigate the three main facets of SD: (a) hierarchy building, (b) relaxation training, and (c) the coupling of the anxiety stimuli and relaxation. Some questions which might arise out of these investigations are these: Is there any difference between a standard hierarchy and the individual hierarchy in anxiety reduction? Are there any other forms of relaxation which are as effective as progressive muscular relaxation? Which is more important to systematic desensitization, hierarchy building or the relaxation training? Can the differences be measured?

CHAPTER VI

SUMMARY

Twenty-four male students who experienced extreme anxiety while giving a speech were selected from a population of 450 male students enrolled in Speech 101 at Michigan State University to participate in this study. These students were randomly assigned to four groups to help them reduce their public speaking anxiety. There were three treatment groups and one "no treatment" control group. The three treatment groups were: (a) two systematic desensitization therapy groups, and (b) one *in vivo* desensitization group.

The purposes of this investigation were as follows: (a) to determine the effectiveness of systematic desensitization and *in vivo* desensitization in reducing public speaking anxiety, (b) to investigate the differences between visual imagery anxiety and situational anxiety of those *Ss* receiving systematic desensitization treatment, and (c) to investigate the relationships among three types of anxiety measurement: heart rate measures, motoric measures, and self-report measures.

A transistorized bio-telemetry recording system was used to record heart rate of all subjects throughout

the research program. Subjects were physiologically monitored while giving a speech before an audience of students and speech experts before and after the formal treatment. Each subject also completed several self-report scales of anxiousness before and after treatment. In addition, all subjects were behavioraly rated by five trained speech experts while giving their speech. Each subject was used as his own control, and the change scores from pre-treatment to post-treatment measures were evaluated to detect differences among treatment groups. A one-way analysis of variance was used to determine the differences among groups using the change scores of the pre- and post-treatment measures.

Subjects receiving the systematic desensitization treatment were monitored physiologically during each treatment session. This was done in order to investigate the relationship of visual imagery during treatment and situational anxiety during speeches.

Results indicated that systematic desensitization was more effective in reducing public speaking anxiety than in vivo desensitization and "no treatment" control group. The criteria for success in this case was heart rate and three highly correlated self-report measures. In vivo desensitization proved to be more effective in reducing public speaking anxiety than "no treatment" using heart rate criteria only. Self report and motoric indices did not support the results.

There were significant differences found between situational anxiety arousal and visual imagery arousal, however, there was a positive relationship between the two. As the situational anxiety went down over treatment so did visual imagery anxiety. Introverts had a higher positive relationship of imagery to situational anxiety than did extroverts (as measured by the Myers-Briggs Personality Type Indicator).

Results also showed low correlations among the three measures of anxiety. The motoric measure was deemed unreliable because of low inter-rater reliability. Self-report and heart rate measures were not significantly correlated.

Implications for further research were proposed.

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APPENDICES

APPENDIX A

SYSTEMATIC DESENSITIZATION PROCEDURE

SYSTEMATIC DESENSITIZATION PROCEDURE

This treatment is basically the Systematic Desensitization Therapy of Wolpe, with several modifications developed by Paul directed toward reducing the number of sessions required for anxiety reduction. There are five major procedures involved in the use of this technique: (1) exploration of history and current status of symptoms; (2) explanation of rationale; (3) construction of anxiety hierarchy; (4) training in progressive relaxation; and (5) desensitization proper--working through the hierarchy under relaxation.

Since the "target behavior" (speech anxiety) was determined prior to the therapist's contact with the client, the focus on retraining began with the first session, with desensitization beginning in the second session.

The following time schedule was used for all subjects:
First session:

1. Adjustment of heart rate telemetry equipment (3 minutes).
2. Exploration of history and current status of symptoms (5-10 minutes).
3. Explanation of rationale and course of treatment (5-10 minutes).
4. Assessment of visual imagery ability (5 minutes).
5. Physiological recording of specific target anxiety with visual imagery (5 minutes).

6. Construction of anxiety hierarchy (10-15 minutes).
7. Training in progressive relaxation (20-30 minutes).

Second to fifth session:

1. Adjustment of heart rate telemetry equipment (3 minutes).
2. Assessment of success of relaxation practice and the correction of any problems with the procedure (3-5 minutes).
3. Relaxation was induced (10-15 minutes).
4. Visual imagery was tested (3-5 minutes).
5. Desensitization proper (30-40 minutes).
6. Evaluation of relaxation state (2-3 minutes).

Specific Procedures

Adjustment of Heart Rate Telemetry Equipment

As soon as the subject came into the treatment room surface electrodes were attached on the skin surface in the area of the manubrium sterni and on the left side of the chest between the sixth and seventh rib. The electrodes were wired to a transistorized transmitter which was placed in the subject's shirt pocket. The subject was asked to sit in a reclining chair and rest while his heart signals were calibrated on a physiograph in an adjacent observation room. As soon as a clear signal

was recorded the technician signaled the therapist to begin the session.

Exploration of History and Current Status of Symptoms

This phase of treatment served primarily as an "ice breaker" and as a period in which to establish rapport. Subjects were asked: (1) how long they have experienced public speaking anxiety, (2) to what degree has performance anxiety interferred with functioning, and (3) whether other social or evaluative situations also elicited anxiety. These questions were asked to further the therapist's understanding of the problem and to help him with the hierarchy building.

Explanation of Rationale and Course of Treatment

It was important that each subject understand and accept the treatment process. Both the theory and course of treatment were explained and repeated when questions arose. It was made clear that anxiety is a result of learning, and that the treatment is a learning process. The following explanation was given to all subjects.

> The emotional reactions that you experience are a result of your previous experiences with people and situations; these reactions oftentimes lead to feelings of anxiety or tenseness which are really inappropriate. Since perceptions of situations occur within ourselves, it is possible to work with your reactions right here in the office by having you image or visualize those situations.
>
> The specific technique we will be using is one called desensitization. This technique utilizes two main procedures--relaxation and counterconditioning--to reduce your anxiety. The relaxation

procedure is based upon years of work that was started in the 1930's by Dr. Jacobsen. Dr. Jacobsen developed a method of inducing relaxation that can be learned very quickly, and which will allow you to become more deeply relaxed than ever before. Of course, the real advantage of relaxation is that the muscle systems in your body cannot be both tense and relaxed at the same time; therefore, once you have learned the relaxation technique, it can be used to counter anxiety, tenseness, and feelings like those you experience in the speech situations.

Relaxation alone can be used to reduce anxiety and tension, and I'll be asking you to practice relaxation between our meetings. Often, however, relaxation is inconvenient to use, and really doesn't permanently overcome anxiety. Therefore, we combine the relaxation technique with the psychological principle of counter-conditioning to actually desensitize situations so that anxiety no longer occurs.

The way in which we will do this is to determine the situations in which you become progressively more anxious, building a hierarchy from the least to the most anxious situations with regard to giving a speech. Then I will teach you the technique of progressive relaxation, and have you practice this. You will see how this operates in a few minutes when we actually start training. After you are more relaxed than ever before, we will then start counterconditioning. This will be done by having you repeatedly image the specific situations from the anxiety hierarchy while under relaxation. By having you visualize very briefly, while you are deeply relaxed, the situations that normally arouse anxiety, those situations gradually become desensitized, so that they no longer make you anxious. We start with those situations that bother you the least, and gradually work up to the speech itself. Since each visualization will lower your anxiety to the next, a full-fledged anxiety reaction never occurs.

We've used these procedures on several different types of clinical problems, including students with performance anxiety, with excellent results. Most of these procedures will become clearer after we get into them. Do you have any questions before we continue?

Assessment of Visual Imagery Ability

The following instructions were given to the subjects to examine their visual imagery ability:

> I want you to sit back and relax, you may keep your eyes open or close them, whichever feels most comfortable. Now I want you to imagine very vividly that you are in your room, sitting on the edge of your bed. Now I would like for you to describe to me in minute detail what you see directly in front of you (pause). OK, now I want you to tell me what you see directly to your left, (pause) to your right (pause). Do you see any books in your room? (if no books, any other objects will suffice). What color are the books? Can you read the titles? Now I want you to tell me what sounds you hear in the room, listen very carefully and describe the faintest sounds (pause). OK, now I want you to describe what you smell in the room (pause). Does the room seem warm or cold to you? (pause) Can you taste anything? (pause) How are you feeling now physically?
>
> Now as you're imagining this situation I want you to evaluate the quality of the experience. Do you feel:
>
> _____1. That you can't imagine the situation.
> _____2. That you can visualize the situation as an observer but you are not actually "in" the room.
> _____3. That you can visualize the room and be in it but not feel or sense the room presence.
> _____4. That you can actually feel yourself in the room and sense the room presence but still be aware of being in an office with your therapist.
> _____5. That you are completely involved in the situation and not be aware that you are in an office or in another person's presence.

The subjects were rated on a one to five scale (as presented above) on their visual imagery ability at the beginning of each session.

Physiological Recording of Specific Target Anxiety with Visual Imagery

(First Session Only.) After the subject's visual imagery ability was assessed, the S was asked to imagine the most anxiety provoking situation involving public speaking that he could imagine. (The therapist helped him with this task until the S stated that he was feeling extremely anxious and uncomfortable.) During this task, the S's heart rate was monitored and recorded. A comparable assessment was made at the end of treatment when the S reached the top of the anxiety hierarchy and experienced the same situation.

Construction of Anxiety Hierarchy

The anxiety hierarchy was one of the most important aspects of this treatment. The object was to determine situations which were related to speech presentations which ran from very slight, controllable amounts of anxiety to the most extreme anxiety attendant upon the actual speech presentation. It was not necessary to determine every instance, since generalization from one instance to another would bridge the gap. It was necessary to determine situations close enough together to allow generalizations to occur.

The Basic Speech-Anxiety Hierarchy

The following hierarchy is based on Paul's model (1966).

1. Reading about speeches alone in room (one to two weeks before).
2. Discussing coming speech a week before (in class or after).
3. In audience while another gives speech (week before presentation).
4. Writing speech in study area (room, library).
5. Practicing speech alone in room (or in front of roommate).
6. Getting dressed the morning of speech.
7. Activities just prior to leaving for speech (eating, practice).
8. Walking over to room on day of speech.
9. Entering room on day of speech.
10. Waiting while another person gives speech on day of presentation.
11. Walking up before the audience.
12. Presenting speech before the audience (see faces, etc.).

This hierarchy served only as a guide; each subject developed his own. The procedure was as follows: First it was explained to the S that it was important to determine the specific situations that caused him to be anxious;

from the least to the most anxiety producing. Next the subject was asked when he first noticed feelings of tenseness and anxiety; then each of the twelve items were examined to determine if some items should be excluded or others included. As the therapist and subject went through each item the therapist wrote down the specifics associated with each item, i.e., exactly where the subject studied, cues in his room, times, etc. It was important for the therapist to have enough understanding of each situation so that he could "fill in" an item during desensitization without help from the subject.

Training in Progressive Relaxation

This was a very important procedure and it was emphasized that it be mastered. It was explained to the subject that the technique would take some time (20-35 minutes) at first, but as he learned, the time for inducing deep relaxation would be shortened. Training began by having the subject systematically tense his gross-muscle systems, holding them until the therapist said "relax," at which time the subject would let go. It was explained that if the muscles were first tensed, then they would relax more deeply when they were released. Also it was pointed out that the subject should focus all his attention on each muscle system as he worked through the various groups, so that after practice he would not

have to tense the muscles first in order to achieve deep relaxation.

The Method (Instructions)

The subject should be seated in a reclining chair, with the therapist sitting slightly to one side. Legs should be extended, head resting on the back of the chair, and arms resting on the arms of the chair. No part of the body should require the use of muscles for support. Have the subject close his eyes to minimize external stimulation. The room should be quiet and lights dimmed if possible.

1. Instruct the subject to "make a fist with your dominant hand (usually right). Make a fist and tense the muscles of your (right) hand and forearm; tense until it trembles. Feel the muscles pull across your fingers and the lower part of your forearm." Have the subject hold this position for five to seven seconds, then say, "relax," instructing him to just let his hand go: "Pay attention to the muscles of your (right) hand and forearm as they relax. Note how those muscles feel as relaxation flows through them" (10-20 seconds).

   "Again, tense the muscles of your (right) hand and forearm. Pay attention to the muscles involved" (5 to 7 seconds). "OK, relax; attend

only to those muscles, and note how they feel as the relaxation takes place, becoming more and more relaxed, more relaxed than ever before. Each time we do this you'll relax even more until your arm and hand are completely relaxed with no tension at all, warm and relaxed." "Continue until subject reports his (right) hand and forearm are completely relaxed with no tension (usually 2-4 times is sufficient)."

2. Instruct the subject to tense his (right) biceps, leaving his hand and forearm on the chair. Proceed in the same manner as above, in a "hypnotic monotone," usually the (right) hand as a reference point, that is, move on when the subject reports his biceps feels as completely relaxed as his hand and forearm.

Proceed to other gross-muscle groups (listed below) in the same manner, with the same verbalization. For example: "Note how these muscles feel as they relax; feel the relaxation and warmth flow through these muscles; pay attention to these muscles so that later you can relax them again." Always use the preceding group as a reference for moving on.

3. Nondominant (left) hand and forearm--feel muscles over knuckles and on lower part of arm.
4. Nondominant (left) biceps.
5. Frown hard, tensing muscles of forehead and top of head (these muscles often "tingle" as they relax).
6. Wrinkle nose, feeling muscles across top of cheeks and upper lip.
7. Draw corners of mouth back, feeling jaw muscles and cheeks.
8. Tighten chin and throat muscles, feeling two muscles in front of throat.
9. Tighten chest muscles and muscles across back--feel muscles pull below shoulder blades.
10. Tighten abdominal muscles--make abdomen hard.
11. Tighten muscles of right upper leg--feel one muscle on top and two on the bottom of the upper leg.
12. Tighten right calf--feel muscles on bottom of right calf.
13. Push down with toes and arch right foot--feel pressure as if something were pushing up under the arch.
14. Left upper leg.
15. Left calf.
16. Left foot.

For most muscle groups, two presentations were enough. The subject was asked if he felt tension anywhere in his body. If he did, he was instructed to go back and repeat the tension-release cycle for that muscle group. It was sometimes helpful to instruct the subject to take a deep breath and hold it while tensing muscles, and then let it go while releasing. If any muscle group did not respond after four trials, it was omitted and focused on later.

In bringing subjects back to "normal," the numerical method of trance termination was used: "I'm going to count from one to four. On the count of one, start moving your legs; two, your fingers and hands; three, your head; and four, open your eyes and sit up. One--move your legs; two--now your fingers and hands; three--move your head around; four--open your eyes and sit up." Subjects were always checked to make sure that they felt well and alert before leaving.

The subject was instructed to practice relaxation twice a day between sessions. He was told not to work at it more than fifteen minutes at a time, and should not practice twice within any three-hour period. Also, he was instructed to practice alone.

As the sessions progressed, the subjects were able to become completely relaxed without going through the complete procedure. The subjects indicated complete relaxation by raising their finger.

Densesitization Proper--
Working Through the
Hierarchy Under Re-
laxation

Before beginning the desensitization procedure, each subject's visual imagery ability was tested. Also before desensitization, the subject was told that as he imaged a situation, he was to raise his index finger when he felt any tension or discomfort.

Instructions:

> I want you to set back in your chair and relax for a while (pause). OK, now I will describe situations that we have already talked about that cause you some discomfort, after I describe the scene I want you to become completely involved in the situation and allow yourself to "feel" what is going on. When you begin to feel somewhat anxious I want you to raise your index finger; at that point I will ask you to step thinking about the scene and concentrate on the tension, then I will have you practice relaxation to help get rid of the discomfort. I will ask you to continue visualizing the scene until you can visualize it without accompanying tension or anxiety. All right, let's begin.

After the subject was relaxed and the procedure explained, the presentation of images began with item (1).

> Now, I want you to visualize yourself sitting alone in your room two weeks before a speech, reading about speeches (30 seconds). Stop visualizing that, and go on relaxing. The subject was then asked (if he did not indicate anxiety) if he felt any tension and if he was able to start and stop the image on request. Item (1) was presented again and after 30 seconds the subject was instructed, stop visualizing that, and go on relaxing--completely relaxed, no tension anywhere in your body, warm and relaxed.

The above paridigm was followed throughout the hierarchy (if the subject did not indicate anxiety) i.e., each item in the hierarchy was presented with all major aspects of the image specified by the therapist. Thirty seconds were allowed to elapse after each presentation, then the subject was instructed to "stop visualizing that, and go on relaxing." Continued suggestions of warmth, lack of tension, heaviness, etc. were given for an additional thirty seconds. The image was then presented again. If the subject did not signal anxiety, and the therapist did not detect anxiety during the two thirty-second presentations, the next item on the hierarchy was initiated.

If the subject indicated anxiety or the therapist detected anxiety in the subject, the subject was immediately instructed to stop visualizing the scene and go on relaxing. Then the therapist would ask the subject where he felt anxious, when the subject told the therapist the location of the tension, the therapist helped the subject practice relaxation procedures to overcome the tension and help bring the subject back to the state of relaxation before the scene. The subject was told that the same item would be presented again only for a shorter period of time so that the subject would not experience any anxiety. The item was then presented again and if the subject still reported anxiety for that item, the previous item in the hierarchy was given until the item

did not produce anxiety. When the subject could successfully visualize an item two times, then the next item in the hierarchy was initiated.

One of the most important aspects of the desensitization treatment was the training of the subject to become more aware of his feelings of anxiousness and what he could do to aleviate these feelings.

All subjects completed the hierarchy in five sessions.

Evaluation of Relaxation State

At the end of each desensitization treatment session each subject was asked how he was feeling and if he was able to remain completely relaxed throughout the treatment. If he felt some residual tension at the end of the session, that tension was focused upon and relaxation techniques were practiced to aleviate the tension.

APPENDIX B

STUDENT QUESTIONNAIRE

Student Questionnaire

Dear student:

Today you are being asked to complete the accompanying public speaking questionnaire in conjunction with a study we are conducting in the Department of Education and the Department of Speech. This study is a continuation of work that has been underway for the past two years.

Briefly, we have been concerned with the number of students who experience situational anxieties, or emotional reactions in certain situations, during their college careers and in later life that not only make them uncomfortable and less happy, but can actually lower their academic grades and restrict earning potential. These reactions have been found to exist in approximately 20 per cent of the normal student population. We have worked with several of these students using psychological principles, training, and therapeutic procedures with excellent and gratifying results.

The purpose of the present study is to determine which people benefit most from the specific psychological procedures involved. We are focusing specifically upon the speech situation as one in which many students feel upset, worry, and suffer from a lack of confidence that interferes with effective performance, thus lowering grades, making life more complicated, and restricting interests and earning power. You, as an individual, may or may not experience these feelings. If you do, we may be able to help you overcome them, but in any case your responses will be most helpful to us, even if you have no major difficulty with your emotional reactions as a speaker.

All students in Speech 101 are being asked to complete the questionnaire. Additionally, we will be able to meet with a number of students to help them overcome anxieties related to public speaking and obtain more confidence as a speaker. Of course, not all students will be bothered by these problems, nor will all students feel they have the time or need for these services.

On the following page, you are asked to indicate whether you would or would not be interested in obtaining help with these difficulties, and whether you have the time available to participate. Participation in this phase of the program would require approximately 7 to 8 hours during the quarter. Five of these hours would be spent meeting with a trained specialist one hour per week toward the middle of the quarter. These meetings

will probably be in the evenings or on Saturday, depending upon your own schedule. These services would normally cost $15 to $20 per hour; however, this study is being supported by Michigan State University at no cost to you. An additional 1 to 1 1/2 hours of your time would be necessary to meet with a group of students and with me for further evaluation prior to treatment and again for 1 to 1 1/2 hours the week immediately following the treatment period. A short interview would also be scheduled following the first evaluation to discuss the results with you. This will mean approximately 7 or 8 hours total time during the quarter to participate in all phases.

Needless to say, your answers to the questions in the questionnaire, and participation in the other phases of the study will be kept strictly confidential; under no circumstances will they be made known to any instructor or official of the university. The general results of the study will be presented to the speech instructors after the quarter is completed, but even here, no names will be involved.

Thank you for your cooperation,

Paul E. Laemmle

Yes, I am interested in participating in the program_____

No, I am not interested_____

Name:_____

Address:_____

Phone:_____

APPENDIX C

S-R INVENTORY OF ANXIOUSNESS

An S-R Inventory of Anxiousness

"You are entering a final examination in an important course"

PLEASE DO NOT MARK THIS BOOKLET

Mark on the ANSWER SHEET one of the five alternative degrees of reaction or attitude for each of the following 14 items.

1.	Heart beats faster	1	2	3	4	5	
		Not at all				Much faster	
2.	Get an "uneasy feeling"	1	2	3	4	5	
		None				Very strongly	
3.	Emotions disrupt action	1	2	3	4	5	
		Not at all				Very disruptive	
4.	Feel exhilarated and thrilled	1	2	3	4	5	
		Very much				Not at all	
5.	Want to avoid situation	1	2	3	4	5	
		Not at all				Very much	
6.	Perspire	1	2	3	4	5	
		Not at all				Perspire much	
7.	Need to urinate frequently	1	2	3	4	5	
		Not at all				Very frequently	
8.	Enjoy the challenge	1	2	3	4	5	
		Enjoy much				Not at all	
9.	Mouth gets dry	1	2	3	4	5	
		Not at all				Very dry	
10.	Become immobilized	1	2	3	4	5	
		Not at all				Completely	
11.	Get full feeling in stomach	1	2	3	4	5	
		None				Very full	
12.	Seek experiences like this	1	2	3	4	5	
		Very much				Not at all	
13.	Have loose bowels	1	2	3	4	5	
		None				Very much	
14.	Experience nausea	1	2	3	4	5	
		Not at all				Much nausea	

PLEASE RECORD YOUR ANSWERS ON THE ANSWER SHEET

An S-R Inventory of Anxiousness

"You are going into an interview for a very important job"

PLEASE DO NOT MARK THIS BOOKLET

Mark on the ANSWER SHEET one of the five alternative degrees of reaction or attitude for each of the following 14 items.

15.	Heart beats faster		1	2	3	4	5
		Not at all					Much faster
16.	Get an "uneasy feeling"		1	2	3	4	5
		None					Very strongly
17.	Emotions disrupt action		1	2	3	4	5
		Not at all					Very disruptive
18.	Feel exhilarated and thrilled		1	2	3	4	5
		Very much					Not al all
19.	Want to avoid situation		1	2	3	4	5
		Not at all					Very much
20.	Perspire		1	2	3	4	5
		Not at all					Perspire much
21.	Need to urinate frequently		1	2	3	4	5
		Not at all					Very frequently
22.	Enjoy the challenge		1	2	3	4	5
		Enjoy much					Not at all
23.	Mouth gets dry		1	2	3	4	5
		Not at all					Very dry
24.	Become immobilized		1	2	3	4	5
		Not at all					Completely
25.	Get full feeling in stomach	None					Very full
26.	Seek experiences like this		1	2	3	4	5
		Very much					Not at all
27.	Have loose bowels		1	2	3	4	5
		None					Very much
28.	Experience nausea		1	2	3	4	5
		Not at all					Much nausea

PLEASE RECORD YOUR ANSWERS ON THE ANSWER SHEET

An S-R Inventory of Anxiousness

"You are alone in the woods at night"

PLEASE DO NOT MARK THIS BOOKLET

Mark on the ANSWER SHEET one of the five alternative degrees of reaction or attitude for each of the following 14 items.

29.	Heart beats faster	1	2	3	4	5	
		Not at all				Much faster	
30.	Get an "uneasy feeling"	1	2	3	4	5	
		None				Very strongly	
31.	Emotions disrupt action	1	2	3	4	5	
		Not at all				Very disruptive	
32.	Feel exhilarated and thrilled	1	2	3	4	5	
		Very much				Not at all	
33.	Want to avoid situation	1	2	3	4	5	
		Not at all				Very much	
34.	Perspire	1	2	3	4	5	
		Not at all				Perspire much	
35.	Need to urinate frequently	1	2	3	4	5	
		Not at all				Very frequently	
36.	Enjoy the challenge	1	2	3	4	5	
		Enjoy much				Not at all	
37.	Mouth gets dry	1	2	3	4	5	
		Not at all				Very dry	
38.	Become immobilized	1	2	3	4	5	
		Not at all				Completely	
39.	Get full feeling in stomach	1	2	3	4	5	
		None				Very full	
40.	Seek experiences like this	1	2	3	4	5	
		Very much				Not at all	
41.	Have loose bowels	1	2	3	4	5	
		None				Very much	
42.	Experience nausea	1	2	3	4	5	
		Not at all				Much nausea	

PLEASE RECORD YOUR ANSWERS ON THE ANSWER SHEET

An S-R Inventory of Anxiousness

"You are entering a competitive contest before spectators"

PLEASE DO NOT MARK THIS BOOKLET

Mark on the ANSWER SHEET one of the five alternative degrees of reaction or attitude for each of the following 14 items.

43.	Heart bests faster	1	2	3	4	5	
		Not at all				Much faster	
44.	Get an "uneasy feeling"	1	2	3	4	5	
		None				Very strongly	
45.	Emotions disrupt action	1	2	3	4	5	
		Not at all				Very disruptive	
46.	Feel exhilarated and thrilled	1	2	3	4	5	
		Very much				Not at all	
47.	Want to avoid situation	1	2	3	4	5	
		Not at all				Very much	
48.	Perspire	1	2	3	4	5	
		Not at all				Perspire much	
49.	Need to urinate frequently	1	2	3	4	5	
		Not at all				Very frequently	
50.	Enjoy the challenge	1	2	3	4	5	
		Enjoy much				Not at all	
51.	Mouth gets dry	1	2	3	4	5	
		Not at all				Very dry	
52.	Become immobilized	1	2	3	4	5	
		Not at all				Completely	
53.	Get full feeling in stomach	1	2	3	4	5	
		None				Very full	
54.	Seek experiences like this	1	2	3	4	5	
		Very much				Not at all	
55.	Have loose bowels	1	2	3	4	5	
		None				Very much	
56.	Experience nausea	1	2	3	4	5	
		Not at all				Much nausea	

PLEASE RECORD YOUR ANSWERS ON THE ANSWER SHEET

An S-R Inventory of Anxiousness

"You are starting out in a sail boat onto a rough sea"

PLEASE DO NOT MARK THIS BOOKLET

Mark on the ANSWER SHEET one of the five alternative degrees of reaction or attitude for each of the following 14 items.

57.	Heart beats faster	1 Not at all	2	3	4	5 Much faster
58.	Get an "uneasy feeling"	1 None	2	3	4	5 Very strongly
59.	Emotions disrupt action	1 Not at all	2	3	4	5 Very disruptive
60.	Feel exhilarated and thrilled	1 Very much	2	3	4	5 Not at all
61.	Want to avoid situation	1 Not at all	2	3	4	5 Very much
62.	Perspire	1 Not at all	2	3	4	5 Perspire much
63.	Need to urinate frequently	1 Not at all	2	3	4	5 Very frequently
64.	Enjoy the challenge	1 Enjoy much	2	3	4	5 Not at all
65.	Mouth gets dry	1 Not at all	2	3	4	5 Very dry
66.	Become immobilized	1 Not at all	2	3	4	5 Completely
67.	Get full feeling in stomach	1 None	2	3	4	5 Very full
68.	Seek experiences like this	1 Very much	2	3	4	5 Not at all
69.	Have loose bowels	1 None	2	3	4	5 Very much
70.	Experience nausea	1 Not at all	2	3	4	5 Much nausea

PLEASE RECORD YOUR ANSWERS ON THE ANSWER SHEET

An S-R Inventory of Anxiousness

"You are going to a counseling bureau to seek help in solving a personal problem"

PLEASE DO NOT MARK THIS BOOKLET

Mark on the ANSWER SHEET one of the five alternative degrees of reaction or attitude for each of the following 14 items.

71.	Heart beats faster	1	2	3	4	5	
		Not at all				Much faster	
72.	Get an "uneasy feeling"	1	2	3	4	5	
		None				Very strongly	
73.	Emotions disrupt action	1	2	3	4	5	
		Not at all				Very disruptive	
74.	Feel exhilarated and thrilled	1	2	3	4	5	
		Very much				Not at all	
75.	Want to avoid situation	1	2	3	4	5	
		Not at all				Very much	
76.	Perspire	1	2	3	4	5	
		Not at all				Perspire much	
77.	Need to urinate frequently	1	2	3	4	5	
		Not at all				Very frequently	
78.	Enjoy the challenge	1	2	3	4	5	
		Enjoy much				Not at all	
79.	Mouth gets dry	1	2	3	4	5	
		Not at all				Very dry	
80.	Become immobilized	1	2	3	4	5	
		Not at all				Completely	
81.	Get full feeling in stomach	1	2	3	4	5	
		None				Very full	
82.	Seek experiences like this	1	2	3	4	5	
		Very much				Not at all	
83.	Have loose bowels	1	2	3	4	5	
		None				Very much	
84.	Experience nausea	1	2	3	4	5	
		Not at all				Much nausea	

PLEASE RECORD YOUR ANSWERS ON THE ANSWER SHEET

An S-R Inventory of Anxiousness

"You are getting up to give a speech before a large group"

PLEASE DO NOT MARK THIS BOOKLET

Mark on the ANSWER SHEET one of the five alternative degrees of reaction or attitude for each of the following 14 items.

85.	Heart beats faster	1 Not at all	2	3	4	5 Much faster
86.	Get an "uneasy feeling"	1 None	2	3	4	5 Very strongly
87.	Emotions disrupt action	1 Not at all	2	3	4	5 Very disruptive
88.	Feel exhilarated and thrilled	1 Very much	2	3	4	5 Not at all
89.	Want to avoid situation	1 Not at all	2	3	4	5 Very much
90.	Perspire	1 Not at all	2	3	4	5 Perspire much
91.	Need to urinate frequently	1 Not at all	2	3	4	5 Very frequently
92.	Enjoy the challenge	1 Enjoy much	2	3	4	5 Not at all
93.	Mouth gets dry	1 Not at all	2	3	4	5 Very dry
94.	Become immobilized	1 Not at all	2	3	4	5 Completely
95.	Get full feeling in stomach	1 None	2	3	4	5 Very full
96.	Seek experiences like this	1 Very much	2	3	4	5 Not at all
97.	Have loose bowels	1 None	2	3	4	5 Very much
98.	Experience nausea	1 Not at all	2	3	4	5 Much nausea

PLEASE RECORD YOUR ANSWERS ON THE ANSWER SHEET

An S-R Inventory of Anxiousness

"You are crawling along a ledge high on a mountain side"

PLEASE DO NOT MARK THIS BOOKLET

Mark on the ANSWER SHEET one of the five alternative degrees of reaction or attitude for each of the following 14 items.

99.	Heart beats faster	1	2	3	4	5
		Not at all				Much faster
100.	Get an "uneasy feeling"	1	2	3	4	5
		None				Very strongly
101.	Emotions disrupt action	1	2	3	4	5
		Not at all				Very disruptive
102.	Feel exhilarated and thrilled	1	2	3	4	5
		Very much				Not at all
103.	Want to avoid situation	1	2	3	4	5
		Not at all				Very much
104.	Perspire	1	2	3	4	5
		Not at all				Perspire much
105.	Need to urinate frequently	1	2	3	4	5
		Not at all				Very frequently
106.	Enjoy the challenge	1	2	3	4	5
		Enjoy much				Not at all
107.	Mouth gets dry	1	2	3	4	5
		Not at all				Very dry
108.	Become immobilized	1	2	3	4	5
		Not at all				Completely
109.	Get full feeling in stomach	1	2	3	4	5
		None				Very full
110.	Seek experiences like this	1	2	3	4	5
		Very much				Not at all
111.	Have loose bowels	1	2	3	4	5
		None				Very much
112.	Experience nausea	1	2	3	4	5
		Not at all				Much nausea

PLEASE RECORD YOUR ANSWERS ON THE ANSWER SHEET

An S-R Inventory of Anxiousness

"You are going into a psychological experiment"

PLEASE DO NOT MARK THIS BOOKLET

Mark on the ANSWER SHEET one of the five alternative degrees of reaction or attitude for each of the following 14 items.

113.	Heart beats faster	1 Not at all	2	3	4	5 Much faster
114.	Get an "uneasy feeling"	1 None	2	3	4	5 Very strongly
115.	Emotions disrupt action	1 Not at all	2	3	4	5 Very disruptive
116.	Feel exhilarated and thrilled	1 Very much	2	3	4	5 Not at all
117.	Want to avoid situation	1 Not at all	2	3	4	5 Very much
118.	Perspire	1 Not at all	2	3	4	5 Perspire much
119.	Need to urinate frequently	1 Not at all	2	3	4	5 Very frequently
120.	Enjoy the challenge	1 Enjoy much	2	3	4	5 Not at all
121.	Mouth gets dry	1 Not at all	2	3	4	5 Very dry
122.	Become immobilized	1 Not at all	2	3	4	5 Completely
123.	Get full feeling in stomach	1 None	2	3	4	5 Very full
124.	Seek experiences like this	1 Very much	2	3	4	5 Not at all
125.	Have loose bowels	1 None	2	3	4	5 Very much
126.	Experience nausea	1 Not at all	2	3	4	5 Much nausea

PLEASE RECORD YOUR ANSWERS ON THE ANSWER SHEET

An S-R Inventory of Anxiousness

"You are going to meet a new date"

PLEASE DO NOT MARK THIS BOOKLET

Mark on the ANSWER SHEET one of the five alternative degrees of reactions or attitude for each of the following 14 items.

127.	Heart beats faster	1	2	3	4	5	
		Not at all				Much faster	
128.	Get an "uneasy feeling"	1	2	3	4	5	
		None				Very strongly	
129.	Emotions disrupt action	1	2	3	4	5	
		Not at all				Very disruptive	
130.	Feel exhilarated and thrilled	1	2	3	4	5	
		Very much				Not at all	
131.	Want to avoid situation	1	2	3	4	5	
		Not at all				Very much	
132.	Perspire	1	2	3	4	5	
		Not at all				Perspire much	
133.	Need to urinate frequently	1	2	3	4	5	
		Not at all				Very frequently	
134.	Enjoy the challenge	1	2	3	4	5	
		Enjoy much				Not at all	
135.	Mouth gets dry	1	2	3	4	5	
		Not at all				Very dry	
136.	Become immobilized	1	2	3	4	5	
		Not at all				Completely	
137.	Get full feeling in stomach	1	2	3	4	5	
		None				Very full	
138.	Seek experience like this	1	2	3	4	5	
		Very much				Not at all	
139.	Have loose bowels	1	2	3	4	5	
		None				Very much	
140.	Experience nausea	1	2	3	4	5	
		Not at all				Much nausea	

PLEASE RECORD YOUR ANSWERS ON THE ANSWER SHEET

An S-R Inventory of Anxiousness

"You are just starting off on a long automobile trip"

PLEASE DO NOT MARK THIS BOOKLET

Mark on the ANSWER SHEET one of the five alternative degrees of reaction or attitude for each of the following 14 items.

141.	Heart beats faster	1	2	3	4	5
		Not at all				Much faster
142.	Get an "uneasy feeling"	1	2	3	4	5
		None				Very strongly
143.	Emotions disrupt action	1	2	3	4	5
		Not at all				Very disruptive
144.	Feel exhilarated and thrilled	1	2	3	4	5
		Very much				Not at all
145.	Want to avoid situation	1	2	3	4	5
		Not at all				Very much
146.	Perspire	1	2	3	4	5
		Not at all				Perspire much
147.	Need to urinate frequently	1	2	3	4	5
		Not at all				Very frequently
148.	Enjoy the challenge	1	2	3	4	5
		Enjoy much				Not at all
149.	Mouth gets dry	1	2	3	4	5
		Not at all				Very dry
150.	Become immobilized	1	2	3	4	5
		Not at all				Completely
151.	Get full feeling in stomach	1	2	3	4	5
		None				Very full
152.	Seek experiences like this	1	2	3	4	5
		Very much				Not at all
153.	Have loose bowels	1	2	3	4	5
		None				Very much
154.	Experience nausea	1	2	3	4	5
		Not at all				Much nausea

PLEASE RECORD YOUR ANSWERS ON THE ANSWER SHEET

APPENDIX D

THAYER ADJECTIVE CHECK LIST

Thayer Adjective Check List

Name_____ Date and Time_____

Course Title and No._____ Instructor_____

PLEASE COMPLETE THIS IMMEDIATELY AFTER FINISHING THE SPEECH

Each of the words on the next sheet describes feelings or mood. Please use the list to describe your feelings at this moment.

If the word definitely describes how you feel at the moment you read it, circle the double check (vv) to the right of the word. For example, if the word is, relaxed, and you are definitely feeling relaxed at the moment, circle the double vv as follows: relaxed (vv) v ? no.
This means you definitely feel relaxed at the moment.

If the word only slightly applies to your feelings at the moment, circle the single check as follows:
relaxed vv (v) ? no.
This means you feel slightly relaxed at the moment.

If the word is not clear to you or you cannot decide whether or not it applies to your feelings at the moment, circle the question mark as follows: relaxed vv v (?) no
This means you cannot decide whether you are relaxed or not.

If you clearly decide the word does not apply to your feelings at the moment, circle the no as follows: relaxed vv v ? (no)
This means you are definitely not relaxed at the moment.

Work rapidly. Your first reaction is best. Work down the first column, then go on to the next. Please mark all words. This should take only a few minutes.

Now please turn the page and begin working.

vv v ? no: definitely feel
vv v ? no: feel slightly
vv v ? no: cannot decide
vv v ? no: definitely do not feel

carefree vv v ? no
serious vv v ? no
peppy vv v ? no
pleased vv v ? no
Placed vv vv ? no
leisurely vv v ? no
sleepy vv v ? no
jittery vv v ? no
intense vv v ? no
grouchy vv v ? no
energetic vv v ? no
egotistic vv v ? no
calm vv v ? no
suspicious vv v ? no
tired v v ? no
regretful vv v ? no
stirred-up vv v ? no
warm-hearted vv v ? no
vigorous vv v ? no
engaged-in-thought vv v ? no
at rest vv v ? no
elated vv v ? no
drowsy vv v ? no
witty v v ? no

aroused vv v ? no
fearful vv v ? no
lively vv v ? no
still vv v ? no
self-centered vv v ? no
wide-awake vv v ? no
skeptical vv v ? no
activated vv v ? no
sad vv v ? no
full-of-pep vv v ? no
affectionate vv v ? no
rebellious vv v ? no
quiet vv v ? no
concentrating vv v ? no
sluggish vv v ? no
overjoyed vv v ? no
quick vv v ? no
nonchalant vv v ? no
quiescent vv v ? no
clutched-up vv v ? no
wakeful vv v ? no
active vv v ? no
blue vv v ? no
defiant v v ? no

APPENDIX E

PERSONAL REPORT OF CONFIDENCE AS A SPEAKER

Personal Report of Confidence as a Speaker

(Modified Form)

This instrument is composed of thirty items regarding your feelings of confidence as a speaker. After each question there is a "true" and a "false."

Try to decide whether "true" or "false" most represents your feelings associated with your most recent speech, then put a circle around the "true" or "false." Remember that this information is completely confidential and will not be made known to your instructor. Work quickly and don't spend much time on any one question. We want your first impression on this questionnaire. Now go ahead, work quickly, and remember to answer every question.

		1	2
1.	I look forward to an opportunity to speak in public.	T	F
2.	My hands tremble when I try to handle objects on the platform.	T	F
3.	I am in constant fear of forgetting my speech.	T	F
4.	Audiences seem friendly when I address them.	T	F
5.	While preparing a speech I am in a constant state of anxiety.	T	F
6.	At the conclusion of a speech I feel that I have had a pleasant experience.	T	F
7.	I dislike to use my body and voice expressively.	T	F
8.	My thoughts become confused and jumbled when I speak before an audience.	T	F
9.	I have no fear of facing an audience.	T	F
10.	Although I am nervous just before getting up I soon forget my fears and enjoy the experience.	T	F
11.	I face the prospect of making a speech with complete confidence.	T	F
12.	I feel that I am in complete possession of myself while speaking.	T	F

		1	2
13.	I prefer to have notes on the platform in case I forget my speech.	T	F
14.	I like to observe the reactions of my audience to my speech.	T	F
15.	Although I talk fluently with friends I am at a loss for words on the platform.	T	F
16.	I feel relaxed and comfortable while speaking.	T	F
17.	Although I do not enjoy speaking in public I do not particularly dread it.	T	F
18.	I always avoid speaking in public if possible.	T	F
19.	The faces of my audience are blurred when I look at them.	T	F
20.	I feel disgusted with myself after trying to address a group of people.	T	F
21.	I enjoy preparing a talk	T	F
22.	My mind is clear when I face an audience.	T	F
23.	I am fairly fluent.	T	F
24.	I perspire and tremble just before getting up to speak.	T	F
25.	My posture feels strained and unnatural.	T	F
26.	I am fearful and tense all the while I am speaking before a group of people.	T	F
27.	I find the prospect of speaking mildly pleasant.	T	F
28.	It is difficult for me to calmly search my mind for the right words to express my thoughts.	T	F
29.	I am terrified at the thought of speaking before a group of people.	T	F
30.	I have a feeling of alertness in facing an audience.	T	F

APPENDIX F

PUBLIC SPEAKING ANXIETY INVENTORY

Name_____

Date_____

Public Speaking Anxiety Inventory

This form is composed of statements regarding your feelings of tension and stress (anxiety) in giving an important speech. After each question circle the letter which best describes your present feelings. Think back to your most recent important speech on which you experienced tension and stress. Work quickly and don't spend much time on any one question. Your first impression of each question is most important. Now go ahead, work quickly, and remember to answer every question. Circle the letter which represents your present feeling.

Rarely or Never	Infrequently	Occasionally	Frequently	Always or Almost Always
R	I	O	F	A
(1)	(2)	(3)	(4)	(5)

1. While preparing for a speech I feel tense and nervous. R I O F A
2. I feel tense when I see the words "final speech" on a course outline when studying. R I O F A
3. My thoughts become confused and jumbled when I am giving a speech. R I O F A
4. Right after giving a speech I feel that I have had a pleasant experience. R I O F A
5. I get anxious when I think about a speech coming up. R I O F A
6. I have no fear of giving a speech. R I O F A
7. Although I am nervous just before presenting a speech, I soon settle down after beginning the speech and feel calm and comfortable. R I O F A
8. I look forward to giving a speech. R I O F A

9.	When the instructor announces a speech in class I can feel myself getting tense.	R I O F A
10.	My hands tremble when I am giving a speech.	R I O F A
11.	I feel relaxed while giving a speech.	R I O F A
12.	I enjoy preparing for a speech.	R I O F A
13.	I am in constant fear of forgetting what I have prepared.	R I O F A
14.	I get anxious if someone asks me something about the area of my speech that I do not know.	R I O F A
15.	I face the prospect of giving a speech with confidence.	R I O F A
16.	I feel I am in complete possession of myself while giving a speech.	R I O F A
17.	My mind is clear when giving a speech.	R I O F A
18.	I do not dread giving a speech.	R I O F A
19.	I perspire just before presenting a speech.	R I O F A
20.	My heart beats very fast just as I begin to present an important speech.	R I O F A
21.	I experience considerable anxiety while sitting in the classroom just before presenting my speech.	R I O F A
22.	Certain parts of my body feel very tense and rigid while presenting a speech.	R I O F A
23.	Realizing only a little time remains in which to complete my speech makes me very tense and anxious.	R I O F A
24.	In presenting a speech I know I can control my feelings of tension and stress.	R I O F A
25.	I breathe faster just before presenting a speech.	R I O F A
26.	I feel comfortable and relaxed in the hour or so just before presenting a speech.	R I O F A

27. I present poorer speeches because I am anxious. R I O F A

28. I feel anxious when the teacher announces the date of a speech. R I O F A

29. When I have trouble remembering part of my speech, I find it hard to concentrate on the remainder of the speech. R I O F A

30. During an important speech I experience a feeling of helplessness building up inside me. R I O F A

31. I have trouble falling asleep the night before an important speech. R I O F A

32. My heart beats very fast during an important speech. R I O F A

33. I feel anxious when the speech assignment is given. R I O F A

34. During a speech I get so nervous I forget facts that I really know. R I O F A

APPENDIX G

BEHAVIORAL CHECK LIST

TIMED BEHAVIORAL CHECK LIST FOR PERFORMANCE ANXIETY

Rater_____ Name_____

Date_____ Speech No._____ I.D._____

Behavior Observed	Time Period								
	1	2	3	4	5	6	7	8	Σ
1. Paces									
2. Sways									
3. Shuffles Feet									
4. Knees Tremble									
5. Extraneous Arm and Hand Movement (swings, scratches, toys, etc.)									
6. Arms Rigid									
7. Hands Restrained (in pockets, behind back, clasped)									
8. Hands Tremor									
9. No Eye Contact									
10. Face Muscles Tense (drawn, tics, grimaces)									
11. Face "Deadpan"									
12. Face pale									
13. Face Flushed (blushes)									
14. Moistens Lips									
15. Swallows									
16. Clears Throat									
17. Breathes Heavily									

Behavior Observed	Time Period								
	1	2	3	4	5	6	7	8	Σ
18. Perspires (face, hands, armpits)									
19. Voice Quivers									
20. Speech Blocks or Stammers									
Comments:								ΣΣ	

APPENDIX H

FOLLOW-UP BATTERY DATA SHEET

Follow-Up Battery Data Sheet

Name_____Age_____Sex_____
Date_____I.D. Number_____Phone_____
Class (Frsh., Soph., etc.)_____Major_____
Course and Section_____Instructor_____

Please answer by circling the appropriate alternatives:

1. Did you participate in the "outside" evaluation speeches of this project? (yes; no)

   a. Did you find these speeches helpful? (not applicable; not at all; somewhat; much; very much)

2. Did you meet with someone on a regular basis, in conjunction with this project, to work on alleviating anxiety connected with situational stress such as public speaking? (yes; no)

   a. To what degree do you feel these sessions have been helpful in overcoming anxieties related to public speaking? (not applicable; not at all; somewhat; much; very much)

   b. To what degree have these sessions been helpful in other areas, in addition to the speech situation? (not applicable; not at all; somewhat; much; very much) Please indicate other situations or areas in which these meetings have helped_____

   c. With whom did you meet? (name)_____

   d. What is your opinion of this person?
   (incompetent; competent; very competent)
   (unlikable; likable; very likable)

3. Did you meet with anyone for help of a psychological nature during the semester, not in conjunction with this project?
   (yes; no) If yes, (name)_____

Please indicate by checking (a) or (b) if appropriate. Remember that your answers are completely confidential.

_____(a) I would like to meet with someone next quarter to work on overcoming emotional reactions attendant upon public speaking.

_____(b) I would like to obtain the results of this test battery. (If you are interested in obtaining these results, call 355-8123 the latter part of April to arrange for an appointment.

APPENDIX I

INDIVIDUAL HIERARCHIES

Subject #1

1. Talking about speech class to friends before the course begins.
2. Discussing coming speech a week before (after class).
3. In audience while another gives speech (week before presentation).
4. Searching for a topic and examining personal experiences for an idea.
5. Night before speech--practicing speech in front of mirror.
6. Getting dressed in morning of speech.
7. Activities prior to leaving for speech (eating, practice).
8. Walking to speech class (107 Holden Hall).
9. Entering room on day of speech.
10. Waiting while another person gives speech on day of presentation.
11. Walking up before the audience.
12. Presenting speech before the audience (see faces, etc.).

Subject #2

1. It's near the end of your first class meeting, the instructor reads off your name and assigns you a speech to be given in a week.

2. It's the next day and you're trying to decide on a topic.

3. It's the next class meeting, the instructor calls off your name and reminds you of your speech next week.

4. You've picked a topic and are now at the library trying to find material on it.

5. You're in your room trying to organize this material into a good speech.

6. You're in your room practicing your speech before a mirror.

7. Practicing before roommates.

8. Practicing before friends.

9. Evening before speech.

10. Morning of speech.

11. Riding to speech class on bus.

Subject #3

1. It's near the end of your first class meeting, the instructor reads off your name and assigns you a speech to be given in a week.
2. It's the next day and you're trying to decide on a topic.
3. It's the next class meeting, the instructor calls off your name and reminds you of your speech next week.
4. You've picked a topic and are now at the library trying to find material on it.
5. You're in your room trying to organize this material into a good speech.
6. You're in your room practicing your speech before a mirror.
7. Practicing before roommates.
8. Practicing before friends.
9. Evening before speech.
10. Morning of speech.
11. Walking to speech class.
12. Sitting in class waiting to be called.
13. Calls person ahead of you.
14. Calls your name.
15. You walk to front of class, turn and prepare to deliver speech.
16. Giving speech.

Subject #4

1. Registering for your speech class.
2. Thinking about speeches you will have to give during the term.
3. First day of class instructor says, "each student will be required to give six speeches this term."
4. Second class meeting, instructor calls off your name and tells you to have a speech ready next week, but gives no date.
5. The evening of the same day, you're trying to decide on a topic.
6. You've picked a topic and are researching it in the library.
7. Practicing before a mirror.
8. Practicing before roommates.
9. Night before the speech.
10. Morning of speech.
11. Riding bike to speech class.
12. Two people before you.
13. One person before you.
14. Person before you finishes, instructor gives his critique.
15. Instructor calls your name.
16. You leave your seat and walk to front of room.
17. Turn and face the audience and prepare to give your speech.
18. Giving your speech.

Subject #5

1. First class meeting instructor announces, "everyone will be required to give six speeches.
2. You've been assigned a speech to be given in a week.
3. You're trying to decide on a topic.
4. Instructor reminds you of speech to be given at next class meeting.
5. You've picked a topic and are looking for material on it.
6. Trying to organize the material for a good delivery.
7. You're now practicing it for the first time in your room, alone.
8. Practicing speech before five or six friends.
9. Evening before speech.
10. Morning of speech.
11. Leaving home to go to speech class.
12. You're sitting in speech class the day of your speech.
13. Speaker before you is giving his speech.
14. Speaker finishes and instructor give critique.
15. Calls your name to give your speech.
16. Walk to the front of the room.
17. Turn and face audience.
18. Begin speech.

Subject #6

1. Registering for speech class.
2. First class meeting, instructor announces, "everyone will be required to give six speeches."
3. Second class meeting, instructor calls off your name and tells you to have a speech ready next week, but gives no date.
4. You're trying to decide on a topic.
5. You've picked a topic and are researching it in the library.
6. You're in your room trying to organize this material into a good speech.
7. You're now practicing it for the first time in your room, alone.
8. Practicing speech before roommates.
9. Evening of speech.
10. Morning of speech.
11. Leave your apartment and head for speech class in auditorium.
12. Class begins, first speaker presents his speech.
13. Calls your name to give your speech.
14. You rise and walk to front of class.
15. Turn and face audience and prepare to begin speaking.
16. Giving speech.

Subject #7

1. Being in an audience listening to a speech.
2. Thinking about a speech two weeks away.
3. Thinking about giving a speech one week away.
4. Organizing the material for a speech.
5. Practicing a speech the day before you are to give it.
6. Practicing before your friends.
7. Night before the speech--hard to sleep.
8. Morning of the speech, you're concentrating on the delivery of the speech.
9. One hour before the speech.
10. Walking to your speech class.
11. You're in your speech class waiting for your name to be called.
12. He calls your name.
13. You begin to leave your seat and walk to front of class.
14. You turn and face audience--all those people looking at you and waiting.
15. You begin to give your speech.

Subject #8

1. Watching a person give a speech who has trouble.
2. Pre-registering for Speech 101.
3. Seeing an outline of speeches to be given at the beginning of term.
4. Practicing a speech a week before.
5. Night before--practicing speech.
6. Two hours before speech--go over material and practice.
7. Practice speech with wife at noon hour.
8. Stop at bathroom on way to speech class.
9. Enter speech room.
10. One person ahead giving speech.
11. Waiting just before giving speech.
12. Walking to podium.
13. A few seconds before speech.
14. Giving speech.

Subject #9

1. Talking to advisor about taking Speech 101.
2. One hour before going to first speech class.
3. Walking into first speech class.
4. Preparing speech plan (organizing it).
5. Practicing in front of mirror--couldn't look at self. Always looked at notes.
6. Night before speech.
7. Leaving dorm to classroom--(Hubbard Hall).
8. One hour before speech (first class in morning is speech).
9. Walking into class and seeing the instructor.
10. Good speech before yours.
11. One speaker ahead of you.
12. Walking to podium.
13. Situating self at podium.
14. At beginning of speech--facing audience (eye contact).
15. Giving speech.

Subject #10

1. After talking to advisor about Speech 101.
2. During winter vacation thinking about Speech 101 for winter quarter.
3. Going to first speech class.
4. Course outline was discussed (not much time to do all preparation).
5. Assign first impromptu speech.
6. Practicing speech day before.
7. Night before speech.
8. Morning of speech--have class first thing in morning.
9. Going into classroom.
10. Waiting while others are speaking.
11. One person ahead.
12. Walking up to podium.
13. Legs shake when up to speak--no control.
14. Instant before giving speech.
15. Giving speech.

Subject #11

1. Looking at course outline during first class.
2. Speech assignment during first week.
3. Practicing speech a couple days before.
4. Night before speech--working on speech.
5. Rehearsing the night before.
6. Trying to sleep the night before.
7. Morning before--last minute preparations.
8. One-half hour before--trying to memorize facts.
9. Put coat on--leave for class.
10. Walking to the class.
11. Enter class.
12. Speakers before--not listening to them--wondering about control.
13. Minutes before speech.
14. Walking up to podium--shaky.
15. Start speech.
16. Toward middle of speech--(forget part of speech).
17. Finish speech.

Subject #12

1. Practicing a speech a week before someone who is an expert.
2. Watching a person giving a speech before an apathetic audience.
3. Writing speech in study area--forced topic.
4. Practicing a speech in front of roommate.
5. Night before speech--feeling not prepared.
6. Morning of speech--getting dressed.
7. Activities just prior to leaving for speech (eating, practice).
8. Walking over to room on day of speech.
9. Entering classroom on day of speech.
10. Waiting while another person gives speech on day of presentation.
11. Walking up before audience.
12. Presenting speech before the audience (see faces, etc.).

APPENDIX J

SIMPLE CORRELATIONS

Simple Correlations

Variable No.

3 = Pre-Post change score on the Personal Report of Confidence as a Speaker.

4 = Post-test score on the Personal Report of Confidence as a Speaker.

5 = Pre-post change score on the Public Speaking Anxiety Inventory.

6 = Post-test score on the Public Speaking Anxiety Inventory.

7 = Pre-post change score on the S-R Inventory of Anxiousness--Total Test.

8 = Pre-post change score on the S-R Inventory of Anxiousness--Speech Section.

9 = Post-test score on the S-R Inventory of Anxiousness--Total Test.

10 = Post-test score on the S-R Inventory of Anxiousness--Speech Section.

11 = Pre-post change score on the Self Ratings.

12 = Post-test score on the Self Ratings.

13 = Pre-post change score on the Thayer Adjective Check List.

14 = Post-test score on the Thayer Adjective Check List.

15 = Pre-post change score on the Observer Ratings.

16 = Post-test score on the Observer Ratings.

17 = Myers-Briggs Personality Type

18 = Pre-post change score for Heart Rate measurement.

19 = Post-test score for Heart Rate measurement.

20 = Pre-post change score for Visual Imagery Heart Rate.

21 = Post-test score for Visual Imagery Heart Rate.

Variable No.

22 = Test of Visual Imagery.

23 = Heart Rate during relaxation, Session 1

24 = Heart Rate during relaxation, Session 2

25 = Heart Rate during relaxation, Session 3

26 = Heart Rate during relaxation, Session 4

27 = Heart Rate during Relaxation, Session 5

28 = Ss Normal Heart Rate.

29 = Therapist's Number.

Variable Number	3*	4	5	6	7	8	9	10	11	12	13	14	15
3	1.00000												
4	0.47755	1.00000											
5	0.87936	0.47095	1.00000										
6	0.43857	0.89444	0.47726	1.00000									
7	0.56015	0.46281	0.55022	0.51365	1.00000								
8	0.63522	0.44914	0.65809	0.44736	0.54057	1.00000							
9	0.18271	0.46272	0.18763	0.54402	0.58311	0.25681	1.00000						
10	0.16637	0.57812	0.28174	0.57300	0.23384	[illegible]	0.54135	1.00000					
11	0.38195	-0.09936	0.53229	0.30477	0.43349	0.31215	0.17291	-0.02212	1.00000				
12	0.24657	0.58236	0.45404	0.60614	[illegible]	[illegible]	0.13544	[illegible]	0.32656	1.00000			
13	0.29529	0.22081	0.45316	0.13473	0.23264	[illegible]	-0.15235	[illegible]	0.10353	0.34279	1.00000		
14	0.06944	0.33959	0.25275	0.34903	0.27424	[illegible]	0.24100	0.42431	[illegible]	0.50347	0.43523	1.00000	
15	-0.30726	-0.17658	-0.15622	-0.16242	[illegible]	[illegible]	-0.03602	[illegible]	0.04142	0.35169	-0.00658	0.11970	1.00000
16	-0.19777	0.11482	-0.07716	0.18702	0.03830	-0.25514	0.21864	[illegible]	0.25876	0.37627	-0.13644	0.10591	0.52416
17	-0.20776	-0.42290	-0.30624	-0.45134	-0.33094	-0.13665	[illegible]	-0.15437	-0.00882	-0.28031	0.19592	-0.19746	0.02238
18	0.41812	0.24370	0.48001	0.29130	0.14141	0.36077	0.01118	0.17105	0.62193	0.28636	0.28663	0.11451	-0.04199
19	-0.08352	-0.07362	-0.07260	-0.11340	-0.05208	-0.11041	-0.10313	-0.13153	0.10219	0.15153	0.03123	0.06401	0.15684
20	0.23772	-0.04372	0.25532	-0.03670	-0.11747	[illegible]	-0.28463	-0.14111	0.39428	-0.11981	0.21093	0.06212	-0.19220
21	-0.64424	-0.32317	-0.63508	-0.31245	-0.30292	-0.54011	-0.02557	-0.22334	-0.37846	-0.05946	-0.12669	0.03122	0.30019
22	-0.56515	-0.27508	-0.59643	-0.26918	-0.28060	-0.52003	0.01090	[illegible]	-0.44210	-0.06387	-0.16978	0.02325	0.24954
23	-0.46521	-0.16904	-0.35721	-0.11965	-0.12090	[illegible]	-0.02784	[illegible]	-0.13005	0.07073	0.30477	0.04257	0.28987
24	-0.59082	-0.25018	-0.58366	-0.23961	-0.30264	-0.51066	-0.00583	-0.10087	-0.44205	-0.00759	-0.08675	0.05621	0.31392
25	-0.62062	-0.28775	-0.60703	-0.25580	-0.33830	-0.53052	-0.04416	-0.10952	-0.41432	0.01379	-0.13564	0.03673	0.30059
26	-0.63320	-0.31754	-0.62823	-0-29843	-0.35015	-0.54802	-0.04203	-0.15450	-0.33275	-0.03042	-0.16742	0.03821	0.31959
27	-0.61024	-0.26318	-0.60540	-0.26756	-0.35620	-0.53800	-0.02676	-0.10534	-0.42907	-0.03671	-0.14850	0.05412	0.34144
28	-0.54653	-0.23083	-0.44800	-0.15853	-0.21619	-0.10465	-0.00120	0.16956	-0.15447	0.01173	0.02176	0.01589	0.32014
29	-0.59267	-0.28936	-0.60526	-0.25612	-0.29034	-0.43492	0.12620	-0.15454	-0.39420	-0.05367	-0.19845	0.01022	0.29599

*See pages 135 and 136 for code.

16	17	18	19	20	21	22	23	24	25	26	27	28	29
1.00000													
-0.02120	1.00000												
0.22851	-0.01409	1.00000											
0.44326	0.26975	0.34840	1.00000										
-0.00032	0.25340	0.68335	0.20435	1.00000									
0.24319	0.26116	-0.48257	0.21749	-0.50716	1.00000								
0.13915	0.13332	-0.53268	0.06515	-0.62868	0.96385	1.00000							
0.11109	0.24148	-0.08882	0.09707	-0.38475	0.55717	0.53352	1.00000						
0.24927	0.22908	-0.52347	0.18091	-0.58092	0.98399	0.96895	0.56744	1.00000					
0.26241	0.24975	-0.48867	0.21930	-0.54963	0.98268	0.95696	0.55624	0.98598	1.00000				
0.26659	0.23610	-0.46822	0.20791	-0.52315	0.99178	0.97100	0.54769	0.98493	0.99217	1.00000			
0.25752	0.19808	-0.47674	0.18163	-0.54139	0.98541	0.97609	0.54448	0.98326	0.97768	0.99194	1.00000		
0.11547	0.27819	-0.09898	0.06956	-0.35381	0.62672	0.52777	0.37491	0.61992	0.61921	0.62099	0.61624	1.00000	
0.19547	0.11642	-0.49008	0.06954	-0.58863	0.96413	0.98958	0.51688	0.96133	0.95609	0.97226	0.97314	0.59801	1.00000