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A COMPARISON OF BRIEF RELAXATION THERAPIES:
SELF-REPORT AND PHYSIOLOGICAL INDICES

By

Rodney K. Miller

B.S., Montana State University, 1971

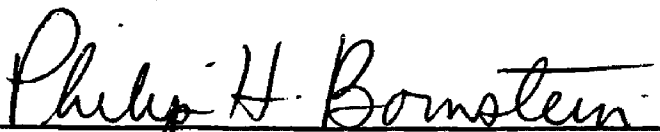
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Psychology

A Comparison of Brief Relaxation Therapies: Self-Report and Physiological Indices (102 pp.)

Director: Philip H. Bornstein

PHB

The present investigation was undertaken in an attempt to answer four major questions. First, could a brief relaxation procedure achieve significant degrees of relaxation efficiently? Second, what type of technique would be most effective in a brief application? Third, could a cognitive relaxation procedure work just as effectively as a deep-muscle procedure? Finally, would music paired with relaxation instructions enhance the relaxation process?

Eighty subjects were recruited to participate in a 30 minute relaxation training procedure. Subjects were randomly assigned to either progressive relaxation, intermediate relaxation, mental relaxation, or self-relaxation conditions. In addition, half of the subjects in each condition received music paired with the relaxation instructions. All relaxation procedures were presented via audio tape. Relaxation effects were assessed by measuring pre- to post-treatment change on self-report inventories and EMG measurements; subjects also completed a post-experimental questionnaire.

Results indicated that all relaxation conditions resulted in highly significant change in the relaxed direction on EMG measurements and a state anxiety inventory. However, there were no differences between any of the conditions in bringing about this change. Formal relaxation procedures were no more effective than simply having subjects relax themselves. The results do indicate that a brief procedure can be highly effective and they also indicate that a cognitive procedure can be just as effective as a deep-muscle procedure in a brief application. The results do not indicate which type of procedure would work best in a brief application and the results fail to show that music contributes to the relaxation process.

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CHAPTER I

INTRODUCTION

Historical Overview

The pioneering work in relaxation training as a specific treatment technique was begun by Edmund Jacobson shortly after the turn of the century. Working within the frameworks of physiology and medicine, he discovered that the emotional reaction of anxiety was marked by tension patterns in the smooth and striated muscles. He thus decided that excessive tension could be regulated or avoided through the voluntary musculature. As a result of these findings, Jacobson concluded that the appropriate treatment for anxious individuals was to teach them to completely relax muscle fibers. This was accomplished by having the individual systematically tense and release various muscle groups, attend to and discriminate between the sensations of tension and relaxation, and thus learn to eliminate muscle contractions. This then was the technique of progressive relaxation training developed by Jacobson and presented in various books and journal articles beginning in 1920 and continuing until his most recent work Anxiety and Tension Control (1964).

As Jacobson's work was primarily in the field of medicine, his techniques were not utilized to any large extent

by psychologists for a great many years. ~~★~~ It was Joseph Wolpe who was primarily responsible for introducing relaxation training into the realm of psychology. In his work on the counterconditioning of fear responses, he discovered relaxation as an effective incompatible response in human subjects. Borrowing from Jacobson's technique, he made several modifications of the relaxation procedures primarily for the purposes of shortening the training program and increasing its efficiency. Thus relaxation training became an important component of Wolpe's counterconditioning program and was formally presented, in its modified form, in his book, Psychotherapy by Reciprocal Inhibition (1958).

~~★~~ From this point in time, the historical development of relaxation training closely paralleled the development of the technique of systematic desensitization. Relaxation was primarily utilized as the anxiety inhibiting component in desensitization programs, and considerably less application of it as a technique in its own right has occurred. This is clearly illustrated by reviewing the literature where much research has concentrated on relaxation as a component in desensitization packages (e.g., Cooke, 1968; Davison, 1968; Folkins, Evans, Opton, & Lazarus, 1968; Gershman & Clouser, 1974; Laxer & Walker, 1970; Lomont & Edwards, 1967; Marshall, Strawbridge & Keltner, 1972;

Rachman, 1967, 1968; Wolpe & Flood, 1970; Zeisset, 1968; to name only a few). Some notable exceptions do occur, however, and research on relaxation as a specific technique has become increasingly evident in recent years. The clearest evidence for the recognition of relaxation training as a treatment in its own right is the recent book by Bernstein and Borkovec, Progressive Relaxation Training: A Manual for the Helping Professions (1973). In this work, the authors present relaxation as a specific treatment for such problems as insomnia, tension headache, general anxiety, and poor therapy communication to name only a few. However, they explicitly state that research on relaxation training as a specific treatment technique is definitely lacking. Thus it can be seen that widespread recognition of relaxation techniques as separate treatment procedures is relatively recent and much research and investigation is still necessary.

Research on Relaxation Training

As previously mentioned, much research emphasis has concentrated on relaxation as a component in desensitization programs. There has been considerable controversy as to whether relaxation is an essential component of the desensitization procedure and attempts to answer this question have stimulated considerable research. Evidence to support the contention that relaxation may not be necessary has come from Cooke (1968), Crowder and Thornton (1970), Aponte and Aponte

(1971), and Walters, McDonald, and Koresko (1972). These studies achieved successful results using a desensitization technique that did not have a relaxation component. However, studies by Laxer and Walker (1970), Lomont and Edwards (1967), Rachman (1965), Davison (1965, 1968), and Wolpe and Flood (1970) indicate that relaxation is a necessary component in successful desensitization programs. It becomes readily apparent that this issue is quite complex and a definitive answer is not currently available. At present it appears that the importance of relaxation may vary with the type of anxiety exhibited by the client, but that it does have at least enhancing effects in almost all situations (Miller & Nawas, 1970; McGlynn, 1973; O'Leary & Wilson, 1975). Beyond this issue, certain other studies have also looked at various aspects of relaxation training as a component in desensitization programs (Folkins et al., 1968; Marshall et al., 1972; Rachman, 1967, 1968):

Several authors have attempted to assess the therapeutic effect of relaxation alone in comparison with some type of desensitization procedure. Freeling and Shemberg (1970) compared relaxation versus desensitization in the treatment of test anxiety and found differences in favor of desensitization on self-report questionnaires but no differences on behavioral comparisons. Gershman and Clouser (1974) found no differences between desensitization and relaxation in treating insomnia. Relaxation and desensitization were also

found equally effective in decreasing the interview anxiety of psychiatric patients in a study done by Zeisset (1968).

Relaxation training has been utilized as a specific treatment technique in a variety of situations. Budzynski, Stoyva, and Adler (1970) utilized a "feedback induced" relaxation technique to successfully treat tension-headache. Epstein, Hersen, and Hemphill (1974) used a similar technique to also treat chronic tension-headache but reported difficulty in maintaining success when subjects no longer received feedback during relaxation. Haynes, Woodward, Moran, and Alexander (1974) and Kahn, Baker, and Weiss (1968) reported the successful treatment of insomnia by relaxation training. Test anxiety has been decreased through the use of relaxation in studies done by Laxer and Walker (1970) and Russell and Sipich (1974). Davidson and Hiebert (1971) and Paul (1969) were able to decrease stress reactions by teaching subjects relaxation training prior to exposure to stressful stimuli. In an early use of relaxation techniques, Pascal (1949) demonstrated their effectiveness in enhancing recall of verbal material. Similar results for high anxious subjects were also obtained by Straughan and Dufort (1969), but they found relaxation hindered the performance of low anxious subjects. Dysmenorrhea was successfully treated with a combination of relaxation and imagery by Tasto and Chesney (1974). Johnson and Spielberger (1968) reported that relaxation training was effective in reducing state but not

trait anxiety. Relaxation was taught as a behavioral self-management skill to subjects by Sherman and Plummer (1973) who report that their subjects seemed to have learned a "useful skill."

The literature also contains reports of research aimed at demonstrating the general effectiveness of relaxation procedures without applying them to a specific problem. The work of Paul (1969) fits in this category. He demonstrated that relaxation training was superior to hypnotic suggestion in decreasing subjective tension (anxiety questionnaire) and physiological arousal in 60 unselected subjects. Beary and Benson (1974) demonstrated the effectiveness of a new relaxation technique using physiological indices (O₂ consumption, CO₂ production, and respiratory rate). Brady (1973) reported on a new procedure he developed known as "metronome conditioned relaxation" which he claims has proven quite effective. Lader and Mathews (1970) also utilized physiological indices (blood flow, heart rate, GSR, and EMG) and scale data to assess the effectiveness of relaxation training as compared with drug injection or listening to a tape of "neutral content." They report no differences between their groups and question both the effectiveness of physiological measures at low arousal levels and the utility of short treatment procedures. Yorkston and Sergeant (1969) reported on a technique they devised which they claim achieves relaxation in two minutes; however, their data primarily consisted of uncon-

trolled observations and is more anecdotal than scientific in nature.

Relaxation training is also utilized in certain variations of the basic desensitization program formulated by Wolpe (1958, 1969). It is the anxiety inhibiting agent in group desensitization (Lazarus, 1961) and in certain forms of in-vivo desensitization for example. Lastly, relaxation is a component of certain procedures stemming from the behavioral technique of flooding, two examples of which are covert sensitization (Cautela, 1966, 1967) and induced-anxiety (Bornstein & Sippelle, 1973).

The above mentioned studies clearly illustrate that relaxation training is an important and valuable behavioral technique with a wide range of applications. It would indeed be difficult to challenge the assertion that it can be a highly useful tool in the hands of the well-trained clinician.

Types of Relaxation Procedures

Before launching on a discussion of the various types of relaxation procedures, it is necessary, for the sake of clarity, to define what is meant by "progressive relaxation." "Progressive relaxation" was the term originally coined by Jacobson to describe the technique he devised. It is a procedure intended to achieve relaxation of the peripheral muscles through the use of systematic muscular tension-release cycles. Its sole goal is to achieve a general state

of muscular relaxation throughout the body, and it is assumed that this state of relaxation will have anxiety inhibiting or decreasing properties. Wolpe (1958) revised Jacobson's technique, primarily for the purpose of shortening it, and it is Wolpe's procedure that has been most influential in psychological applications of relaxation. Through the years, Wolpe's procedures have also been modified in a variety of ways, but all modifications of Wolpean procedures still utilize tension-release cycles to achieve relaxation of peripheral body muscles. Thus progressive relaxation has become a generic term for techniques utilizing systematic tension-release cycles. Deep-muscle relaxation is also used to describe these techniques by several authors, and in the remainder of this paper the two terms will be used interchangeably. Thus when the terms progressive or deep-muscle relaxation are used, they refer to techniques aimed at achieving muscular relaxation through tension-release cycles, techniques ultimately stemming from the original work done by Jacobson.

With this definition in mind it is now possible to proceed to a consideration of various types of relaxation procedures. As one reviews the literature on relaxation training, it becomes readily apparent that the most widely used and researched type is progressive or deep-muscle relaxation. In fact, surveying the literature one could easily get the impression that the term relaxation training is synonymous

with the progressive type. Marquis, Morgan, and Piaget (1973) in their systematic desensitization manual stated that the traditional counterconditioning response to use is deep-muscle relaxation. They made no mention of any other potential relaxation technique that could be used. Bernstein and Borkovec's (1973) manual also dealt exclusively with progressive (deep-muscle) relaxation and only briefly mentioned other techniques in reviewing certain studies. A review of the relaxation research presented in various journals lends further support to the contention that progressive relaxation is by far the most heavily researched type (Budzynski et al., 1970; Cooke, 1968; Davidson & Hiebert, 1971; Epstein et al., 1974; Freeling & Shemberg, 1970; Gershman & Clouser, 1974; Haynes et al., 1974; Johnson & Spielberger, 1968; Lader & Mathews, 1970; Laxer & Walker, 1970; Lomont & Edwards, 1970; Paul, 1966, 1969a, 1969b; Paul & Trimble, 1970; Rachman, 1965; Sherman & Plummer, 1973; Wolpe & Flood, 1970; Zeisset, 1968).

There are, however, other techniques which have been utilized with reported success. An early example is the work of Pascal (1949) in which he utilizes suggestions of the muscles relaxing and loosening, suggestions of the pleasant sensations spreading from the toes to the top of the head, and deep breathing. This technique was also used by Straughan and Dufort (1969) with good results. Autogenic training, which consists of a series of trials

in which passive concentration on parts of the body becoming warm and heavy is practiced, is another relaxation procedure reported in the literature (Kahn et al., 1968). Borrowing from Eastern meditation approaches, Beary and Benson (1974) devised a new relaxation technique which was found effective using physiological measurements. This technique required subjects to sit quietly in a comfortable position, close their eyes, deeply relax all muscles (without instructions as to how to accomplish this), say "one" with each exhalation, ignore distracting thoughts and maintain a passive attitude. Marshall, Strawbridge, and Keltner (1972) utilized instructions to feel calm and relaxed alternated with imagining a pleasant scene as the relaxation component in a desensitization program with good results. Yorkston and Sergeant (1969) reported a procedure that takes only about two minutes and consists of monotonously repeating a series of statements such as "let your toes (pause for one breath)--relax" with 25 different body parts covered by the statements. Although they reported outstanding results, the research was uncontrolled, and massive possibility for confounding exists.

Arnold Lazarus has also developed a relaxation procedure which departs from the standard deep-muscle type. In his book Behavior Therapy and Beyond (1971), he presented some general relaxation instructions (appendix C) which incorporate minimal tension-relaxation as well as instruc-

tions similar to those of Pascal (1949). Lazarus has the individual tense all of their muscles and relax them just once. Then he utilizes suggestions of the various body parts relaxing and the pleasant sensations spreading from the head to the toes. He also utilizes breathing exercises and the pairing of a cue word (e.g., calm, relaxed) to the relaxed sensations. Although this specific technique has not been used in a controlled study, it is appealing and does appear to hold promise.

There has also been research on variations of standard progressive relaxation. Brady (1973) reported a technique he devised called metronome conditioned relaxation. This procedure consists of training in deep-muscle relaxation (using eight major muscle groups), suggestions of physical and psychological relaxation, and pairing the statements "re-lax" and "let-go" with a metronome set at 60 beats per minute. Russell and Sipich (1974) utilized cue-controlled relaxation in a case study. This technique consists of training in deep-muscle relaxation and pairing a cue word (e.g., calm, relaxed) with the relaxed state. Another procedure, known as differential relaxation (Bernstein & Borokov, 1973, p. 39) involves training in deep-muscle relaxation and then further training in relaxing only specific groups of muscles during various types of activities. It must again be stressed, however, that the three above-mentioned techniques still require deep-muscle relaxation

in their initial phases and then add on extra components to the basic procedure.

Two further variations of progressive relaxation which include mental relaxation components are also reported in the literature. Rimm and Masters, in their book Behavior Therapy: Techniques and Empirical Findings (1974), advocated using imagery and suggestions of a "wave" of "warm, comfortable, pleasant relaxation" as a deepening technique (pp. 50-51). It must be stressed that this is only a deepening technique, and their primary emphasis is still on training in standard progressive relaxation. A technique reported by Tasto and Chesney (1974) in treating menstrual cramps also combines mental imagery with deep-muscle relaxation. These authors trained their subjects in standard deep-muscle relaxation for two sessions, had them relax and imagine neutral scenes in the third session, and finally in the fourth and fifth sessions had them relax and imagine scenes associated with menstrual pain reduction. Although both of the above-mentioned studies utilize muscular relaxation in their primary phases, they can be viewed as approaching what could be called a more "intermediate" relaxation procedure, that is a procedure which combines both muscular and mental relaxation components.

In conclusion, it can be seen that research and application has primarily concentrated on progressive or deep-muscle types of relaxation procedures. There is evidence

though that techniques utilizing approaches other than muscular tension-release cycles can be applied with success in many situations. In view of this fact, one begins to wonder why some of these other techniques have not received more attention. The assumption of many authors seems to be that deep-muscle relaxation is the most efficacious type, but this assumption is not necessarily supported by the empirical evidence currently available.

Muscular Versus Mental Relaxation

The central proposition underlying progressive relaxation training is that in order for an individual to achieve a state of general relaxation he must first relax his peripheral muscles. This is why the tension-release cycles are the primary component of this type of relaxation procedure. There is, however, evidence that peripheral muscle relaxation is not necessary to achieve a general state of relaxation. The alternative view that it is the mental or cognitive state of relaxation or calm that is the essential ingredient has been suggested and supported by certain research evidence.

Davison (1966a) reviewed several studies of fear conditioning in curare paralyzed animals and concluded that evidence challenged the assertions of Jacobson and Wolpe that peripheral muscular relaxation was the essential condition for achieving general relaxation. He offered, as one possible hypothesis, that relaxation or similar techniques can

result in "strong positive affect states" and that it is these states which are incompatible with anxiety.

Rachman (1968) changed his earlier (1967) view on the importance of muscular relaxation as essential to successful desensitization after noting the successes of other techniques. He came to the conclusion that mental relaxation was the essential factor and that peripheral muscular relaxation was not essential. In an attempt to support Rachman's conclusion, Marshall, Strawbridge, and Keltner (1972) conducted research comparing muscular relaxation with relaxation consisting of instructions to feel calm and relaxed alternated with imagining a pleasant scene. These two approaches were compared as components in a desensitization program, and both were found to be equally effective. They thus supported Rachman's conclusions and made the further point that the imaginal approach can save time and tedium.

Thus the necessity of using muscular relaxation can be brought into serious question in light of the above findings. It may well be that an easier, simpler, more efficient technique can be found that will be as effective or even more effective than the standard muscular variety. However, empirical research is required. Relaxation techniques in the above-mentioned articles were compared as components in a desensitization program and not as treatments in their own right. Research comparing different

relaxation procedures as specific treatment approaches is absent from the literature.

Toward a Brief Procedure

One of the chief objections to standard progressive relaxation training is that it can be quite time consuming. The procedure described by Bernstein and Borkovec (1973) takes approximately 10 sessions to complete, and the original technique developed by Jacobson requires up to 56 sessions. While the Bernstein and Borkovec procedure is undoubtedly worth the time investment when therapeutic needs are met solely by utilizing relaxation, there are times when relaxation is needed strictly as an adjunct to other types of therapy. It is at these times when the clinician cannot afford to spend as many as 10 sessions engaging in relaxation training.

The potential uses for relaxation as an adjunct to other therapies are undoubtedly numerous and varied. One example that comes immediately to mind is its use to facilitate therapy communication and progress. When a clinician is dealing with a highly tense or anxious individual, there is a high probability that the anxiety can interfere with the on-going course of therapy. The interference could take such forms as inability to "open-up" on certain topics, poor attention, poor concentration, and numerous other secondary effects of high anxiety. Granting that verbal

therapy is a form of learning, the studies of Straughan and Dufort (1969) and Pascal (1949) lend further support to the efficacy of relaxation as a therapy enhancer. These two studies demonstrated that verbal learning and recall are improved in high anxiety individuals when these individuals are given relaxation training. Pertinent to this discussion is also the following quote taken from Bernstein and Borkovec's (1973) relaxation manual:

Secondly, any verbal learning that takes place during traditional verbal therapy is likely to be influenced by the anxiety level of the client and by the extent to which the therapist provides a comfortable atmosphere by using relaxation or in some other way. (P. 7)

Many clinicians are also undoubtedly faced with clients who suffer uncomfortable anxiety levels as a secondary result of some other more basic problem. While therapy may be focused on the client's primary problem, the therapist may also wish to give his client more immediate relief from anxiety by teaching him relaxation skills. Thus, the client can learn an anxiety relieving coping skill, experience some immediate therapeutic benefit, and quite probably work more efficiently on his primary problem. Again relaxation could be a useful adjunct to other forms of therapeutic intervention provided the training could be quickly and efficiently done so as to not interfere with the continuity of on-going therapy.

The two above-mentioned examples illustrate the poten-

tially tremendous value of relaxation training as an adjunct to other forms of therapy. Its use as a therapy enhancer and facilitator as well as a secondary therapeutic intervention procedure make it applicable to a wide range of situations, but there are also many possible uses for relaxation beyond the two examples mentioned. Indeed, the value of relaxation skills in the hands of the practicing clinician would be many and varied.

Beyond its use as a therapy adjunct, a brief relaxation procedure could also be utilized for many of the same purposes as longer procedures are now used. Certainly using longer procedures when equally effective shorter ones are available is a waste of time, effort, and energy. An article by Ince (1970) clearly illustrated these points. Addressing himself to the issue of length of time required for relaxation, he stated that it is an important variable for two reasons. First, since behavior therapies consider their briefer time required for symptom relief a superior asset, speed of therapy should be an important goal. Secondly, "patient variables" such as treatment length, sessions per week, and cost must be taken into consideration. Thus, if an effective brief procedure can be demonstrated, its use in systematic desensitization, covert sensitization, and other programs requiring relaxation training would certainly seem logical.

The above discussion highlights the need for an effec-

tive brief relaxation technique which can be readily used as a therapy adjunct and as a possible substitute for longer procedures currently in use. Deep-muscle relaxation has been modified to a considerably shortened version, and research indicates that it can be effective in this form (Paul, 1966, 1969a, 1969b). However, it was not compared with other relaxation procedures, thus its superiority over other procedures is yet to be demonstrated. The relaxation procedure devised by Lazarus (1971) is also of a brief nature, as are the procedures utilized by Pascal (1949), Beary and Benson (1974), Marshall et al. (1972), and Yorkston and Sergeant (1969). However, controlled research directly evaluating and comparing these approaches as specific techniques is absent from the literature. This would certainly seem to be an important area where research needs to be done.

Music and Relaxation

One other area in which research is apparently lacking is the role of music in increasing the effectiveness of relaxation procedures. Music is recognized by many as having relaxing qualities in its own right, but no controlled research pairing it with a relaxation technique is evident in the literature.

That music may be a valuable asset when utilized with behavioral approaches is illustrated by the following articles. Madsen and Madsen (1968) used music lessons and play-

ing as a reinforcement in the modification of acting out in a 15-year-old delinquent. They further had the boy and his mother listen to and discuss some of his favorite records together. They were able to extend periods of social interaction between the two with this approach, and they stated that responses resulting from listening to and relaxing with music were antagonistic to the intense emotional reactions that had characterized previous interactions. [The authors go on to state that this approach had elements characteristic of "desensitization," but it must be recognized that this was an uncontrolled case study and thus no direct conclusions can be drawn. Lang (1969) cited research by Grossberg which found no differences in physiological arousal level between subjects trained in a brief relaxation procedure and subjects that simply listened to music. Madsen, Cotter, and Madsen (1968) talked about the role of music therapy as a scientific approach and its utilization in behavior modification and therapy. They urged careful, scientific research evaluating the role of music in controlled settings and the resultant incorporation of music into the body of behavioral techniques. They explicitly stated, "We may find that music is capable of much more than we previously considered possible."] Despite the very sensible urgings of these authors, hardly anyone has taken their advice as of this time. The literature contains virtually no references to the pairing of music with behavioral tech-

niques such as relaxation. This would seem a very fruitful endeavor, and one wonders why such a potentially valuable area of research has been practically ignored.

Purposes of This Research

In view of all that has been said in the forgoing sections, it becomes apparent that there are several questions which can possibly be answered by appropriate research. It is the intention of this research to provide some of these answers and attempt to fill in some gaps in current knowledge. Specifically, the questions in need of answer are: (a) what type of relaxation procedure is most efficient in a brief training program, (b) can a technique utilizing mental or "cognitive" means of achieving relaxation be just as effective (or more so) than a deep-muscle technique, (c) can a brief procedure achieve significant degrees of relaxation efficiently, and (d) can music paired with relaxation instructions enhance the process?

Thus it is the purpose of this research to provide some answers to the above questions by the following means. First of all, three relaxation techniques of 30 minutes duration will be devised to meet the need for a brief procedure and their effectiveness will be assessed against a control group via physiological and questionnaire data. Secondly, the three techniques will consist of a progressive (deep-muscle) procedure, a more cognitive or mentally

oriented procedure, and an intermediate procedure. Third, in half of the presentations of each procedure music will be paired with the relaxation instructions in order to assess if it has enhancing qualities.

It is felt that this research represents a significant potential gain to current knowledge. Variables that have not yet been researched or compared in a controlled manner can be assessed and conclusions at least tentatively drawn. This will not only answer empirical questions but also contribute pragmatic knowledge where such knowledge is needed.

CHAPTER II

METHOD

Subjects

A total of 80 subjects (53 females and 27 males) participated in the experiment with 10 subjects assigned to each of eight experimental conditions. Subjects were solicited via newspaper advertisements offering free relaxation training. Interested individuals were instructed to call the Clinical Psychology Center and, upon calling, their names and phone numbers were taken by the clinic secretary. The author then recontacted each prospective subject, answered any questions, and scheduled each interested party for an individual appointment. Appointments were scheduled either on weekday evenings (after 5 p.m.) or on weekend afternoons. Once a subject had been scheduled for an appointment, he/she was then randomly assigned to one of the eight experimental conditions.

Although subjects were not screened prior to participation nor was specific demographic data obtained, some information was gathered from the participating subjects during conversation with the experimenter. All subjects were asked if they had had previous relaxation training to which all

responded in the negative. While specific data is not available, conversations with the subjects also revealed that the majority were college students but that several were either university staff, spouses of students, or townspeople that had either heard of the program or had seen an advertisement. Observations and conversations clearly revealed that the sample was quite heterogeneous in many respects.

Dependent Variables

Effectiveness of the experimental procedures was assessed via a physiological measure, responses to two anxiety scales, and responses to a post-experimental questionnaire. Physiological data consisted of electromyograph (EMG) readings from the right forearm extensor. The anxiety scales utilized were the Taylor Manifest Anxiety Scale (Taylor, 1953) and the State-Trait Anxiety Inventory (Spielberger, Gorsuch, & Lushene, 1970). As both of these scales were used as pre-post measures for a very brief treatment (30 minutes) it was considered necessary to modify their standard form. A test-retest period this short was felt to create a high probability of response bias and demand characteristics which would introduce considerable error into the data. Thus to protect against this possibility, the Taylor Manifest Anxiety Scale (TMAS), the state portion of the State-Trait Anxiety Inventory (STAI), and the trait portion of the STAI were each split into two parallel forms with one form of each admin-

istered for pre-treatment assessment and the other form of each for post-treatment assessment. For the STAI this was accomplished by randomly assigning half of the state items and half of the trait items into their respective pretest forms and the other half of the items from each into their respective posttest forms. For the TMAS a slightly different procedure was necessitated by the fact that the social desirability ratings of affirmative responses to the items vary. Thus, the procedure utilized here was to pair the items on the basis of their "favorability ratings" (Dahlstrom & Welsh, 1960, appendix F) and randomly assign the members of each pair to either the pre- or posttest form. The post-experimental questionnaire was constructed by the author. Copies of the anxiety scales and the post-experimental questionnaire are contained in appendix A.

Procedure

Subjects came individually for their scheduled hour and were met on arrival by an experimenter. The experimenter escorted each subject to a private room and at this time gave the subject the pre-treatment anxiety scales to complete. Upon completion of the scales, the subject was then escorted to the experimental room and seated in a recliner chair. The experimenter then related the standard introduction to the subjects in conditions I, II, III, IV, V, and VI (see appendix B). Subjects in conditions VII and VIII

received a different introductory statement (see appendix B).

After the introductory statement, the experimenter then attached the subject to the physiological monitoring device. After the hook-up procedure, the experimenter then explained to the subject that he would be leaving the room and that if the subject had any questions they must be asked at that time. After answering any questions, the experimenter then instructed the subject to sit quietly for the next few minutes until the actual relaxation instructions began. At this time the experimenter left the subject's room and entered the control room next door. The control room contained the physiological monitoring device and the tape recorder for presenting the relaxation instructions. Upon entering the control room, the experimenter then began timing for five minutes. After five minutes passed, the experimenter then recorded the next 60 seconds of EMG activity which served as the pretreatment physiological data.

At the end of the 60-second data recording period, the experimenter then activated the tape recorder for subjects in the relaxation conditions or gave the signal for subjects in the self-relaxation control groups. Subjects in relaxation conditions were presented their relaxation instructions for the next 30 minutes, subjects in the first control group (self-relaxation) were allowed to self-relax for the next 30

minutes, and subjects in the second control group (self-relaxation with music) self-relaxed and listened to music for the next 30 minutes. At the completion of the experimental procedure, the next 60 seconds of physiological activity were recorded which served as posttreatment data. After this data was recorded, the experimenter then re-entered the experimental room, informed the subject that the procedure was completed, and detached the monitoring hook-ups. The subject was then returned to the private room at which time the posttreatment anxiety scales were administered and the post-experimental questionnaire was completed. The subject was then thanked for his/her assistance and cooperation, any questions about the experiment were answered, and the subject was debriefed as to the purposes of the experiment. In addition, further relaxation training was offered to anyone interested in participating.

Experimental Conditions

The following are brief descriptions of each of the eight experimental conditions utilized in this study. In conditions in which relaxation instructions were presented, this was accomplished via a 30-minute audio tape consisting of an introductory statement and all instructions. The tapes were made by the author and recorded in his voice. All tapes were broadcast over a stereophonic loudspeaker system with relaxation instructions broadcast from the right speaker and music, when used, from the left speaker. A script of the introductory statement and actual instruc-

tions for each of the relaxation procedures is contained in appendix C.

I. Progressive relaxation (PR). The relaxation procedure utilized in this condition was essentially the same technique used in the research of Paul (1966, 1969a, 1969b). This is a progressive or deep-muscle relaxation procedure adapted from the work of Wolpe and achieves relaxation strictly through the use of muscular tension-release cycles. Since this procedure had been experimentally demonstrated to be effective in previous research, it was utilized in this study in as unaltered a form as possible in all aspects. The only alterations were those necessitated by presenting the instructions via audio tape rather than in-vivo. These alterations consisted of (1) requiring two tension-release cycles per muscle group whereas Paul allowed up to four, if necessary, and for certain groups as few as one depending on feedback from the subject, and (2) eliminating the possibility of returning to a particular muscle group contingent on the subject's feedback. In all other aspects, the procedure was identical to that used by Paul.

II. Progressive relaxation with music (PRM). This experimental condition was identical to the PR condition except that the relaxation instructions were accompanied by background music. The music was at a volume below that of the instructions so as to not hinder the subject's ability

to clearly hear them. The music consisted of a variety of classical and semi-classical selections played by an orchestra string section.

III. Intermediate relaxation (IR). The relaxation procedure used in this condition consisted of both deep-muscle techniques and mental relaxation techniques. The idea for an intermediate relaxation procedure was suggested by the work of Rimm and Masters (1974, pp. 50-51). These authors advocated using standard progressive relaxation techniques for achieving the initial stages of relaxation and then utilizing mental relaxation techniques as "deepening" procedures. While the actual relaxation techniques used by Rimm and Masters were not used in this condition, their idea of combining muscular and mental approaches was used.

The Intermediate Relaxation procedure consisted of two equal phases. The first phase was the deep-muscle component and consisted of muscular tension-release cycles involving seven major muscle groups with each group being tensed and released twice. The second phase was the mental relaxation component. Mental relaxation was accomplished by presenting the subject with imagery of a "relaxation scene." The subject was instructed to imagine a mountain meadow with green grass, blue sky, warm sun, a flowing brook, and so forth, with additional suggestions of peace, calm, tranquility, and relaxation. This mental relaxation component was iden-

tical to the second half of the procedure used in the Mental Relaxation condition (section V following).

IV. Intermediate relaxation with music (IRM). This experimental condition was identical to the IR condition except that the relaxation instructions were accompanied by background music. The background music was the same as utilized in the PRM procedure.

V. Mental relaxation (MR). The relaxation procedure in this condition utilized only suggestions and imagery to accomplish relaxation. All of its elements were "cognitive" in nature, and no tension-release cycles or other muscular movements were incorporated into it. Although the actual instructions were devised by the author, it was primarily an expansion and refinement of Rimm and Masters' (1974) "deepening" technique as well as the technique utilized by Pascal (1949).

Relaxation was accomplished by instructing the subject to imagine his/her body being bathed in a warm, pleasant fluid which allows one to relax and release all feelings of tightness and tension. Suggestions of the fluid moving up the body from the toes eventually to the head in pleasant "waves" of relaxation were given. Additional suggestions of warmth, heaviness, calm, lack of tension, and so forth were interspersed with the wave suggestions. After the subject was relaxed to the head, in the above manner,

imagery of a "relaxation scene" was presented. This was accomplished by instructing the subject to imagine a mountain meadow with green grass, blue sky, warm sun, a flowing brook, and so forth. Interspersed with this imagery were further suggestions of peace, calm, tranquility, and relaxation.

VI. Mental relaxation with music (MRM). This condition was identical with the MR condition except that the relaxation instructions were accompanied by background music. The music was the same as that utilized in the PRM and IRM conditions.

VII. Self-relaxation (SR). This condition served as one of the control groups. These subjects were simply told to sit quietly in the recliner, close their eyes, and attempt to relax by personally effective means until further instructed. The importance of remaining awake and getting as relaxed as possible were stressed. These subjects were told to begin relaxing when signaled and after the signal, were allowed to continue relaxing for 30 minutes, at which time the experimenter entered the room and terminated the session.

VIII. Self-relaxation with music (SRM). This condition served as a music-only control group. Subjects received instructions and treatment identical to the subjects in the SR group with the exception that while these subjects self-

relaxed, low-volume music was played. The music was identical to that utilized in the other music conditions. The experimenter made no reference to the music in his introductory statement; it was simply turned on after the subject was instructed to begin relaxing. The music was played for the entire 30 minutes of the session.

Experimental Setting

All subjects were placed in a small room equipped with a recliner chair, a small table with a lamp, and two stereophonic loudspeakers. Upon entering the room, the subject was seated in the recliner chair and was instructed to sit back in a reclined position. The subject was further instructed to get and remain as comfortable as possible and to remain in a reclined position at all times. The chair was positioned next to the wall separating the experimental room from the control room and the EMG electrodes entered the subject's room from a small hole in the wall and extended to the arm of the recliner chair. The stereo speakers were placed on shelves behind and slightly above the subject. Upon leaving the experimental room, the experimenter switched off the overhead light leaving a small table lamp on which was positioned behind the subject to his/her left. The door to the experimental room was closed and a quiet atmosphere was maintained to enhance the relaxation effects. All equipment was located in the adjacent experimenter's room,

and the subject was left alone for the duration of the experimental procedure.

Apparatus

Muscle tension was recorded from the right forearm extensor. Silver/silver-chloride cup electrodes, filled with biopotential contact medium, were attached over the muscle site with adhesive disks. The signal was fed into an Autogenic Systems, Inc. Autogen 1500b feedback myograph which constantly measured muscular tension in microvolts. To accomplish data collection, the signal from the feedback myograph was fed into an Autogenic Systems, Inc. Autogen 5100 digital integrator. This machine measured the average amplitude of EMG activity over the 60-second pre- and posttreatment data collection periods and displayed the results at the end of each period via a digital readout. The experimenter recorded the digital readings for each subject on the subject's data card.

CHAPTER III

RESULTS

One-way analyses of variance were performed on all pre-treatment data to check the adequacy of the randomization procedure and discover if all groups had been equated prior to administering treatment. Each analysis was composed of eight groups (PRM, PR, IRM, IR, MRM, MR, SRM, and SR) with an n of 10 per group (total $n=80$). The results of these analyses follow. Analysis of the State pre-test data indicated no significant between-groups differences [$F(7, 72) = .721, p > .10$]. Analysis of the Trait pre-test data indicated no significant between-groups differences [$F(7, 72) = 1.734, p > .10$]. Analysis of the Taylor Manifest pre-test data also indicated no significant between-groups differences [$F(7, 72) = 2.097, p > .05$]. Analysis of the EMG pre-treatment data indicated nonhomogeneity of variance ($F_{\max} = 58.96, p < .01$) between the groups thus necessitating a transformation of the data prior to conducting further analyses. This data was subsequently transformed using a log (base 10) transformation which resulted in homogeneity of variance ($F_{\max} = 6.12, p > .05$). A one-way ANOVA was then performed on the transformed pre-treatment data and the results indicated that there were again no significant between-groups

differences [$F(7, 72) = .504, p > .10$]. Thus, the results of the above analyses indicate that randomization was adequate and that all groups were equated prior to treatment.

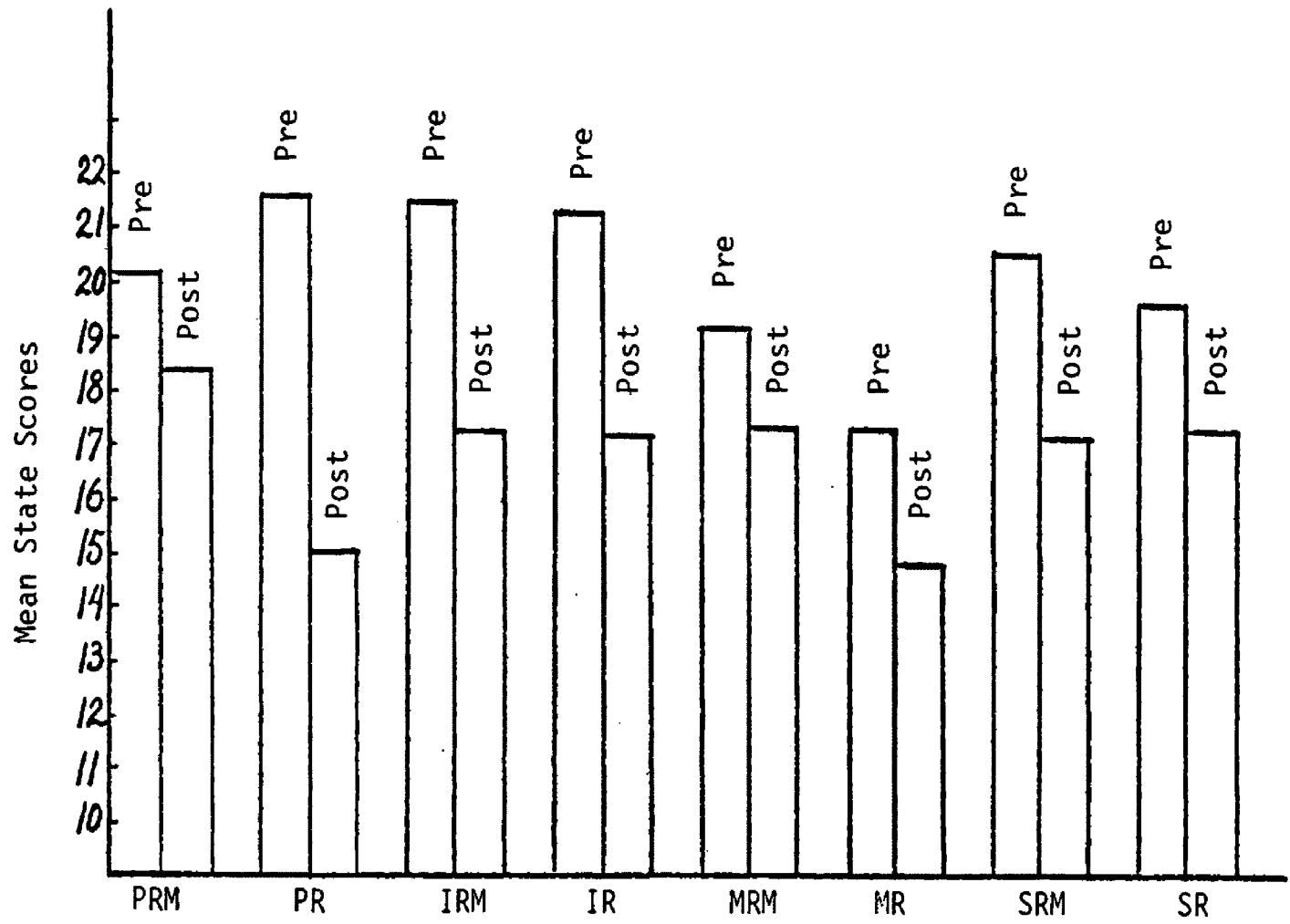
Analysis of treatment effects was accomplished via separate 4x2x2 repeated measures factorials on State, Trait, Taylor, and EMG data. The factors were as follows: A) four relaxation conditions (PR, IR, MR, and SR); B) music and no-music conditions; and C) pre-treatment and post-treatment measures on each of the dependent variables. In the following paragraphs the results of these analyses for each set of data will be reported. Before doing this, however, it is necessary to explain how the data will be reported. As discussed by Huck and McLean (1975), when utilizing a repeated measures ANOVA in a pretest-posttest design, it is inappropriate to use the F ratios of the main effects for treatments (in the present study relaxation condition and music-no music) or their interactions as they are averaged across the pre-post measures and thereby provide meaningless results regarding actual treatment effects. As these authors state, the only F ratios which can actually be meaningfully interpreted are those dealing with the main effects for trials (pre-post) and the subsequent interactions of the treatments by trials (in the present study: relaxation condition by pre-post, music-no music by pre-post, and relaxation condition by music-no music by pre-post). Thus, when reporting the results of the various

analyses in the following paragraphs only the F ratios for trials (C) and interactions of treatments by trials (AC, BC, and ABC) will be reported and the F ratios for the treatment main effects and their interactions (A, B, and AB) will be disregarded to eliminate confusion.

The first set of results to be reported will be those obtained from the State portion of the STAI. The repeated measures ANOVA on this data revealed highly significant differences between pretest and posttest scores [$F(1, 72) = 27.888, p < .001$] on the trials main effect. Examination of the pre- and post-treatment means reveals that the State scores changed in the "relaxed" direction. However, although there was a significant change in the relaxed direction from pre-treatment scores to post-treatment scores, the analysis also revealed that there were no significant differences between the treatment groups in bringing about this change. The two factor relaxation condition by pre-post and music-no music by pre-post interactions were not significant [$F(3, 72) = .647$ and $F(1, 72) = .741, p > .10$] nor was the three factor relaxation condition by music-no music by pre-post interaction [$F(3, 72) = 1.127, p > .10$]. Graphical display of the results (see figure 1) illustrates that all groups exhibited pre to post changes but that there were no differential treatment effects. None of the relaxation procedures were superior to one another nor were any superior to the SR control group.

Mean Scores on the State Portion of the STAI

Figure 1



The next set of results are those obtained from the Trait portion of the STAI. The repeated measures ANOVA on this data revealed no significant differences between pretest and posttest scores [$F(1, 72) = .075, p > .10$] on the trials main effect. Thus, there was no significant change in the Trait scores as a result of administering the relaxation treatments. In line with this finding, results also indicated that the two factor relaxation condition by pre-post interaction and the three factor relaxation condition by music-no music by pre-post interaction were not significant [$F(3, 72) = 1.897$ and $F(3, 72) = .382, p's > .10$]. However, the two factor music-no music by pre-post interaction did achieve significance [$F(1, 72) = 8.710, p < .01$]. Since none of the other comparisons in this analysis achieved significance, especially those pertaining to overall pre-post change, this result is attributed to random error rather than any real treatment effect. In the absence of any other treatment effects, this result certainly cannot be considered valid.

The third set of results are those obtained from the Taylor Manifest Anxiety Scale. The repeated measures ANOVA on this data revealed no significant differences between pretest and posttest scores [$F(1, 72) = .961, p > .10$] on the trials main effect. Thus, again, no significant changes in Taylor scores resulted from the administration of the relaxation procedures. Furthermore,

neither the two factor relaxation condition by pre-post and music-no music by pre-post interactions nor the three factor relaxation condition by music-no music by pre-post interaction were significant [$F(3, 72) = 2.035$, $F(1, 72) = 2.339$, and $F(3, 72) = 1.937$ respectively, all $p's > .10$].

The final set of results for pre-post comparisons are those obtained from the EMG measurements. The repeated measures ANOVA was performed on the transformed (log base 10) data since the raw data exhibited nonhomogeneity of variance as mentioned above. Analysis of this data revealed highly significant differences between pre-treatment measures and post-treatment measures [$F(1, 72) = 37.434$, $p < .001$] on the trials main effect. Examination of the pre- and post-treatment means revealed that the EMG measures had changed in the "relaxed" direction. Analysis of the treatments by trials interactions, however, once again revealed that there were no significant differences between the treatments in bringing about the decrease in EMG measures. The two factor relaxation condition by pre-post and music-no music by pre-post interactions were not significant [$F(3, 72) = 1.284$ and $F(1, 72) = .090$, $p's > .10$]. The three factor relaxation condition by music-no music by pre-post interaction was also not statistically significant [$F(3, 72) = 2.185$, $p > .05$] although it did approach significance. The untransformed EMG data are graphed in figure 2 and it can be seen

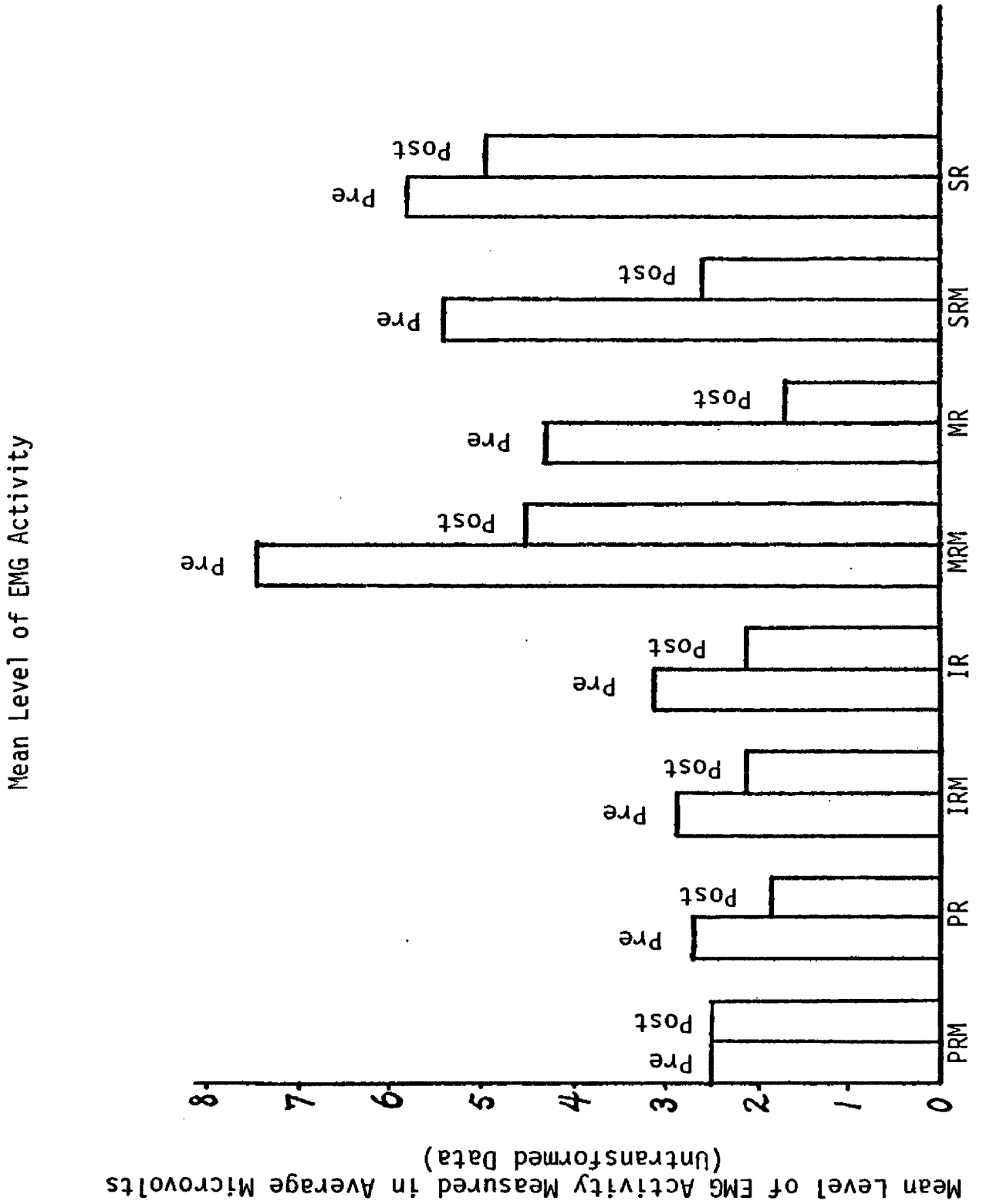


Figure 2

that all groups, except the PRM group, displayed pre to post changes. Again, however, the statistical analysis failed to find significant differences among the conditions in bringing about these changes.

In summary, analysis revealed that overall pre-treatment to posttreatment change did occur on the two measures expected to change as the result of a brief relaxation session (EMG measures and scores on the State portion of the STAI). However, none of the treatments was superior to one another nor were any of them superior to the self-relax control treatment in bringing about this change.

The next set of data analyses are those conducted on the responses to the post-experimental questionnaire. Questions A through H were analyzed via separate 4x2 factorial ANOVA's on each question. The factors were: 1) four relaxation conditions, and 2) music or no-music. Thus, for each analysis, the main effects for relaxation condition and music-no music and their interaction were examined. The results of these analyses are reported in table 1. As can be seen from these results, there were no significant differences between the groups on responses to questions A ("In the past how often have you experienced periods of anxiety, nervousness, or up-tightness in your day to day living?"), B ("In the past when you have experienced periods

TABLE 1

4X2 FACTORIAL ANALYSIS OF POST-EXPERIMENTAL
QUESTIONNAIRE ITEMS A THROUGH H

Item	Source of Variance	df	F Ratio
A-	A	3,72	1.915
	B	1,72	.591
	AB	3,72	.338
B	A	3,72	1.898
	B	1,72	.765
	AB	3,72	2.214
C	A	3,72	.448
	B	1,72	0.000
	AB	3,72	1.022
D	A	3,72	.732
	B	1,72	.439
	AB	3,72	3.073*
E	A	3,72	1.470
	B	1,72	0.000
	AB	3,72	3.552*
F	A	3,72	2.154
	B	1,72	1.789
	AB	3,72	5.367**
G	A	3,72	3.205*
	B	1,72	.192
	AB	3,72	8.370***
H	A	3,72	3.995*
	B	1,72	.202
	AB	3,72	3.988*

A = Relaxation Treatments (PR, IR, MR, SR)

B = Music or No Music

* $p < .05$

** $p < .01$

*** $p < .001$

of anxiety in your day to day living, how severe did the anxiety seem to be in 'general'?), and C ("How nervous, anxious, or up-tight did you feel before beginning today's relaxation session?"). This, again, demonstrates that the groups were adequately randomized and equated prior to the initiation of the relaxation treatments. However, on responses to questions D through H (how anxious after the session, how helpful or effective was the session, how useful were the skills you learned, how logical or sensible was the treatment, and how confident would you be in recommending this to a friend) significant differences were found between the treatment groups. In line with the recommendations of Snedecor and Cochran (1967, p. 272), on those analyses in which a significant F ratio was obtained paired comparisons were performed using the Least Significant Difference (LSD) test. The results of these comparisons are reported in table 2.

As considerable data is presented and the findings are somewhat complex, the results of the paired comparisons will be briefly summarized. On question D the responses indicated that the SRM and MR conditions produced greater degrees of relaxation (according to subjects self-report) than the MRM condition, while all other conditions were intermediate. Responses to question E indicated that subjects found the PR, MR, and SRM conditions more helpful than the SR control condition and the MR condition addi-

TABLE 2
 MEANS SIGNIFICANTLY DIFFERENT AT THE .05
 LEVEL USING THE LSD TEST

Item	Groups and Means				
D (lower score indicates greater relaxation)	MRM	(2.1)	- SRM	(1.3)	
	MRM	(2.1)	- MR	(1.3)	
E (greater score indicates more helpful)	PR	(5.4)	- SR	(3.9)	
	MR	(5.9)	- SR	(3.9)	
	SRM	(5.2)	- SR	(3.9)	
	MR	(5.9)	- IR	(4.3)	
	MR	(5.9)	- PRM	(4.4)	
F (greater score indicates more useful)	PR	(5.7)	- SR	(3.8)	
	MR	(5.7)	- SR	(3.8)	
	SRM	(5.0)	- SR	(3.8)	
	PR	(5.7)	- IRM	(4.4)	
	PR	(5.7)	- IR	(4.4)	
	PR	(5.7)	- MRM	(4.6)	
	PR	(5.7)	- PRM	(4.2)	
	MR	(5.7)	- IRM	(4.4)	
	MR	(5.7)	- IR	(4.4)	
	MR	(5.7)	- MRM	(4.6)	
	MR	(5.7)	- PRM	(4.2)	
G (greater score indicates more logical)	PR	(5.8)	- SR	(3.6)	
	PRM	(5.7)	- SR	(3.6)	
	IR	(6.4)	- SR	(3.6)	
	IRM	(5.1)	- SR	(3.6)	
	MR	(6.3)	- SR	(3.6)	
	MRM	(5.0)	- SR	(3.6)	
	SRM	(5.8)	- SR	(3.6)	
	IR	(6.4)	- IRM	(5.1)	
	IR	(6.4)	- MRM	(5.0)	
	MR	(6.3)	- IRM	(5.1)	
	MR	(6.3)	- MRM	(5.0)	
	H (greater score indicates more confident)	Treatment A Main Effect -			
		PR (M&NM) [5.75] - SR (M&NM) [4.20]			
Interaction AB					
PR		(6.3)	- SR	(3.3)	
PRM		(5.2)	- SR	(3.3)	
IR		(5.6)	- SR	(3.3)	
IRM		(5.2)	- SR	(3.3)	
MR		(5.7)	- SR	(3.3)	
MRM		(4.8)	- SR	(3.3)	
SRM		(5.1)	- SR	(3.3)	
PR		(6.3)	- MRM	(4.8)	

tionally superior to the IR and PRM conditions. Responses to question F indicated that the subjects felt the PR, MR, and SRM conditions to be more useful than the SR condition and the PR and MR conditions to be also more useful than all the remaining other conditions. On question G subjects indicated that all the relaxation conditions were more logical than the SR condition and of these the IR and MR conditions were the most logical, the IRM and MRM conditions the least, and the others intermediate. Finally, on question H, subjects indicated they would be more confident recommending either PR condition to a friend than either SR condition (treatment main effect). Additionally, they felt more confident recommending any of the treatments over the SR control and of these they felt most confident about the PR treatment, least confident about the MRM condition, and intermediate about the remaining others.

Lest the above summary be confusing, a general interpretation of the findings will be briefly discussed. The results of the two questions dealing with relaxation effects (D and E) are somewhat ambiguous, but there is some consistency of subjects indicating the MR condition to be superior in that it achieved the greatest significance in both analyses. In addition, the PR and SRM conditions were also indicated to be successful in achieving relaxation while all other conditions did not differ from one another.

On the questions dealing with subject's overall evaluations of the treatments on dimensions such as usefulness, sensibleness, and confidence (E, F, and G), the results are somewhat clearer. In general, subjects evaluated all treatments more favorably than the SR control condition. The treatments that consistently stand out as being rated most superior are the PR and MR conditions while, for the most part, the others fall in the intermediate ranges.

The final results to be reported in this section are those from the 40 subjects who were in the music conditions and responded to the question: "How useful did you find the music in helping you relax during the session you just completed?" A one-way ANOVA on the data from subjects in the four music groups (PRM, IRM, MRM, and SRM) indicated no significant differences [$F(3, 36) = 1.133, p > .10$] between these groups in their ratings. Examination of the means for each group indicated that the mean ratings of usefulness were around the moderate category (scale rating 4 = moderately useful; PRM = 4.1, IRM = 5.4, MRM = 5.3, and SRM = 5.3). A somewhat closer examination revealed that 22.5 percent of the subjects rated the usefulness as 3 or below (1 = not at all useful), 30 percent rated it 4 or 5, and 47.5 percent rated it 6 or 7 (7 = extremely useful).

CHAPTER IV

DISCUSSION

The results of the present investigation indicate that relaxation training can result in significant decreases in "anxiety" as measured via a self-report inventory (STAI-State) and a physiological measure (EMG). However, the results also indicate a failure of specific relaxation training techniques to be any more effective in reducing anxiety than simply having individuals sit quietly and relax themselves. This is not to say that relaxation training techniques do not work, but rather that formal training procedures may not be any more effective than having subjects utilize their own natural skills. This finding is in apparent contradiction to previous research which has found relaxation training to be superior to self-relaxation. The deep-muscle procedure in this study was highly similar to the procedure used by Paul (1969), yet while he was able to demonstrate a clear superiority of relaxation training over self-relaxation this finding was not replicated in the present study. One major difference between Paul's investigation and the present one is the fact that Paul used "live" instructions whereas this author used taped instruc-

tions. This difference becomes particularly salient when one considers the findings of Paul and Trimble (1970) that taped instructions failed to produce real relaxation. However, this did not appear to be the case in the present study, as taped instructions did produce relaxation effects both via self-report and physiological indices. Other studies which have shown relaxation training effects superior to control procedures are those of Beary and Benson (1973), Brady (1973), Johnson and Spielberger (1968), Pascal (1949), and Sherman and Plummer (1973), to mention a few. These studies, however, are not directly comparable to the present investigation because of a variety of procedural differences (different methods of relaxation, longer training times, different control procedures, etc.). Interestingly enough, the current research does appear to be congruent with two other previous findings reported in the literature. Lader and Mathews (1970) found deep-muscle relaxation no better than control procedures, but rather than questioning the relaxation procedure they instead questioned the use of physiological measures and brief treatments. In the current study a brief treatment was successful and physiological measures did respond as expected (and were congruent with other measures). Thus there is no real basis for questioning these factors but there is a basis for questioning the superiority of the relaxation treatments. The other finding was that of Grossberg as reported by Lang

(1969, p. 173) in which brief relaxation training was not found superior to a group that listened to music only.

Before discussing the implications of the above it is necessary to consider the validity of the present findings by considering alternative explanations of the results. An important point to address in any experimental investigation is the possibility that the findings are the result of demand characteristics, rather than the experimental manipulations which may of course lead to erroneous conclusions. It is felt that this hypothesis can be ruled out in the present investigation. First of all, the two measures of trait anxiety (Trait portion of the STAI and Taylor Manifest Anxiety Scale), which were included to serve as checks on demand, did not change significantly from the pretreatment assessment to the posttreatment assessment. Only those measures of state anxiety (State portion of the STAI and EMG), which would be predicted to change, did actually decrease. It is implausible to assume that demand would have had a powerful effect on only two of the four measures when all were administered in an identical manner. Furthermore, while test data can be influenced by demand characteristics, it would be difficult to see how a physiological measure, like EMG data, could respond to demand characteristics. Finally, even if some demand characteristics were operative it would be only logical to assume that they would be least likely to occur in the SR

control condition where subjects received no relaxation instructions or any other suggestions that they were relaxing. Thus, the major finding of the investigation, namely that self-relaxation was as effective as a specific treatment technique, would receive even more support.

Another possible source of error in experimental investigations is that of experimenter bias in either the handling of subjects or the recording of data. This is not felt to be a factor in the present investigation for three important reasons. First, all subjects were dealt with in a standard fashion. They were introduced to the study and given the explanatory statements in standardized form and there were no variations from this. Secondly, all relaxation instructions were presented via audio tape and the experimenter was absent from the room throughout the treatment, thus allowing no variation in the presentation of the procedures. Third, all data were objective in nature and not subject to recording errors. Inventory data was provided by the subjects' personal responses and scored by standardized scoring procedures. EMG data was recorded directly from a digital display in the form utilized in the statistical analysis and was not, therefore, subject to any alteration, change, or decision-making process.

Other potential sources of experimental confounding have also been adequately controlled for by the experimental procedures of this study. Error due to subject selection

bias could not be a factor as subjects were self selected in that they responded voluntarily to an offer of relaxation training and were not preselected on any grounds. Differential handling of subjects was also protected against in that all treatment manipulations were standardized and actual experimenter-subject contact was minimal. In short, the evidence would support the contention that extraneous variables were adequately controlled for and the probability of confounding is quite low.

In light of the foregoing, it would seem reasonable to conclude that the present results are valid and that reliable evidence has indeed been gathered that formal relaxation training may not be any more effective than having individuals utilize personal relaxation skills. An obvious implication of this finding is that more research is definitely needed. While relaxation has been extensively researched in relation to systematic desensitization and while it has been clinically applied in treatment settings, there is actually very little research aimed at demonstrating its effectiveness, per se, or attempting to analyze the active components of relaxation. There is a need for controlled research comparing various types of relaxation procedures to one another and possibly one of the types of procedures to compare would be self-relaxation. An implication for applied research which uses relaxation as a treatment for a specified clinical problem is that no-treatment controls

may not be adequate to demonstrate the effectiveness of a particular procedure per se and it may be important to include a self-relaxation treatment group in order to assess its effects. Research may well show that the effective component of all relaxation procedures is simply having an individual sit quietly, clear their minds of disturbing thoughts, and concentrate on getting relaxed. This is certainly an empirical question.

The question comes to mind whether it is important that individuals may be able to relax as effectively using personal skills as they can using a formal technique. The answer would seem to be yes. Current work in the area of attribution theory (Kelley, 1973, Valins & Nisbett, 1971) and self-perception theory (Bem, 1972) suggests that attributional processes may have an important role in helping to alleviate a variety of problems. If individuals can discover that they have skills within themselves and attribute positive change to these personal skills, it would seem that this discovery could have an enhancing effect on their ability to cope effectively with other problems, both in and out of therapy settings. It would certainly seem that virtually any clinical psychologist would welcome the opportunity to demonstrate to his clients that they possess strengths and coping skills within themselves. While this discussion is admittedly highly speculative and may seem premature given only very limited data at this time, it is

simply intended to highlight a potentially important issue and point out possible worthwhile directions for future research.

What has been said to this point could be interpreted as implying that formal relaxation techniques may be of no real value. This is certainly not the intention of the forgoing discussion as it is felt that the study also reveals positive results for the use of relaxation techniques. The most important finding is that relaxation procedures can induce significant changes in both physiological and inventory indices of anxiety. While the formal techniques did not achieve this any more successfully than self-relaxation, the results of the post-experimental questionnaire indicate that the relaxation techniques were evaluated significantly more positively than was self-relaxation. On dimensions such as helpfulness, usefulness, sensibleness, and confidence subjects were much more positive in their ratings of the formal relaxation procedures than of the self-relax condition. The success of any treatment procedure is obviously going to hinge on how a client feels about it and how much sense it makes to him. As Lazarus (1971) has aptly pointed out, a clinician must meet a client's expectations before treatment can be successfully engaged in. Thus, the usefulness of any kind of self-relaxation training is bound to be mitigated by how an individual feels about it and evaluates its likelihood of success. If for no other reason than

the fact that clients would feel more positively about a formal relaxation procedure, it still retains a high degree of utility.

Another important point that has not yet been mentioned is how generalizable are the results of this particular investigation. Granted that in this study self-relaxation was as successful as formal procedures, the question arises as to how broad the implications of this finding are. First of all, it must be noted that the current procedures were applied for only a brief period of time. The purpose of the investigation was only to assess short-term effects of relaxation training. For this reason the results have no implication for the long-term effects of a program of relaxation training. It may well be that if relaxation training is to generalize over time and truly be "learned" by an individual, formal training in one type or another of a specific technique will be necessary. This is a question that can only be answered by further research. Secondly, the training in this study was not aimed at any particular type of anxiety. It may well be that the target behavior toward which training is aimed can have a powerful influence on which type of training procedure works best. Thirdly, level of anxiety was not controlled for in the present investigation. Subjects were not pre-selected on the basis of their current anxiety level or history of anxiety related problems. Possibly, what type of relaxation procedure is most effective may depend on the

individual's level, type, and history of anxiety. Again, this is an empirical question open to further research investigation. Finally, only three specific types of relaxation treatments were compared with self-relaxation. As there are a variety of other procedures available for use, the current results have no direct implications for any procedures other than the three that were compared.

In the introduction to this investigation, several questions were posed which this research was attempting to answer. It is now time to see if these questions have been answered. One of the questions was: Can a brief relaxation procedure achieve significant degrees of relaxation? In view of the results the answer would have to be yes. Significant degrees of relaxation were consistently obtained by subjects in all conditions on both inventory and physiological data. The changes from pre- to posttreatment were obtained in only 30 minutes and virtually all subjects reported that they had had a very worthwhile experience. This is a promising finding in that results were obtained quickly and efficiently. Since a brief procedure can be quite successful the next step is to discover applications for this type of procedure. In the introduction, a brief procedure was discussed as having possible benefit as a therapy adjunct and it would seem the time has come to see if this is the case. Research could be devised which attempts to discover if relaxation training can enhance ongoing therapy and contribute to positive change.

Certainly a brief procedure is quick and efficient and does not require undue time or effort and if it can be helpful there would seem to be no reason not to use it. Also, beyond its use as a therapy adjunct, a brief procedure may result in time savings if it could be used where longer procedures are now used. Again, it may be fruitful to investigate if shorter procedures can work just as well in many of the applications to which relaxation is now put.

Another of the questions asked was: What type of relaxation procedure is most efficient in a brief training program? No answer was obtained for this question. All procedures, including the self-relaxation one, were equally successful over the 30 minute training period. Thus, as previously mentioned, more work is needed in discovering the active components of relaxation training and comparing different training variations. When more data is in as to which type of procedures work best, it may be possible to answer the above question.

A third question that was asked was: Can a technique utilizing mental or cognitive means of achieving relaxation be just as effective (or more so) than a deep-muscle technique? The answer to this is a qualified yes. Although none of the procedures was more effective than any other nor were any of them superior to self-relaxation, the mental technique did perform as well as the muscular technique. This would seem to be a positive finding for mental procedures since they

apparently can successfully compare to the older, more established deep-muscle methods. Although the issue of whether anxiety can only be successfully overcome by physiological methods or whether cognitive factors are important was not directly researched, some suggestive evidence was found. The results of the present study would appear to lend support to those researchers who adhere more to the cognitive model of anxiety development and treatment (Davison, 1966a; Rachman, 1968; Marshall et al., 1972). The current findings point out that relaxation can be achieved without specifically using physical methods. This issue is of course highly complex and the present study can by no means provide any definitive evidence toward its resolution.

The final question that was posed was: Can music paired with relaxation instructions enhance the process? The evidence suggests that music does not necessarily contribute enhancing relaxation effects. There were no consistent results indicating that subjects who received music were any more successful in relaxing than subjects who did not. Although the majority of subjects who did receive music rated it at least moderately useful, the results indicate no greater degrees of relaxation nor no more positive ratings of the procedures when music is added, with one exception. For those subjects who self-relaxed, adding music did result in more positive ratings of the procedure. It apparently made more sense to these subjects to have some type of aid in

their efforts to self-relax. Thus, if further investigation reveals that self-relaxation training is a viable procedure it may be that adding music can even further enhance the process. As to the ability of music to enhance the effects of formal training techniques, the evidence appears to indicate that music is of no real value.

In conclusion, it would appear that the most important finding of the current investigation is that individuals can achieve significant degrees of relaxation after only a brief period of time. Relaxation obtained quickly and efficiently holds promise for a variety of applications and could be a useful procedure for the practicing clinician to have on hand. The second major finding is only presently suggestive but also has promise. This finding is that individuals may possess personal relaxation skills that can be quite effective in reducing anxiety or tension. If this is the case, this self-help skill may also have important application in a variety of situations. While the concept of self-relaxation abilities is admittedly only hypothetical at present, if this discovery could be replicated useful information may result. A third finding is that mental techniques of achieving relaxation can be as successful as muscular techniques within the limitations of the current study. All in all some interesting findings have been obtained and some important directions for further research have been highlighted. If this research is

accomplished useful knowledge with broad application may very well be the end result.

CHAPTER V

SUMMARY

Relaxation procedures were first devised early in this century by Edmund Jacobson and were later brought into the realm of psychology by Joseph Wolpe (1958). Considerable research has looked at relaxation training as a component of systematic desensitization but considerably less research has focused on it as a treatment in its own right. A variety of training techniques have been devised but relatively few controlled comparisons of these techniques have been done. Relaxation procedures have been used for brief training periods with success and a brief procedure may hold promise for a variety of clinical applications. The question also arises as to whether music paired with relaxation instructions can have an enhancing effect on training. The present investigation was aimed at answering several questions:

- a) What type of relaxation procedure is most efficient in a brief training program,
- b) Can a technique utilizing cognitive methods of relaxation be as effective as a deep-muscle technique,
- c) Can a brief procedure achieve significant degrees of relaxation, and
- d) Can music paired with relaxation instructions enhance the process?

Eighty subjects were recruited to undergo a 30 minute relaxation procedure and relaxation effects were assessed via self-report inventories, a physiological measure, and a post-experimental questionnaire. Subjects received either progressive relaxation, intermediate relaxation, mental relaxation, or self-relaxation instructions. In addition, half of the subjects in each condition had background music paired with the relaxation procedure. Pretreatment and posttreatment data was collected in order to assess relaxation effects.

Highly significant changes in the relaxed direction were obtained on the State portion of the State-Trait Anxiety Inventory and on EMG data. However, there were no differences between any of the treatment conditions in bringing about these changes with all being equally effective. On the post-experimental questionnaire items it was found that subjects generally evaluated the other conditions more positively than the self-relaxation condition.

Although significant decreases in "anxiety" were obtained with brief relaxation training procedures, the results of this study failed to replicate earlier findings that formal training techniques are superior to having subjects simply relax themselves. The possibility was presented that self-relaxation may be a viable technique under certain circumstances and is worthy of further investigation. Even though formal training techniques were no more successful than self-

relaxation in the present investigation, they were still able to achieve significant degrees of relaxation and thus demonstrate a high degree of utility. The results of this study did provide answers to some of the questions originally posed. It was demonstrated clearly that a brief procedure can achieve significant degrees of relaxation quite effectively. It also appears that cognitive procedures can be as effective as deep-muscle procedures in a brief application. The results, however, provide no answer as to which type of a procedure would be most effective in a brief application as all procedures performed equally well. Music does not appear to have an enhancing effect when paired with relaxation instructions but pairing it with self-relaxation does seem to make this procedure more plausible to subjects. The results of this investigation clearly lead to the conclusion that more research is definitely needed in the area of relaxation training.

A P P E N D I C E S

APPENDIX A

**ANXIETY SCALES AND POST-EXPERIMENTAL
QUESTIONNAIRE**

Taylor Manifest Anxiety Scale

Pre-Test

INSTRUCTIONS: The statements below represent experiences, ways of doing things, or beliefs or preferences that are true of some people but are not true of others. Read each statement and decide whether or not it is true with respect to yourself. If it is true or mostly true, place a "T" on the line by the number of the statement. If the statement is not usually true or is not true at all, place an "F" on the line by the number of the statement. Answer the statement as carefully and honestly as you can. There are no correct or wrong answers. Answer each statement to show the way you work or the things in which you believe.

- _____ 1. I have very few headaches.
- _____ 2. I work under a great deal of strain.
- _____ 3. I worry over money and business.
- _____ 4. I frequently notice my hand shakes when I try to do something.
- _____ 5. I blush as often as others.
- _____ 6. I have diarrhea (the runs) once a month or more.
- _____ 7. I worry quite a bit over possible troubles.
- _____ 8. I practically never blush.
- _____ 9. I have nightmares every few nights.
- _____ 10. My hands and feet are usually warm enough.
- _____ 11. I have a great deal of stomach trouble.
- _____ 12. At time I lose sleep over worry.
- _____ 13. I am easily embarrassed.
- _____ 14. My feelings are hurt easier than most people.
- _____ 15. I am usually calm and not easily upset.
- _____ 16. I cry easily.
- _____ 17. I am happy most of the time.
- _____ 18. It makes me nervous to have to wait.
- _____ 19. I have periods of such great restlessness that I cannot sit long in a chair.

- _____ 20. I must admit that I have at times been worried beyond reason over something that really did not matter.
- _____ 21. I have been afraid of things or people that I knew could not hurt me.
- _____ 22. I find it hard to keep my mind on a task or job.
- _____ 23. I am inclined to take things hard.
- _____ 24. Life is a strain for me much of the time.
- _____ 25. I shrink from facing a crisis or difficulty.

Taylor Manifest Anxiety ScalePost-Test

INSTRUCTIONS: The statements below represent experiences, ways of doing things, or beliefs or preferences that are true of some people but are not true of others. Read each statement and decide whether or not it is true with respect to yourself. If it is true or mostly true, place a "T" on the line by the number of the statement. If the statement is not usually true or is not true at all, place an "F" on the line by the number of the statement. Answer the statement as carefully and honestly as you can. There are no correct or wrong answers. Answer each statement to show the way you work or the things in which you believe.

- _____ 1. I do not tire quickly.
- _____ 2. I am often sick to my stomach.
- _____ 3. I am about as nervous as other people.
- _____ 4. I cannot keep my mind on one thing.
- _____ 5. I am often afraid that I am going to blush.
- _____ 6. I sweat very easily even on a cool day.
- _____ 7. When embarrassed, I often break out in a sweat which is very annoying.
- _____ 8. I am almost never bothered by pains over the heart or in my chest.
- _____ 9. I feel hungry most of the time.
- _____ 10. Often my bowels don't move for several days at a time.
- _____ 11. My sleep is restless and disturbed.
- _____ 12. I often dream about things I don't like to tell other people.
- _____ 13. I often find myself worrying about something.
- _____ 14. I wish I could be as happy as others seem to be.
- _____ 15. I feel anxiety about something or someone almost all the time.
- _____ 16. Sometimes I become so excited that I find it hard to get to sleep.
- _____ 17. I have sometimes felt that difficulties were piling up so high that I could not overcome them.
- _____ 18. I have very few fears compared to my friends.

y feel useless at times.

- _____ 20. I am unusually self-conscious.
- _____ 21. I am high-strung.
- _____ 22. At times I think I am no good at all.
- _____ 23. I am certainly lacking in self-confidence.
- _____ 24. I sometimes feel that I am about to go to pieces.
- _____ 25. I am entirely self-confident.

State-Trait Anxiety InventoryPre-Test State

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

	Not at all	Somewhat	Moderately so	Very much so
1. I am tense-----	1	2	3	4
2. I feel at ease-----	1	2	3	4
3. I feel upset-----	1	2	3	4
4. I feel rested-----	1	2	3	4
5. I feel comfortable-----	1	2	3	4
6. I feel nervous-----	1	2	3	4
7. I am jittery-----	1	2	3	4
8. I feel "high strung"-----	1	2	3	4
9. I am relaxed-----	1	2	3	4
10. I am worried-----	1	2	3	4

State-Trait Anxiety InventoryPre-Test Trait

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

	Almost Never	Sometimes	Often	Almost always
1. I wish I could be as happy as others seem to be-----	1	2	3	4
2. I am "calm, cool, and collected"-----	1	2	3	4
3. I feel that difficulties are piling up so that I cannot overcome them-----	1	2	3	4
4. I worry too much over something that really doesn't matter-----	1	2	3	4
5. I lack self-confidence-----	1	2	3	4
6. I try to avoid facing a crisis or difficulty-----	1	2	3	4
7. Some unimportant thought runs through my mind and bothers me-----	1	2	3	4
8. I take disappointments so keenly that I can't put them out of my mind-----	1	2	3	4
9. I am a steady person-----	1	2	3	4
10. I get in a state of tension or turmoil as I think over my recent concerns and interests-----	1	2	3	4

State-Trait Anxiety Inventory

Post-Test State

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

	Not at all	Somewhat	Moderately so	Very much so
1. I feel calm-----	1	2	3	4
2. I feel secure-----	1	2	3	4
3. I am regretful-----	1	2	3	4
4. I am presently worrying over possible misfortunes-	1	2	3	4
5. I feel anxious-----	1	2	3	4
6. I feel self-confident-----	1	2	3	4
7. I feel content-----	1	2	3	4
8. I feel over-excited and "rattled"-----	1	2	3	4
9. I feel joyful-----	1	2	3	4
10. I feel pleasant-----	1	2	3	4

State-Trait Anxiety InventoryPost-Test Trait

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

	Almost Never	Sometimes	Often	Almost always
1. I feel pleasant-----	1	2	3	4
2. I tire quickly-----	1	2	3	4
3. I feel like crying-----	1	2	3	4
4. I am losing out on things because I can't make up my mind soon enough-----	1	2	3	4
5. I feel rested-----	1	2	3	4
6. I am happy-----	1	2	3	4
7. I am inclined to take things hard-----	1	2	3	4
8. I feel secure-----	1	2	3	4
9. I feel blue-----	1	2	3	4
10. I am content-----	1	2	3	4

Post-Experimental Questionnaire

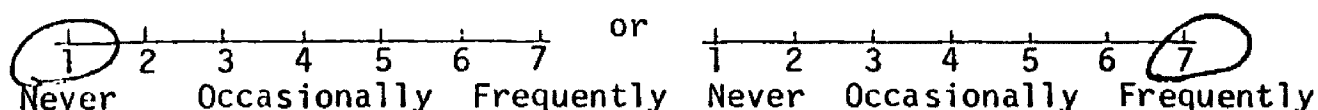
The following questions are intended to provide us with further information about your experiences with anxiety and your reactions to the session today. This information is necessary for us to gather more facts about anxiety and evaluate the effectiveness of our procedures. Please read each question carefully and answer each as accurately as you can based upon your personal estimate. Answer each as truthfully and honestly as you can so that the data will be accurate.

All responses will be strictly confidential.

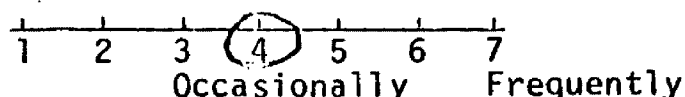
Each question is followed by a scale on which you are to respond with your answer. The scales range from 1 to 7 with each number representing an equal increase. The beginning and end points and middle point of each scale are labeled with descriptive statements to help you locate your answer to the questions. As you respond, locate the point that most accurately represents your answer and circle the number at that point. For example, if your answer is best represented by one of the statements, circle that number; but if it is more accurately represented by a point intermediate between the statements, circle the number corresponding to that point.

Example: How often in the past have you experienced periods of anxiety? Rate on a scale from 1 to 7, with 1 equaling "never" and 7 equaling "frequently."

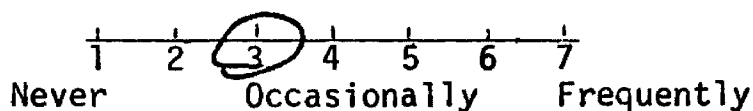
For example, if "never" or "frequently" accurately represents your answer, you would mark as follows:



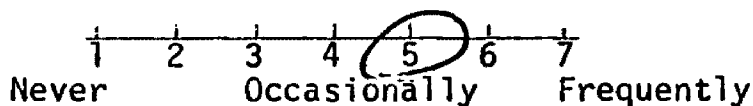
If "occasionally" is most accurate, mark as follows:



If your answer is intermediate between the statements, you might mark as follows:



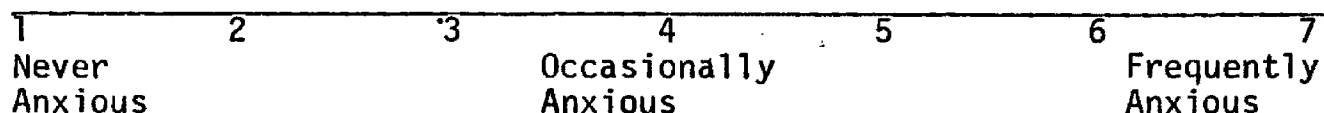
or



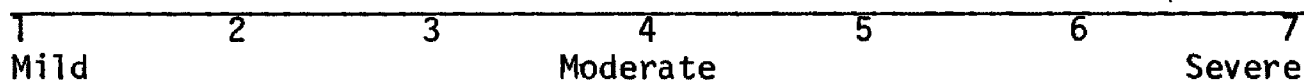
or possibly at another intermediate point.

* * * * *

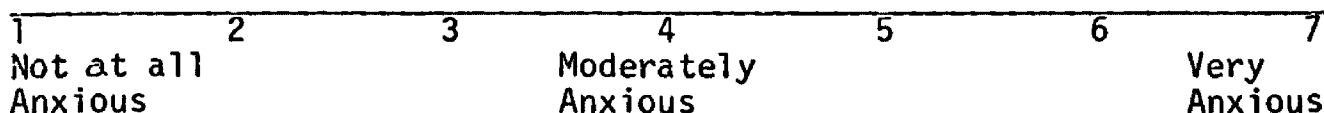
A) IN THE PAST HOW OFTEN HAVE YOU EXPERIENCED PERIODS OF ANXIETY, NERVOUSNESS, OR UP-TIGHTNESS IN YOUR DAY TO DAY LIVING? RATE ON A SCALE FROM 1 TO 7, WITH 1 EQUALING "NEVER ANXIOUS" AND 7 EQUALING "FREQUENTLY ANXIOUS."



B) IN THE PAST WHEN YOU HAVE EXPERIENCED PERIODS OF ANXIETY IN YOUR DAY TO DAY LIVING, HOW SEVERE DID THE ANXIETY SEEM TO BE IN "GENERAL"? RATE ON A SCALE FROM 1 TO 7, WITH 1 EQUALING "MILD" AND 7 EQUALING "SEVERE."



C) HOW NERVOUS, ANXIOUS, OR UP-TIGHT DID YOU FEEL BEFORE BEGINNING TODAY'S RELAXATION SESSION (THAT IS, JUST PRIOR TO THE SESSION)? RATE ON A SCALE FROM 1 TO 7, WITH 1 EQUALING "NOT AT ALL ANXIOUS" AND 7 EQUALING "VERY ANXIOUS."



D) HOW NERVOUS, ANXIOUS, OR UP-TIGHT DID YOU FEEL AFTER COMPLETING TODAY'S RELAXATION SESSION (THAT IS, JUST AFTER THE SESSION)? RATE ON A SCALE FROM 1 TO 7, WITH 1 EQUALING "NOT AT ALL ANXIOUS" AND 7 EQUALING "VERY ANXIOUS."

1	2	3	4	5	6	7
Not at all Anxious			Moderately Anxious			Very Anxious

E) HOW HELPFUL OR EFFECTIVE DID YOU FIND THE RELAXATION SESSION YOU JUST COMPLETED IN DECREASING YOUR ANXIETY DURING THE ONE-HALF HOUR SESSION? RATE ON A SCALE FROM 1 TO 7, WITH 1 EQUALING "NOT AT ALL HELPFUL" AND 7 EQUALING "EXTREMELY HELPFUL."

1	2	3	4	5	6	7
Not at all Helpful			Moderately Helpful			Extremely Helpful

F) HOW USEFUL DO YOU THINK RELAXATION SKILLS YOU LEARNED TODAY COULD BE IN HELPING YOU COMBAT ANXIETY IN YOUR DAY TO DAY LIVING? RATE ON A SCALE FROM 1 TO 7, WITH 1 EQUALING "NOT AT ALL USEFUL" AND 7 EQUALING "EXTREMELY USEFUL."

1	2	3	4	5	6	7
Not at all Useful			Moderately Useful			Extremely Useful

G) HOW LOGICAL OR SENSIBLE DID THE TREATMENT YOU JUST COMPLETED SEEM TO YOU? RATE ON A SCALE FROM 1 TO 7, WITH 1 EQUALING "NOT AT ALL LOGICAL" AND 7 EQUALING "EXTREMELY LOGICAL."

1	2	3	4	5	6	7
Not at all Logical			Moderately Logical			Extremely Logical

H) HOW CONFIDENT WOULD YOU BE IN RECOMMENDING THIS TREATMENT TO A FRIEND WHO EXPERIENCES OCCURRENCES OF ANXIETY, NERVOUSNESS, AND UP-TIGHTNESS? RATE ON A SCALE FROM 1 TO 7, WITH 1 EQUALING "NOT AT ALL CONFIDENT" AND 7 EQUALING "HIGHLY CONFIDENT."

1	2	3	4	5	6	7
Not at all Confident			Moderately Confident			Highly Confident

I) COMMENTS:

(Subjects who received music conditions had this additional page on their questionnaire and did not have Item I - comments on the previous page.)

I. HOW USEFUL DID YOU FIND THE MUSIC IN HELPING YOU RELAX DURING THE SESSION YOU JUST COMPLETED? RATE ON A SCALE FROM 1 TO 7, WITH 1 EQUATING "NOT AT ALL USEFUL" AND 7 EQUATING "EXTREMELY USEFUL."

1	2	3	4	5	6	7
Not at all Useful			Moderately Useful			Extremely Useful

J. COMMENTS:

APPENDIX B

INTRODUCTORY STATEMENTS

STANDARD INTRODUCTION

The purpose of what we will be doing here today is twofold. First of all, to give you a firsthand opportunity to experience and learn about a psychological relaxation training technique and secondly, to give us the opportunity to assess the effects of such a procedure on general anxiety level. Relaxation training has been utilized by clinical psychologists in therapeutic settings for many years and has been demonstrated to be a very effective procedure for combating all types of anxiety. Our purpose in this program is to gather further information on individuals' responses to relaxation training and attempt to accomplish further refinements which will enable us to make the procedures even more effective. Thus, you not only have the opportunity to experience an actual relaxation procedure but also the opportunity to help us gather very important information. The information we gather is very important and will have wide application to a variety of clinical situations, so your full cooperation and close adherence to all instructions is vital. Furthermore, by closely attending to and following the instructions, you will be able to learn the technique properly and then can utilize it yourself in the future when you experience periods of anxiety.

In a few minutes I will play a tape for you that has a complete set of relaxation training instructions on it. You

are simply to listen carefully to all the instructions and follow them exactly as they are described to you. In order to enable us to better understand the effects of such a procedure on bodily manifestations of stress and relaxation, we will be taking physiological measurements on you as you listen to the tape. Thus shortly I will hook you up to a physiological monitoring device so that we can take continuous readings during the procedure. Rest assured that you will experience no discomfort by being hooked up to our monitoring device. Again, the purposes of the physiological monitoring is to provide us with more information about bodily manifestations of anxiety and reactions to relaxation.

The tests which you took when you arrived here are designed to tell us about certain personality traits and their relation to various types of tension and so forth. You will be taking them again after the procedure is finished. After you have completed them the second time, we will be glad to answer any questions you have about them.

Again, the importance of listening carefully to the instructions and following them closely must be stressed. I will now hook you up to the monitoring device.

INTRODUCTORY STATEMENT FOR GROUPS VII & VIII

The purpose of what we will be doing here tonight is twofold. First of all, it will give you the opportunity to learn about and practice personal relaxation techniques and secondly, to give us the opportunity to gather information about individual self-relaxation skills. Learning to relax is an important ability that most individuals need to develop as it is essential to many aspects of well being. Clinical psychologists in recent years have become increasingly interested in various aspects of relaxation, and this type of information is very important as it has wide application to many settings. Thus the results of what we will be doing are important. You will have an opportunity to discover useful personal relaxation techniques that you can later apply during periods when you are anxious, and we will be gathering information that is highly useful in learning more about relaxation. So, your full cooperation is essential to ensure that you discover personal relaxation skills and that we gather reliable information.

In a few minutes I will signal you by saying "close your eyes and begin relaxing." When you receive these instructions, I simply want you to sit quietly in the chair, close your eyes, and try to relax yourself by any means you find effective. You are to continue this until receiving further instructions. It is important that you do not fall asleep

during this period at any time--I repeat, be sure to stay awake. Remember, by cooperating with these instructions and by paying attention to how relaxed you are getting during the period and what it is you are doing to get relaxed, you will be able to discover personal relaxation techniques that you can use at other times.

In order to enable us to study bodily manifestations of self-relaxation, we will be taking physiological measurements on you as you relax. Thus, shortly I will hook you up to some physiological monitoring devices so that we can take continuous readings during the period. Rest assured that you will experience no discomfort by being hooked up to our monitoring device. Again, the purposes of the physiological monitoring is to provide us with information about bodily manifestations of self-relaxation.

The tests which you took when you arrived here are designed to tell us about certain personality traits and their relation to various types of tension and so forth. You will be taking them again after the session is over. After you have completed them the second time, we will be glad to answer any questions you have about them.

Again, the importance of following the instructions must be stressed. I will now hook you up to the monitoring device.

APPENDIX C

RELAXATION INSTRUCTIONS

PROGRESSIVE RELAXATION INSTRUCTIONS

During the rest of this period you will be learning a deep-muscle relaxation technique which has been utilized by psychologists for many years in clinical settings. This is a technique that has been proven to be quite effective, and it is probable that you will find yourself learning to become more relaxed than you've ever been before. This procedure hinges on the fact that complete relaxation is the absence of muscular tension; thus if you are completely relaxed, it is physiologically impossible to be tense or anxious.

The way the procedure works is that we will have you systematically focus your attention on the various gross muscle groups throughout your body--first tensing each group for a few seconds, holding them long enough for you to identify exactly where you feel tension, and what it feels like. Then when I say "relax," I want you to immediately let go, to stop tensing, and merely focus your attention on what those muscles feel like as relaxation takes place. By first tensing your muscles, the level of tension increases over your current operating level such that when you release the muscles, the level of tension drops below the point where you started. Each time you tense and release a muscle group, the resulting level of tension becomes progressively

lower and lower--to the point where no tension is present at all. By focusing your attention on this process as it takes place, you will find yourself getting more and more relaxed. (Adapted from Paul, 1969b, p. 427.)

Now, I want you to do as follows: As we proceed I will describe the muscle group we will be working on at each stage of the procedure and I want you to focus only on this group and no other. After I describe the group, I will then instruct you on how to tense the muscles. Then, when I say "now," I want you to begin tensing and continue tensing the muscles until I say "relax" at which time you are to release the tension immediately. Okay, remember, I will describe the muscle group and how to tense it, but do not begin tensing until I say "now." When I say "now," tense the muscle group completely and focus only on this group. Continue tensing until I say "relax" and then release the muscles immediately.

Okay, we are ready to begin. Get comfortable in the chair, sit back completely, close your eyes, and keep them closed until instructed to open them again. (Begin music.)

(1) We are going to tense the muscles of the right hand and forearm and I want you to tense these muscles by making a tight fist with your right hand. Again, tense the muscles of your right hand and forearm by making a tight fist--now! Make them tense, feel the muscles pull across your fingers and the lower part of your forearm.

Focus on the tension; feel how tight the muscles are; feel the tension. (Tension is maintained for seven seconds.)

Okay, relax! That's right--relax. Notice the difference between the tension and relaxation of the muscles. Focus on the feelings in the muscles as they become more and more relaxed. Notice how they begin feeling warmer, heavier, and relaxed. Just notice the pleasant sensations; focus on them, experience the sensations. (Relaxation patten to continue for 30 seconds.)

Again, tense the muscles of your right hand and forearm by making a tight fist. Do this now! Make the muscles tense and pay attention to the muscles involved. Feel the tension and tightness. (Seven seconds of tension.)

Okay, relax! Attend only to those muscles; note how they feel as the relaxation takes place. They are becoming more and more relaxed, feeling warm and heavy. Notice the pleasant sensations; focus only on those sensations. (Thirty seconds of relaxation patten.)

(2) Next, we are going to tense the muscles of your right biceps and I want you to do this by pushing your elbow down against the arm of your chair. Again, I want you to tense the muscles of your right biceps--now! Tighten the biceps muscles; make them tense; feel the tension. (Seven seconds of tension.)

Okay, relax! (Use same patten as above and allow relaxation for 30 seconds.)

Again, tense the muscles of your right biceps by pushing down on the arm of your chair. Do this--now! (Same technique as above; tension to continue for seven seconds.)

Okay, relax! (Same patter with 30 second relaxation interval.)

(Proceed to each successive gross muscle group, listed below, in the same manner as above. Utilize similar tension and relaxation verbalizations for all muscle groups. Each group is tensed and relaxed twice; tension is maintained for seven seconds, and relaxation is maintained for 30 seconds.)

(3) Left hand and forearm--make a tight fist.

(4) Left biceps--again pushing elbow against arm of chair.

(5) Forehead--lift eyebrows as high as you can and tense forehead and scalp region.

(6) Wrinkle nose and squint eyes tensing the muscles of the upper cheek and nose.

(7) Lower cheeks and jaws--bite teeth together and pull the corners of the mouth back.

(8) Chin and throat--pull chin downward toward your chest while at the same time preventing it from actually touching your chest.

(9) Chest, shoulders and upper back--take a deep breath and pull the shoulder blades together.

(10) Stomach and abdominal region--make stomach and abdomen hard.

(11) Muscles of right upper leg--tense right thigh muscles.

(12) Right calf--pull the toes upward toward the head.

(13) Right foot--push down with toes and arch the foot.

(14) Muscles of left upper leg--tense left thigh muscles.

(15) Left calf--pull the toes upward toward the head.

(16) Left foot--push down with toes and arch the foot.

Okay, now we have relaxed the muscles in the arms and hands. Just allow them to continue to relax. We've relaxed the muscles in the face and neck. Go on allowing them to remain deeply relaxed. We've relaxed the muscles of the chest, the shoulders, the upper back, and the stomach. Allow these muscles now to become even more deeply relaxed. We've relaxed the muscles of the legs and feet. Just allow these muscles now to remain deeply and completely relaxed.

Now for the next few minutes sit back quietly and focus on the relaxed sensations from your entire body. Enjoy the pleasant and complete state of relaxation you are now in. [At this time the post-treatment EMG data was gathered.]

I will now count backwards from four to one, and as I do, you will feel yourself beginning to become more and more alert. Four--move your legs; three--now your fingers and hands; two--move your head around; one--open your eyes and sit up.

INTERMEDIATE RELAXATION INSTRUCTIONS

During the rest of this period, you will be learning a relaxation technique which has been utilized by psychologists in clinical settings. This is a technique that has been proven to be quite effective, and it is probable that you will find yourself learning to become more relaxed than you've ever been before. This procedure uses both physical and mental relaxation techniques. This is to say that you will learn muscular techniques of relaxation and also mental techniques of achieving a state of relaxation. In this way you can learn how to become completely relaxed to the point that it becomes impossible to be tense or anxious.

The procedure consists of two parts--the first part is instruction in deep-muscle relaxation, which I will explain in a moment, and the second part is the mental relaxation in which I will have you imagine various experiences, images, and sensations. This I will explain in detail later. Now let us start with the deep-muscle procedure. The way the procedure works . . . (utilize PR instructions beginning paragraph 2).

(The deep muscle portion is identical to that used in the PR instructions except that only seven muscle groups will be utilized rather than 16.)

(1) Muscles of right arm--hand, lower arm, and biceps--have subject hold arm out in front, bend elbow, and make a

tight fist.

(2) Muscles of the left arm.

(3) Facial muscles--have subject squint eyes, wrinkle nose, bite down, and pull back corners of mouth.

(4) Neck and throat muscles--tensed in same manner as in PR condition.

(5) Muscles of chest, shoulders, upper back, and abdomen--have subject take and hold a deep breath, pull shoulder blades back and together, and make the stomach hard.

(6) Muscles of the right thigh, calf, and foot--have subject lift leg off chair slightly, point toes, and turn the foot inward.

(7) Muscles of the left thigh, calf, and foot.

Now, for a few moments I would like you to concentrate on your breathing. Breathe at a nice, easy, slow pace and just concentrate on your breathing--nice and easy and relaxed. Very good. (60-second pause.) Now, for the next minute or so I want you to say the word "relax" to yourself. Do it like this: Every time you exhale, say "relax" to yourself--just say "relax" to yourself every time you exhale. Good, now just do that to yourself for the next minute or so until I tell you to stop. (Pause for 60 seconds.)

Very good. Now that we have relaxed you with the deep-muscle procedures, we are going to relax you further using

mental procedures. I am going to describe some scenes, sensation, and experiences for you as we proceed. I want you to follow along with what I describe and picture these things in your mind as clearly and vividly as you can. Follow along with me and do not get behind or ahead. Concentrate only on my voice, and experience the sensations of relaxation to the fullest.

Okay, . . . (identical with MR instructions relaxation scene section).

MENTAL RELAXATION INSTRUCTIONS

During the rest of this period, you will be learning a cognitive relaxation technique which has been utilized by psychologists in clinical settings. This is a technique that has been proven to be quite effective, and it is possible that you will find yourself learning to become more relaxed than you've ever been before. This procedure hinges on the fact that a person can use mental techniques to completely relax not only their mind but their body also. This is to say that the mind can completely relax an individual, thus making it impossible for them to experience tension or anxiety.

The way the procedure works is that I will instruct you to imagine various experiences, sensations, and images as I describe them to you. In addition, I will offer various suggestions of calm and relaxation as we proceed through the technique. What you are to do is concentrate only on my voice, clear all thoughts from your mind, and follow my instructions. When I ask you to picture or imagine something, I want you to do so as clearly and vividly as you possibly can. Follow along with me and progress at the pace I set for you; do not get ahead of me or behind me. As we go through the procedure, you will find yourself becoming more and more relaxed and comfortable. Focus on these relaxed

sensations and experience them to the fullest degree. Notice the differences between the feelings of tenseness and the feelings of relaxation.

Okay, we are ready to begin. Get comfortable in the chair, sit back completely, close your eyes and keep them closed until instructed to open them again. (Begin music.)

Now, I'd like you to picture a warm, pleasant fluid bathing your feet and ankles. This fluid is just the right temperature--not too warm or too cool, just right--and it feels very soothing and relaxing. As it bathes your feet and ankles, you can feel it washing away all the tensions and tightness in the muscles and replacing the tension with warm, soothing sensations of relaxation. The muscles are feeling very relaxed and comfortable, and as they relax, they begin to feel warm and heavy, warm and heavy--that's right, nice and relaxed and comfortable. Feel those relaxed sensations and notice the difference between tense muscles and relaxed muscles.

Now picture the warmth moving up your lower legs slowly, slowly and bathing your lower legs with warmth and relaxation. Now it's up to your knees and bathing your legs from the knees on down in sensations of relaxation. The muscles in your lower legs and feet are feeling very relaxed; all feelings of tightness and tension are gone, and in their place are sensations of pleasant, soothing, comfortable relaxation. Your legs from the knees on down are feeling very relaxed,

and they feel warm and heavy, warm and heavy and relaxed. That's right--notice how good it feels; notice the difference between tension and relaxation.

Now, the warmth again begins to move; slowly, slowly moving up the upper part of your legs. Feel it bathing your thigh muscles in warm, pleasant sensations of relaxation. It's moving up to your waist and bathing your legs in warm, soothing sensations of relaxation. . . .

(Continue in same manner utilizing similar patten until entire body has been covered. Progress up torso specifying stomach and lower back muscles, chest and upper back, shoulder and neck muscles. Pause at neck and go over torso and leg muscles to feet. Repeat patten at intervals. Progress then to arm, upper and lower muscles, down to finger tips. Progress then to head and facial muscles, covering muscles of chin, jaw, cheek, back of head, forehead, and to top of head. Upon completing, run back over muscles briefly, starting at toes and returning to top of head, using similar patten and instructions.)

Now that we have relaxed your entire body from the tips of your toes to the top of your head, I want you to take the next minute or two and experience the feelings of complete bodily relaxation. Notice the differences between what it feels to be relaxed, like you are now, and what it feels when you are tense, like you were when we started. Just get in touch with the sensations of relaxation coming from your

body. (Pause for 60 seconds.)

Now, for a few moments I would like you to concentrate on your breathing. Breathe at a nice, easy, slow pace and just concentrate on your breathing--nice and easy and relaxed. Very good. (60-second pause.) Now for the next minute or so I want you to say the word "relax" to yourself. Do it like this: Every time you exhale, say "relax" to yourself--just say "relax" to yourself every time you exhale. Good, now just do that to yourself for the next minute or so until I tell you to stop. (Pause for 60 seconds.)

Very good. Now that we have relaxed your body, we are going to relax your mind. We are going to do that by taking you to your personal relaxation spot, a spot where you will be totally and completely relaxed. Concentrate only on my voice, and remove all other thoughts from your mind. Now, I want you to picture yourself in a mountain meadow. Picture this very clearly in your mind. Let's look around your meadow. It's a big, wide, open meadow stretching away into the distance--a beautiful meadow. It's covered with tall grass, deep green in color, and the grass is waving in the breeze back and forth, back and forth, slowly and gently. Look at the tall, green grass. Now let's look at the sky, how beautiful it is; the sky is a clear, deep blue, the sun is shining, and a few white fluffy clouds are drifting lazily along. Feel the sun shining down, nice and warm--

just right, not too warm and not too cool--just right. Feel the gentle breeze blowing across the meadow, just a comfortable gentle breeze. Let's look around some more; we can see that all around the meadow a deep rich green forest is standing--a lush, beautiful forest with dark green, tall, stately trees. Off in the distance we can see some mountain peaks, high lofty peaks, kind of hazy gray in the distance and capped with white snow at their very tops. What a beautiful place; just look at it, a completely relaxing, peaceful, serene place. And now notice that through the meadow a brook is flowing, just meandering along. A small narrow brook with crystal clear water; deep, cool water that is absolutely pure. There's a pool in the brook, and in this pool a few fish are just lazily swimming around; they're just taking it easy and floating around in the pool. Everything in your meadow is relaxed and just going along at an easy pace. Nothing but calm and relaxation can exist here; tension and anxiety aren't allowed and just disappear. Just enjoy yourself; this is your spot, your own personal place of relaxation. (Briefly run through the scene again, describing the setting and repeating relaxation patten.)

Okay, now just concentrate on your meadow and get in touch with those feelings of relaxation you are now experiencing. Take the next few minutes to experience and enjoy being relaxed; notice what it feels like; discover what it

feels like to be relaxed. [At this time the post-treatment EMG data was gathered.]

I will now count backwards from four to one, and as I do, you will feel yourself beginning to become more and more alert. Four--move your legs; three--now your fingers and hands; two--move your head around; one--open your eyes and sit up.

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