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## The Effects of Music Listening and Progressive Muscle Relaxation on the Anxiety Level of Adjudicated Adolescent Males in a Residential Treatment Setting

Ned David Gladfelter

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**THE EFFECTS OF MUSIC LISTENING AND PROGRESSIVE MUSCLE  
RELAXATION ON THE ANXIETY LEVEL OF ADJUDICATED  
ADOLESCENT MALES IN A RESIDENTIAL  
TREATMENT SETTING**

by

**Ned David Gladfelter**

**A Thesis  
Submitted to the  
Faculty of The Graduate College  
in partial fulfillment of the  
requirements for the  
Degree of Master of Music  
School of Music**

**Western Michigan University  
Kalamazoo, Michigan  
June 1992**

**THE EFFECTS OF MUSIC LISTENING AND PROGRESSIVE MUSCLE  
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**Ned David Gladfelter, M.M.**

**Western Michigan University, 1992**

The purpose of this study was to determine the effects of music listening and progressive muscle relaxation on the anxiety level of adjudicated adolescent males. Sixty-five delinquent, adolescent males in a residential treatment facility took part in either a music listening treatment, a progressive muscle relaxation treatment (Bernstein & Borkovec, 1973), or a combination of both methods, and the effects of each approach on the self-perceived anxiety level of the subjects were determined.

The State-Trait Anxiety Inventory (Spielberger, 1983) and a Subjective Units of Discomfort Scale were used to measure levels of anxiety. Data gathered from these instruments revealed that adolescents who received the music listening treatment or the progressive muscle relaxation treatment alone had significant reductions in state anxiety. However, when both methods were combined, significant reductions in state anxiety failed to occur consistently indicating that this combined treatment method for anxiety reduction may be less effective.

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Finally, I dedicate this thesis to my family and friends who have been hearing about this thesis for some time now. I am looking forward to spending more time with all of you.

Ned David Gladfelter

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**Western Michigan University, 1992**

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## CHAPTER I

### INTRODUCTION

The adolescent years can be described as a transitional period at which time an individual experiences many physical, social and cognitive changes while developing into an adult. Since these changes may be stressful, the adolescent years are often a period characterized by a high degree of anxiety.

The effects of stress and anxiety on human behavior have been widely recognized (Hanser, 1985). For the adolescent who is unprepared to deal with the challenges of this age, stress can lead to "acting out" behaviors, poor grades, dropping out of school, and poor preparation for adult life (D'Onofrio & Kleese, 1990). In a study conducted by Bernstein, Garfinkel, and Hoberman (1989) 1000 adolescents were interviewed in an effort to identify common characteristics among the respondents that could be linked with high anxiety. They found that a history of physical and sexual abuse, poor grades, and use of street drugs were among factors that differentiated adolescents' reporting high anxiety from those reporting low anxiety.

Strauss (1990) found that anxiety in adolescence often is accompanied by other forms of maladjustment, including impaired social relationships, depression, and other behavior problems. Some of the adolescents who fail to deal with this anxiety have a great amount of difficulty in school (truancy, fighting, stealing, and lying), in their community, and often with the law, which can eventually lead them to placement in residential treatment.

In particular, adjudicated adolescents with behavior disorders, such as those in a residential treatment setting, need to be exposed to techniques which will help them to decrease their level of anxiety so they can function more effectively in life. Relaxation techniques can serve this purpose (D'Onofrio & Kleese, 1990). Much research has

been done using relaxation techniques to reduce anxiety, although very little has focused on the adolescent population.

Two techniques, music listening and progressive muscle relaxation, have been found to be effective in reducing levels of anxiety (Kibler & Rider, 1983; Liebman & MacLaren, 1991; Stoudenmire, 1975). However, very little research has been done to determine the interactive effects of music on progressive muscle relaxation.

### Statement of the Problem

The purpose of this study, therefore, was to determine the effects of music listening and progressive muscle relaxation on the anxiety level of adjudicated adolescent males in a residential treatment setting. Treatments consisted of music listening alone, progressive muscle relaxation alone, and a combination of both music listening with progressive muscle relaxation. Not only was this study intended to determine the effects of these treatments, but it also intended to shed some light on the type of music that the adolescent population found to be most relaxing. Anxiety level was determined by psychological (State-Trait Anxiety Inventory, Spielberger, 1983) and self-report (Subjective Units of Discomfort - SUD) measures.

## CHAPTER II

### REVIEW OF RELATED LITERATURE

#### Progressive Muscle Relaxation

Progressive muscle relaxation (PMR) is one relaxation technique which can be employed with the adolescent experiencing high anxiety from stressful situations. There is a substantial amount of clinical research supporting the use of PMR in anxiety treatment (Israel & Beiman, 1977; Johnson & Spielberger, 1968; Lichstein, 1988; Miller, Murphy, & Miller, 1978).

The Progressive Muscle Relaxation (PMR) technique used today evolved in two distinct phases. The first phase began with the work of Edmund Jacobson, who in 1934 developed a physiological method of relieving tension and anxiety (Jacobson, 1974). In Jacobson's method, progressive relaxation involved relaxing only two or three muscle groups per session until some fifty groups covering the entire body had been relaxed. Typically, it required three to six months to achieve complete mastery of the technique.

This was followed by a second phase, initiated by Joseph Wolpe, who modified Jacobson's technique for use in systematic desensitization (Lichstein, 1988). Wolpe shortened Jacobson's procedure down to about six sessions, primarily by omitting many of the small muscle groups included in the original format. By the 1960s the procedure had been condensed further by Wolpe, due to the need for time economy. This latter form relaxes about fifteen muscle groups in approximately twenty minutes. Since Wolpe's adoption of PMR for systematic desensitization, interest in this technique has grown substantially. The procedure described by Bernstein and Borkovec (1973) most accurately reflects the relaxation technique used in the past several decades.

Progressive muscle relaxation involves the systematic tensing and relaxing of

specific muscle groups, with the subjects becoming increasingly familiar with the tension level of all of the muscles in the body. PMR mainly emphasizes the physiological mode of relaxation, but it also diverts attention away from troubling thoughts, so that secondary benefits are obtained in the cognitive mode as well.

Jacobson (1974) and others (Johnson & Spielberger, 1968; Kibler & Forman, 1983) have found PMR to be an effective procedure for reducing anxiety and muscle tension. Effects of the PMR technique on state and trait anxiety have been the focus of several research studies. State anxiety refers to a subjects current level of anxiety which can vary in degree from moment to moment, while trait anxiety refers to relatively stable individual differences in anxiety-proneness (Spielberger, 1983).

Hoelscher, Lichstein, and Rosenthal (1984) conducted PMR training sessions with twenty volunteers from the community determined as anxious, and found significant pretest to posttest reductions in the State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lushene, 1970). Reductions in state anxiety were also found in studies using dental patients (Miller, Murphy, & Miller, 1978) and male psychiatric patients (Johnson & Spielberger, 1968). Using systolic blood pressure, heart rate, and the Zuckerman Adjective Checklist as state anxiety measures, Johnson and Spielberger found that scores for all three state measures declined significantly in response to PMR procedures, while trait measures (Taylor Manifest Anxiety Scale and the Adjective Checklist) remained unaffected by relaxation training. Other research (Stoudenmire, 1972, 1975) has also found that relaxation effects on anxiety are confined to state changes.

### Music Listening

Another relaxation technique which has gained attention in anxiety reduction research is music listening. In much of the literature involving music listening and stress reduction, anxiety is defined through changes in the sympathetic and autonomic nervous system (Hanser, 1985). Many physiological changes have been measured



including heart or pulse rate, galvanic skin response, blood pressure, skin temperature, muscular tension, and electromyography (EMG).

Using galvanic skin response as a physiological measure of anxiety, Peretti and Swenson (1974) found that listening to music did decrease the galvanic skin response of the finger in a small group of college students exposed to one of four treatment conditions: music, verbal suggestion, music and verbal suggestion, or silence control. All of the subjects, through self-report, revealed that they perceived themselves to be more relaxed. Scartelli conducted a series of studies (1982, 1984; Scartelli & Borling, 1986) where EMG readings were used as the dependent variable and found that a decrease in microvolts occurred as a result of exposure to music. The subjects also confirmed the effectiveness of music to promote relaxation through self-report questionnaires.

Because the meaning of many physiological measurements tends to be difficult to interpret, inconsistent physiological results have caused much controversy. Researchers have achieved more consistent findings using psychological scales (Hanser, 1985). These self-report measures based on client perceptions take on a variety of forms.

Several psychological tests have been developed to measure anxiety. One of the most basic psychological measures is the Subjective Units of Discomfort (SUD) Scale. This measure requires a person to subjectively evaluate current feelings of anxiety on a numerical scale. The rating of ten is assigned to the greatest discomfort the subject can imagine feeling, while a rating of one represents no discomfort. This method of measurement has been used in many studies involving relaxation techniques (Logan & Roberts, 1984; Stratton & Zalanowski, 1984; Thaut, 1989).

The State-Trait Anxiety Inventory (STAI; Spielberger, 1983) is one commonly used psychological test for measuring anxiety. It was developed to measure two types of anxiety; state and trait. State anxiety reflects the subjective feelings of tension, apprehension, and anxiety that the subject is currently experiencing. Trait anxiety reflects the subject's characteristic, or long-standing pattern of anxiety reactions. The

psychometric properties of the STAI indicate that it is a reliable and valid measure of anxiety (Sandrock & James, 1989). In a meta-analysis of relaxation techniques on trait anxiety, Eppley, Abrams, and Shear (1989) found that the STAI was used most often and has been well-validated in hundreds of studies.

The research literature examining the effects of music on state and trait anxiety substantially supports the case for the effect of a music intervention on state anxiety. Biller, Olson, and Breen (1974) classified one selection of music as “happy” and one selection as “sad” and found that subjects exposed to “sad” music showed greater decreases in state anxiety than those exposed to “happy” music. In a similar fashion, Davis and Thaut (1989) found that listening to music preferred by the subject was effective in reducing state anxiety and enhancing relaxation of college students. Stoudenmire’s (1975) findings give further evidence that muscle relaxation and music reduce state anxiety, but neither reduce trait anxiety. These results support Spielberger’s state-trait theory that brief anxiety reduction techniques are effective for state, but not trait anxiety.

Although the use of music to reduce anxiety has been documented in published research (Hanser, 1985), there is some disagreement in determining the type of music which best facilitates anxiety reduction. The initial criterion used to identify the music most likely to relax subjects was based on Gaston’s (1951) definition of stimulative and sedative music. Gaston defined sedative music as having a sustained, melodic nature, with a lack of strong rhythmic and percussive elements. Stimulative music was defined as music which enhanced bodily energy and induced bodily action.

Using stimulative music, sedative music, and a no music control, Smith and Morris (1976) found that stimulative music kept anxiety at an elevated level for college students taking a test, while the sedative music and a no music control caused decreases in anxiety. Using similar sedative and stimulative classifications, Rohner and Miller (1980) found that the sedative music decreased self-report anxiety slightly more than did stimulative music, but the differences were not significant.

To further determine how individuals respond to music precategorized as

stimulative or sedative by Gaston's definition, Taylor (1973) had thirty college students and staff rate ten samples of music. Findings revealed that listeners did not rate the music according to its precategorized style. Taylor concluded that music should only be classified as stimulative or sedative after its effects on the listener have been determined, since all subjects do not respond identically to a musical selection. Using a larger sample of college students, and more musical selections, Hadsell (1989) came to the same conclusions.

Some studies showed no differing effect when different types of music were utilized. Using jazz, rock, classical, minimalistic, and silence treatments, Marshall and Tomcala (1981) found no difference in anxiety reduction, as measured by EMG biofeedback, among the four types of music and the silence condition. In a similar fashion, Stratton and Zalanowski (1984) used soothing classical, stimulative classical, romantic, atonal, easy listening, and a silent control condition as treatment with college students. They also found, using self-report questionnaire, that no single type of music was more effective in aiding relaxation. In fact, consistent with other findings (Barger, 1979; Logan & Roberts, 1984) was the realization that the music conditions were not significantly different from the silent (no music) control groups.

The single factor most closely related to relaxation was the degree of liking for the music (Stratton & Zalanowski, 1984). Subjects who liked the music the most were significantly more relaxed than were the subjects who liked the music the least. Davis and Thaut (1989) allowed subjects to provide the music for relaxation, and found that listening to preferred music was effective in reducing state anxiety and enhancing relaxation.

### Music Listening and Progressive Muscle Relaxation

There have been few research studies which have looked at the effect that music has had on the PMR technique. Liebman and MacLaren (1991) combined music with PMR in a study to determine the effects of a music and relaxation intervention on

anxiety levels of pregnant adolescents. The treatment involved a condensed version of the PMR technique by Bernstein and Borkovec (1973), accompanied by music chosen by the experimenter. Using the STAI as the dependent measure of anxiety, they found that the treatment was effective in reducing state anxiety during adolescent pregnancy, and that trait anxiety was not affected by treatment.

Stoudenmire (1975) found similar results using female undergraduate psychology students as subjects. He investigated the effects of muscle relaxation and relaxing music on state and trait anxiety using Spielberger's STAI as a dependent variable. Subjects received PMR only or music listening only. Results revealed that the PMR group showed a somewhat greater decrease in anxiety than the music group, with both types of treatment significantly reducing state anxiety, but neither reducing trait anxiety.

A study which actually measured the interactive effects of music and PMR was conducted by Kibler and Rider (1983). This study used a physiological measure, finger temperature response, to determine the effects of three types of treatment: PMR only, music only, or PMR and music. Using undergraduate and graduate students in an introductory music course, significant increases in finger temperature were found in all three groups immediately after treatment, with the PMR and music group appearing to have a more relaxing effect over the other types of treatment.

### Statement of Hypotheses

The research evidence suggests that both the PMR technique and music listening (alone or together) can reduce anxiety, particularly if the music is perceived by the subjects to be relaxing. Furthermore, it seems that these relaxation techniques have more impact on state anxiety than on trait anxiety. It would seem then, that these techniques could be used to effectively reduce state anxiety, as determined by the State Anxiety Inventory and SUD scale, for adjudicated adolescent males in a residential treatment program. Therefore, the following null hypotheses were developed:

1. There will be no significant difference between the pretest and posttest scores of the State Anxiety Inventory for the subjects who receive the progressive muscle relaxation treatment across all four sessions.

2. There will be no significant difference between the pretest and posttest scores of the State Anxiety Inventory for the subjects who receive the music listening treatment across all four sessions.

3. There will be no significant difference between the pretest and posttest scores of the State Anxiety Inventory for the subjects who receive the progressive muscle relaxation with music listening treatment across all four sessions.

4. There will be no significant difference between the pretest and posttest scores of the Subjective Units of Discomfort Scale for the subjects who receive the progressive muscle relaxation treatment across all four sessions.

5. There will be no significant difference between the pretest and posttest scores of the Subjective Units of Discomfort Scale for the subjects who receive the music listening treatment across all four sessions.

6. There will be no significant difference between the pretest and posttest scores of the Subjective Units of Discomfort Scale for the subjects who receive the progressive muscle relaxation with music listening treatment across all four sessions.

7. There will be no significant difference between the posttest State Anxiety Inventory Scores of the three treatment conditions (PMR alone, Music alone, or PMR with Music) across all four sessions.

Previous research suggests that brief anxiety reducing techniques, such as the ones used in this study, have no effect on trait anxiety. Therefore the following null hypotheses were developed in regards to trait anxiety:

8. There will be no significant difference between the pretest and posttest scores of the Trait Anxiety Inventory for the subjects who receive the progressive muscle relaxation treatment.

9. There will be no significant difference between the pretest and posttest scores of the Trait Anxiety Inventory for the subjects who receive the music listening

treatment.

10. There will be no significant difference between the pretest and posttest scores of the Trait Anxiety Inventory for the subjects who receive the progressive muscle relaxation with music listening treatment.

11. There will be no significant difference between the posttest Trait Anxiety Inventory Scores of the three treatment conditions.

The literature also suggests that the subjects' degree of liking of the music, and perception of how relaxing they find the music that is used, affects the outcomes of the treatment. Therefore it was also hypothesized that:

12. There will be no significant correlation between the subjects rating of how much they like the music and rating of how relaxing they find the music used in the study.

## CHAPTER III

### METHOD

#### Subjects

Subjects for this study were selected from a population of 120 adolescent males, ranging in age from 15-18 years, who were residents in a private, treatment facility for adjudicated adolescent males in south-central Michigan. The mean age of the subjects involved in this study was 16.3 years. Two thirds of the subjects represented minority ethnic groups, with African-American representing the largest group. The youth predominantly came from single-parent homes and 11% of them had been neglected or sexually or physically abused. At the start of this study, the average length of stay in the facility for the subjects was 6.5 months.

The majority of the subjects abused both alcohol (73%) and marijuana (66%) prior to admission to the facility. Most of the students came from a public school setting where nearly all of them had histories of chronic truancy and had experienced serious disciplinary action. Nearly all (99%) of the youth had been arrested and convicted for delinquent crimes. Their predominant offenses included larceny, burglary, truancy, and assault.

Youth at the treatment facility were assigned to one of two treatment centers, called "villages." Each village consisted of groups to which youths were assigned. Each group consisted of twelve youths who resided in an on-campus home referred to as a "cottage." Cedar Village consisted of five cottage groups (60 youths) and Lakeview Village also consisted of five cottages (60 youths). Studies (Gold, 1982; Longhurst, 1987) previously conducted at the facility established that placement into the groups was random. Youths from these two villages were found to be very similar in terms of profile characteristics, including age, ethnicity, drug abuse, and average

number of adjudications. Six intact cottage groups were selected to participate in the study. The members of these groups remained consistent throughout the entire length of the study.

### Consent and Approval

The research project was proposed to the Director of the Research and Evaluation Department of the Starr Commonwealth Schools. The proposal was approved (Appendix A), indicating that the proposed project met the criteria set forth in the Research Approval Procedure at the Starr Commonwealth Schools. Approval was also granted from the Western Michigan University Human Subjects Institutional Review Board upon completion of the Human Subjects Approval Form (Appendix A).

Once approval was granted to begin research, six cottage groups were randomly selected and the procedure to gather informed consent from the subjects and their parents/guardians was implemented. Before the subjects were notified about this study, informed consents were gathered from the subjects' parents/guardians. Family service workers, who have regular contact with the subjects' families, were given an orientation about the research project to help them respond consistently to parental inquiries. They reviewed the Description and Purpose of Study Form with each parent and requested their consent (Appendix B). All but two parents agreed to have their children participate.

After consent was received from the parents/guardians, the investigator met with each cottage group individually and explained the purposes of the project to the subjects. Each subject was provided with the appropriate Informed Consent Form (Appendix B) which outlined the overall project. All subjects were asked to read and sign the form. All 65 subjects gave their consent to participate.

### Experimental Design

Six cottage groups, from the ten available, were randomly selected to be



involved in this study. Of these six groups, two were randomly assigned to each of the treatment conditions: (a) progressive muscle relaxation only, (b) music listening only, or (c) progressive muscle relaxation with music listening. This resulted in 23 subjects in the progressive muscle relaxation treatment group, 23 in the music listening treatment group, and 19 receiving progressive muscle relaxation combined with music listening. Thus, a three group comparison design with pretest and posttest measures was implemented for the purposes of this study.

### Materials

Taped cassette recordings were used in order to insure uniformity for each of the treatment groups. The independent variables, the progressive muscle relaxation dialogue and the music, were recorded onto separate tracks of a Tascam (Montebello, California), MiniStudio multitrack cassette recorder, model number - Porta One.

The 20-minute recording of the progressive muscle relaxation technique (Bernstein & Borkovec, 1973), was recorded by the investigator onto one track (A complete description of the dialogue can be found in Appendix C). Subjects receiving the PMR treatment heard only this track in their relaxation sessions.

The music track included some brief dialogue introducing the subjects to the music listening session, which was inserted immediately before the music began (Appendix C). Subjects receiving the music listening treatment heard only this track in their relaxation sessions. The musical selections (in the order they were recorded onto the tape) are presented in Table 1.

The progressive muscle relaxation track and the music track (without the introductory dialogue) were then combined for the subjects receiving the PMR and music listening condition.

All tapes were played on a JVC (Tokyo, Japan) Stereo Cassette Deck (Model TD-W10), attached to a Peavey (Meridian, Mississippi) Amplifier (Centurion-Mark III Series) with two 8-Ohm, 150-Watt Peavey speakers. The volume controls were set

identically (#2 on the dial) for every treatment group each session.

Pillows and padded mats were used to insure the comfort of the subjects during the relaxation sessions. Each subject had his own mat and pillow. The mats were placed approximately five feet apart in a circular fashion in a large, carpeted room lit by two, 75-watt bulb lamps.

Table 1  
Musical Selections Used in Experimental Conditions

- 
- |  |                                               |
|--|-----------------------------------------------|
|  | 1. Najee (1988) "That's The Way of The World" |
|  | 2. David Benoit (1990) "Six String Poet"      |
|  | 3. David Benoit (1990) "Deep Light"           |
|  | 4. David Benoit (1990) "A Last Request"       |
|  | 5. Najee (1988) "That's The Way of The World" |
- 

### Instruments

Two psychological measures were used as dependent variables in this study. The State-Trait Anxiety Inventory (STAI), Forms Y-1 (State) and Y-2 (Trait), were used as psychological assessments. The STAI consisted of 40 brief items. Twenty items on form Y-1 assessed how the subjects felt at the moment of testing. The other twenty items on form Y-2 assessed how the subjects generally felt.

The STAI was designed for use with high school students, in addition to college students and adults, and required only a fifth grade reading ability to spontaneously respond to all of the STAI items without special instructions or prompting. All of the subjects in this study were assessed as having the ability to read at this level.

Norms for both the state and trait scales were provided for high school students, college freshman, university undergraduates, neuropsychiatric patients,

general medical and surgical patients, prison inmates, and working adults. Test-retest reliability for the trait scale for male high school students over 30 and 60 days was .71 and .68, respectively. For college-age males, trait correlations were somewhat higher, ranging from .73 to .86. For the state anxiety scale, the stability coefficients for college and high school males were relatively low, ranging from .33 to .62. Relatively low stability coefficients were expected for the state anxiety scale because a valid measure of state anxiety should reflect the influence of unique situational factors that exist at the time of testing.

Given the transitory nature of anxiety states, measures of internal consistency provide a more meaningful index of the reliability of state anxiety than test-retest correlations. Internal consistency of the state scale for high school males, measured by the alpha coefficient was .86. The trait scale alpha coefficient was .90. The internal consistency of both the trait and state scales was quite high. The overall median alpha coefficients for the state anxiety and trait anxiety scales for form Y in the normative samples was .92 and .90 respectively.

The validity of the state and trait scales has been demonstrated in a wide variety of studies (Buros, 1978). Evidence of concurrent, convergent, divergent, and construct validity of the STAI scales was presented in the manual (Spielberger, 1983). Validities for trait scores were estimated by correlating the scores with the IPAT Anxiety Scale, Manifest Anxiety Scale, and the Affect Adjective Checklist. The overall coefficients were .75, .80, and .52 respectively.

In addition to the State Trait Anxiety Inventory, a Subjective Units of Discomfort (SUD) measure was also utilized in this study (Appendix D). The SUD measure required the subjects to evaluate current feelings of anxiety on a numerical scale. The rating of ten was assigned to the greatest discomfort the subject could imagine, while a rating of one represented no discomfort. The validity and sensitivity of the subjective procedure has been previously documented (Achterberg, Kenner, & Casey, 1989).

## Procedure

The entire study took part in two phases. Phase I included a music selection process which identified preferred musical styles of the subjects in regards to relaxation. The music identified in the first phase was then used in Phase II, which involved the three experimental treatment groups receiving music listening only, progressive muscle relaxation only or PMR with music listening.

### Phase I: Music Selection Process

This phase of the study occurred two weeks before the second phase, and included the 42 subjects that were to be in either of the treatment groups receiving music listening in Phase II. Research by Taylor (1973) and Stratton & Zalanowski (1984) stressed the importance of determining the effects of the music on the listener before it was used to promote relaxation. Therefore, the purpose of this phase was to determine which type of music the subjects found to be most relaxing.

Three genres of music, which had been used in previous relaxation research, were selected for this study. The genres of music included: (a) Classical (old, Western European), (b) New Age (electronically produced), and (c) Jazz (contemporary ensemble with traditional instrumentation).

Classical music had been used in studies by Davis & Thaut (1989), Kibler & Rider (1983), Marshall & Tomcala (1981), Rider, Floyd, & Kirkpatrick (1985), Rohner & Miller (1980), Scartelli (1984), Scartelli & Borling (1986), Smith & Morris (1976), Stratton & Zalanowski (1984), and Taylor (1973). After reviewing the research, this seemed to be the most common genre of music selected for relaxation. Therefore it was included in this study. The classical selection used was "Canon in D" by Johann Pachelbel (Paillard, 1987). This selection was part of a relaxation tape produced specifically for relaxation.

Electronically produced, or new age music, was also cited in several research studies involving relaxation and anxiety reduction. Studies by Liebman and MacLaren

(1991), Hadsell (1989), and Logan and Roberts (1984) all utilized this genre, and found it to be effective for relaxation with a variety of subjects. The new age selection chosen for this study was "Lazarus Remembers Lemuria" by Steve Boone (Moeller, 1985). This piece had been used previously by the researcher in music therapy work with adolescents and was verbally reported to be very relaxing by this population.

The jazz genre was included in research by Davis and Thaut (1989), Marshall and Tomcala (1981), Rider (1985), Scartelli (1982), and Smith and Morris (1976). Since jazz was a more familiar style of music than the previous two genres to the majority of adolescents in this study, it was also included. The jazz selection was by saxophonist, Najee(1988), "That's the Way of the World." It contained the elements of sedative music put forth by Gaston (1951), and from the researchers prior experience, was a popular piece with the adolescent population.

To assess how the subjects responded to each genre of music, the researcher met with each group of subjects during one 20 minute session. (The dialogue that was used by the researcher during this session can be found in Appendix E.) After some initial discussion about the purpose of the session, a music preference for relaxation form (Appendix E) was explained to the subjects. They were then instructed to move to one of the stations in the room, which consisted of a padded mat, a pillow, a pencil, and the music preference for relaxation form. The subjects were then exposed to a three minute sample of each musical selection. After listening to each sample, the subjects were instructed to complete the music preference form. In addition to revealing how relaxing the subjects thought the music was, they were also asked to rate how much they liked each sample of music. The subject's degree of liking was taken into consideration since the degree of liking for the music was found to be an important factor in previous research (Davis & Thaut, 1989; Stratton & Zalanowski, 1984). After listening to all three samples of music, the forms were collected and the subjects were excused from the session.

## Phase II: Experimental Conditions

During the second phase of this study, each treatment group met once a week in a 30-minute session, for a period of four weeks. During the initial session, the subjects were introduced to the method of relaxation to which they were assigned: (a) progressive muscle relaxation, (b) music listening, or (c) progressive muscle relaxation with music listening. For the subjects involved with progressive muscle relaxation, a brief explanation of the technique occurred during the first session (Appendix F).

Upon arrival to the session, subjects were asked to move to one of the stations in the room. There was one station for each subject, consisting of a padded mat, a pillow, a pencil, and the dependent measures (Form Y-1 of the State Anxiety Inventory and the SUD scale). Once at a station, subjects were instructed to no longer interact with one another (verbally or physically) until after the session.

The trait anxiety inventory (Form Y-2) was not administered each session, but was administered at the beginning of the first session (before treatment occurred) and again at the end of the final session (after four weeks of treatment). This was to see if the overall treatment had any effect on the long-term, trait anxiety of the subjects. The state anxiety inventory and the SUD scale, on the other hand, were administered each session as pretest and posttest measures to determine the effects of treatment on the state anxiety of the subjects.

Each session began with the subjects completing the pretest state anxiety inventory and SUD scale. Once completed, the subjects got comfortable on their mat (removing shoes and glasses if desired). The appropriate tape was then begun for each relaxation session. At the conclusion of the tape, the investigator instructed the subjects to complete the posttest state anxiety inventory and SUD scale. The subjects were then excused from the session.

## CHAPTER IV

### ANALYSIS AND RESULTS

#### Analysis

All data were analyzed using the StatView II computer program (Abacus Concepts, 1987). For the purpose of this study, the .05 level of significance was selected for all statistical testing.

In the first phase of the study, the music selection process was based on the means derived from each group. The only statistical procedures applied to this data involved a correlation coefficient to test the twelfth hypothesis listed in Chapter II.

In the second phase of the study, the main statistical treatment of data involved the *t*-test for mean differences and analysis of variance (ANOVA). These statistical procedures were applied to the data to test hypotheses 1-11.

#### Results

##### Phase I: Music Selection Process

The means and standard deviations for each sample of music used in this phase of the study can be seen in Table 2. Subjects rated each sample as to whether they liked the selection and whether it was relaxing. Examination of the means reveals that the jazz selection received the most favorable rating in both the like and relax category for both the music group and the PMR and music group. However, the music group showed a greater degree of both liking and relaxing for the jazz sample than the PMR and music group (see Figure 1.)

Since the purpose of the first phase was to determine which type of music the subjects perceived to be most relaxing and most likeable, the selection with the lowest

rating in both areas was chosen for the experimental conditions in Phase II. As a result, the jazz genre was used in the second phase of this study.

Table 2  
Means and Standard Deviations for Each Sample of Music Used in Phase 1

		Musical Selection					
		Classical		New Age		Jazz	
		Like	Relax	Like	Relax	Like	Relax
Music Group							
<i>M</i>		2.27	1.91	2.50	1.95	1.14	1.18
<i>SD</i>		1.24	1.06	1.34	1.29	0.35	0.50
PMR & Music Group							
<i>M</i>		2.36	2.09	2.09	1.91	1.68	1.77
<i>SD</i>		1.33	1.15	1.27	1.15	1.25	1.27

The twelfth hypothesis listed in Chapter II is the only one directly related to this phase of the study. It concerned the relationship between the subject's degree of liking of the jazz music that was chosen to be used in Phase II, and the subject's perception of how relaxing they found that same music.

**Hypothesis 12:** There will be no significant correlation between the subject's rating of how much they like the music and rating of how relaxing they find the music used in the study.

Using data collected from Phase I, the subject's rating of how much they liked the music was correlated with the subject's rating of how relaxing they found the music. A significant, positive relationship between the subjects rating of how much they liked the jazz music and how relaxing they perceived the jazz music can be seen



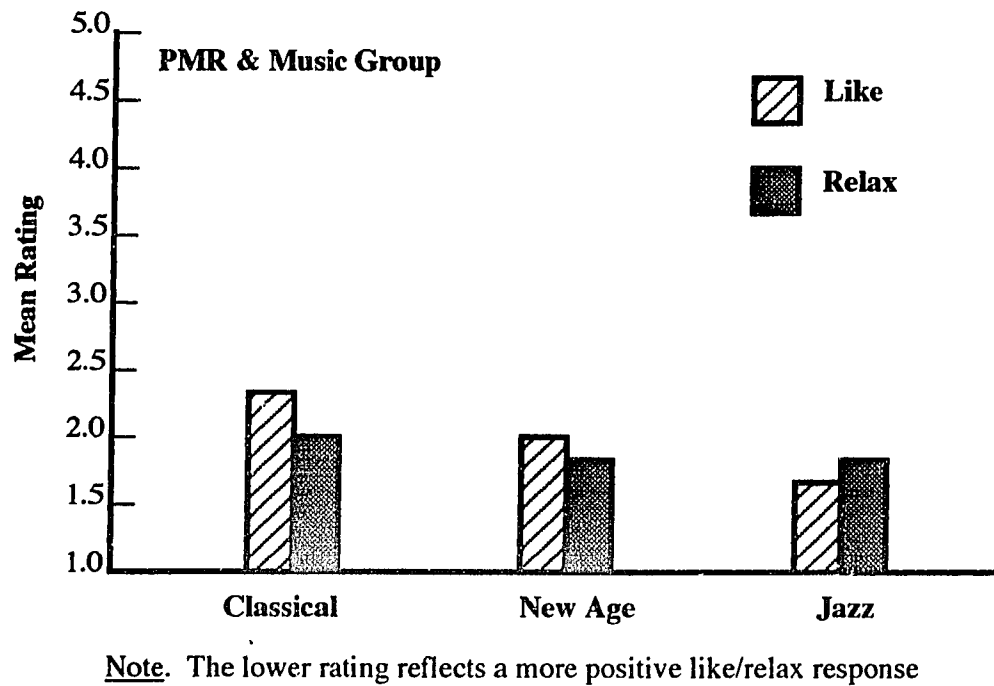
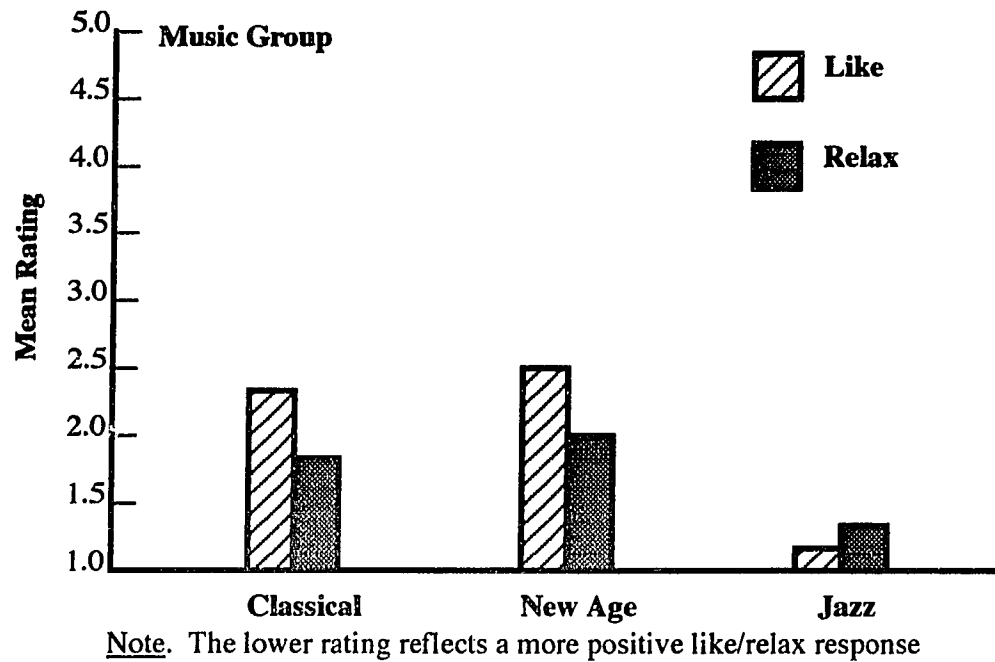


Figure 1. Mean Ratings of the Music Used in Phase I: Music Selection Process.

from the results in Table 3. Therefore, the twelfth hypothesis was rejected.

Table 3  
Correlation Between Like and Relax Scores of Jazz Music Selected for the Study

Group	N	Correlation
Music Group	22	.6641*
PMR & Music Group	19	.7906*

\*Significant at the .05 level.

#### Phase II: Experimental Conditions

In the second phase of this study, the treatment conditions were presented in four consecutive sessions for each of the three treatment groups. Therefore, hypotheses 1-7 were tested four times, once for each session.

Hypothesis 1: There will be no significant difference between the pretest and posttest scores of the State Anxiety Inventory for the subjects who receive the progressive muscle relaxation treatment.

The means and standard deviations for the pretest and posttest State Anxiety scores for each session can be seen in Table 4. State Anxiety Inventory scores can vary from a minimum of 20 to a maximum of 80. A higher state score reflects a higher level of anxiety, while a lower score reflects less anxiety. Examination of the means indicates that the State Anxiety score decreased after the PMR treatment in each session. It should also be noted that the pretest scores remained fairly consistent across sessions, while the posttest scores increased slightly with each additional session.

To determine if there was a significant difference among the means for each session, a paired *t* test was used to compare the pretest scores with the posttest scores (Table 4).

Table 4

Means, Standard Deviations and *t* scores for the PMR Treatment Group on the Pretest and Posttest State Anxiety Scores

PMR Treatment	Session			
	1	2	3	4
Pretest				
<i>M</i>	40.13	41.46	41.44	40.65
<i>SD</i>	10.08	11.84	11.41	9.56
Posttest				
<i>M</i>	33.61	34.32	35.22	36.65
<i>SD</i>	8.17	11.64	10.95	10.93
Comparison				
<i>t</i>	2.75*	3.85*	3.51*	2.39*

\*Significant at the .05 level.

It was found that all of the scores differed significantly in each session. Therefore, the first hypothesis was rejected.

Hypothesis 2: There will be no significant difference between the pretest and posttest scores of the State Anxiety Inventory for the subjects who receive the music listening treatment.

The means and standard deviations of the State Anxiety Scores for the music listening group can be seen in Table 5. The posttest scores also decreased for this group in each session after treatment. However, the pretest means were considerably higher for this group than they were for the PMR treatment group. The means also varied from one session to another. Using a paired *t* test to compare the pretest and posttest means revealed a significant difference in each session. Therefore, the second

Table 5

Means, Standard Deviations and *t* scores for the Music Listening Treatment Group on the Pretest and Posttest State Anxiety Scores

Music Listening Treatment	Session			
	1	2	3	4
Pretest				
<i>M</i>	48.14	46.73	49.22	43.74
<i>SD</i>	11.78	12.51	13.55	9.91
Posttest				
<i>M</i>	39.09	35.50	41.09	36.13
<i>SD</i>	10.24	13.05	9.55	9.42
Comparison				
<i>t</i>	5.69*	5.03*	2.94*	3.89*

\*Significant at the .05 level.

hypothesis was also rejected.

Hypothesis 3: There will be no significant difference between the pretest and posttest scores of the State Anxiety Inventory for the subjects who receive the progressive muscle relaxation with music listening treatment.

Of the three treatment groups, this group showed the most inconsistent results. As can be seen in Table 6, the pretest mean scores increased with each session, whereas the posttest scores first increased, and then decreased through the fourth session. As a result, the *t* test revealed that there was no significant difference between the pretest and posttest scores in the first two sessions, but there was a significant difference in the last two sessions. Since not every session resulted in a significant difference, the third hypothesis was accepted.

Table 6

Means, Standard Deviations and *t* scores for the PMR With Music Listening Treatment Group on the Pretest and Posttest State Anxiety Scores

PMR with Music Treatment	Session			
	1	2	3	4
Pretest				
<i>M</i>	38.74	41.68	44.21	45.00
<i>SD</i>	9.72	11.96	8.97	7.94
Posttest				
<i>M</i>	34.79	41.16	38.16	36.84
<i>SD</i>	11.78	9.90	10.10	11.35
Comparison				
<i>t</i>	1.54**	0.20**	2.98*	3.85*

\*Significant at the .05 level.

\*\*Not Significant at the .05 level.

After looking at the overall State Anxiety Inventory scores from this study, the results can also be compared to the State Anxiety norms generated by Spielberger (1983) in the Manual for the State-Trait Anxiety Inventory. Using a sample of 202 male, tenth grade high school students who took the State Anxiety Inventory during regular class periods, Spielberger determined a normative mean of 39.45 with a standard deviation of 9.74. When the pretest State Anxiety scores from this study are compared to Spielberger's normative mean, it can be noticed that all but one of the groups, the PMR with music treatment group in Session 1, scored higher than the normative mean. This provides support for the idea that this population of subjects generally displays a higher level of state anxiety than the normal population.

**Hypothesis 4:** There will be no significant difference between the pretest and posttest scores of the Subjective Units of Discomfort (SUD) Scale for the subjects who receive the progressive muscle relaxation treatment.

As with the State Anxiety scores, this group also remained fairly consistent with their mean pretest SUD scores across all of the sessions (Table 7). SUD scores ranged from a minimum of 1 to a maximum of 10, with 1 representing a very relaxed state and 10 representing a very tense state. All posttest means decreased after treatment. As a result, the *t* test, which compared the pretest and posttest SUD means for each session, reflected significant differences throughout the four weeks of treatment. The fourth hypothesis was therefore rejected.

Table 7

Means, Standard Deviations and *t* scores for the PMR Treatment Group  
on the Pretest and Posttest SUD Scores

PMR Treatment	Session			
	1	2	3	4
Pretest				
<i>M</i>	5.70	5.77	5.30	5.70
<i>SD</i>	2.74	2.96	3.17	2.96
Posttest				
<i>M</i>	3.04	3.64	2.91	3.70
<i>SD</i>	2.88	2.96	2.84	2.84
Comparison				
<i>t</i>	3.60*	3.23*	3.05*	2.61*

\*Significant at the .05 level.

**Hypothesis 5:** There will be no significant difference between the pretest and posttest scores of the Subjective Units of Discomfort (SUD) scale for the subjects who receive the music listening treatment.

As can be seen in Table 8, the pretest means for this group decreased consistently from the first session to the fourth session. Posttest means were considerably lower than the pretest means in every session. Hence, the *t* test comparison between pretest and posttest means revealed a significant difference among means for each session. The fifth hypothesis was also rejected.

Table 8

Means, Standard Deviations and *t* scores for the Music Listening Treatment Group on the Pretest and Posttest SUD Scores

	Session			
	1	2	3	4
<b>Music Listening Treatment</b>				
<b>Pretest</b>				
<i>M</i>	7.05	6.32	5.17	4.52
<i>SD</i>	2.70	3.05	3.17	2.43
<b>Posttest</b>				
<i>M</i>	3.09	2.41	3.04	2.35
<i>SD</i>	2.16	2.32	2.55	1.85
<b>Comparison</b>				
<i>t</i>	5.72*	5.97*	3.44*	3.80*

\*Significant at the .05 level.

**Hypothesis 6:** There will be no significant difference between the pretest and posttest scores of the Subjective Units of Discomfort (SUD) scale for the subjects who

receive the progressive muscle relaxation with music listening treatment.

Unlike the pretest State Anxiety means for this group, which increased each session, the pretest SUD means remained fairly consistent across sessions (Table 9). However, significant decreases in SUD scores were not evident in all of the posttest means. Comparisons between the pretest and posttest means using a *t* test revealed no significant difference in the fourth session. Although it should be noted that the *t* value in the fourth session was very close to being significant. There were significant differences noted in the first three sessions. These results run contradictory to the findings based on the State Anxiety scores from this group (Table 6), which revealed a significant difference in the third and fourth sessions, but no significant difference in

Table 9

Means, Standard Deviations and *t* scores for the PMR With Music Listening Treatment Group on the Pretest and Posttest SUD Scores

PMR with Music Treatment	Session			
	1	2	3	4
Pretest				
<i>M</i>	4.84	5.32	5.00	4.95
<i>SD</i>	2.24	2.65	2.47	2.84
Posttest				
<i>M</i>	2.68	2.53	4.00	3.32
<i>SD</i>	2.41	1.81	3.06	2.63
Comparison				
<i>t</i>	3.25*	4.57*	2.12*	1.93**

\*Significant at the .05 level.

\*\*Not significant at the .05 level.



the first two sessions. Since not all four sessions led to significant differences in the pretest and posttest means, the sixth hypothesis was accepted.

**Hypothesis 7:** There will be no significant difference between the posttest State Anxiety Inventory scores of the three treatment conditions (PMR alone, Music alone, or PMR with Music).

To compare the three treatment groups to see if there was a significant difference between treatments, the statistical procedure, analysis of variance, was employed. Using the posttest State Anxiety scores from all of the subjects in each treatment group, an ANOVA was performed for each session. The results can be seen in Table 10.

Table 10

Analysis of Variance Summary Table for Measures of Posttest State Anxiety Between the Three Treatment Groups for Each Session

	<i>df</i>	<i>MS</i>	<i>F</i>
Posttest State Anxiety			
Session 1	2	189.99	1.82**
Session 2	2	266.76	1.96**
Session 3	2	198.10	1.89**
Session 4	2	2.93	0.03**

\*\*Not significant at the .05 level.

Findings revealed that there was no significant difference between the three treatment groups in any of the sessions. Therefore the seventh hypothesis was accepted.

Although no statistical significance was noted between the three treatment groups based on posttest State Anxiety Inventory scores, some differences can be noted among the treatment groups when they are compared in another way. When the mean difference between the pretest and posttest State and SUD scores for each treatment

group are compared, the music listening group is found to exhibit the greatest decrease in anxiety across all four sessions (See Figure 2).

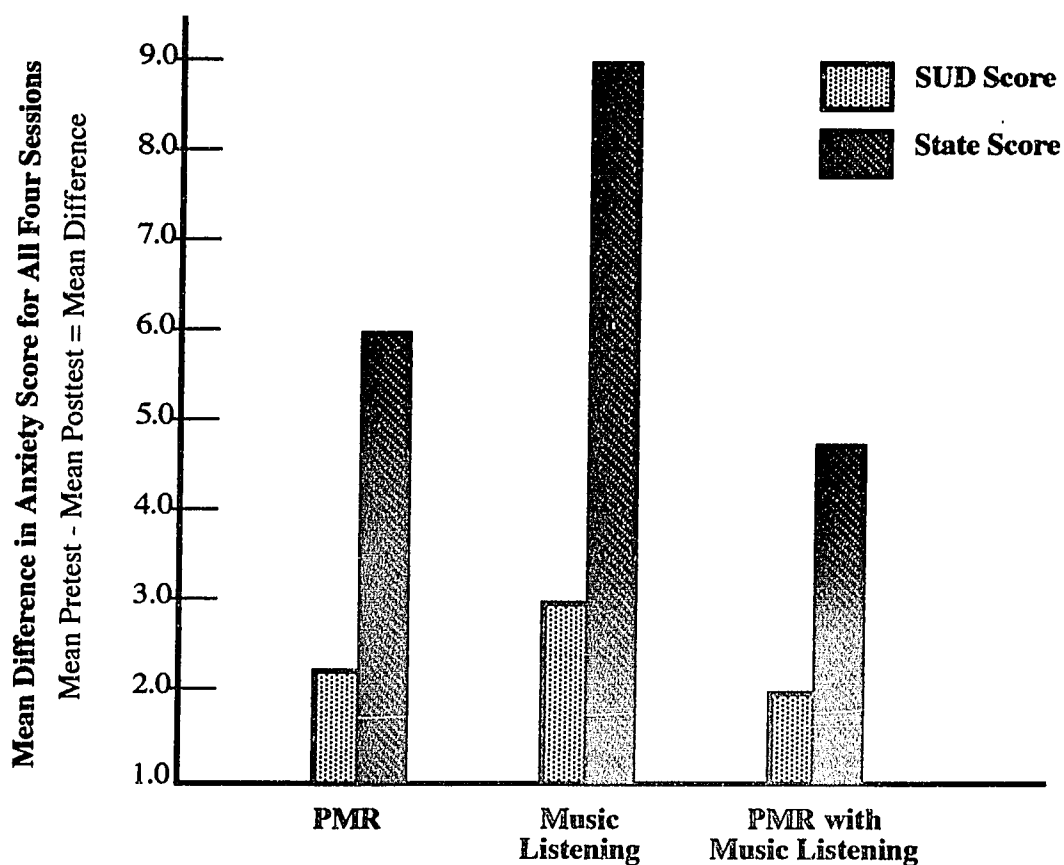


Figure 2. Reductions in State Anxiety for Each Treatment Group Based on SUD and State Anxiety Inventory Scores.

To determine what effect the treatment conditions used in this study had on the trait anxiety of the subjects, the Trait Anxiety Inventory, which was administered before the first session and after the fourth session, was utilized.

**Hypothesis 8:** There will be no significant difference between the pretest and posttest scores of the Trait Anxiety Inventory for the subjects who receive the progressive muscle relaxation treatment.

Results of the Trait Anxiety Inventory can be found in Table 11. As can be seen from the table, the PMR group had no variation in their pretest and posttest mean score. As a result, the *t*-test comparison revealed no significant difference. The eighth hypothesis was thus accepted.

Table 11

Means, Standard Deviations, and *t* scores for the Three Treatment Groups on the Pretest and Posttest Trait Anxiety Scores

	Group					
	PMR		Music		PMR with Music	
	Pre	Post	Pre	Post	Pre	Post
<i>M</i>	41.91	41.91	47.96	43.83	43.26	42.95
<i>SD</i>	9.48	9.86	9.30	9.19	10.72	11.30
<i>t</i>	0**		3.20*		0.24**	

\* Significant at the .05 level.

\*\* Not significant at the .05 level.

**Hypothesis 9:** There will be no significant difference between the pretest and posttest scores of the Trait Anxiety Inventory for the subjects who receive the music listening treatment.

Of the three treatment groups, the music listening group showed the only significant difference between the pretest and posttest means, using the *t* test (Table 11). It should also be noted that the mean pretest score for this group was considerably

higher than the mean pretest score of the other two treatment groups. Since the difference was significant, the ninth hypothesis was rejected.

**Hypothesis 10:** There will be no significant difference between the pretest and posttest scores of the Trait Anxiety Inventory for the subjects who receive the progressive muscle relaxation with music listening treatment.

As can be seen in Table 11, the pretest and posttest means for this group were very similar. Thus, when the *t* test was used to compare the two means, there was no significant difference noted. The tenth hypothesis was therefore accepted.

As with the State Anxiety scores, the three treatment groups were compared to one another using an Analysis of Variance with the posttest Trait Anxiety scores.

**Hypothesis 11:** There will be no significant difference between the posttest Trait Anxiety Inventory scores of the three treatment conditions.

An analysis of variance summary table can be seen in Table 12. The ANOVA revealed that the means of the three treatment groups were not significantly different.

Table 12

Analysis of Variance Summary Table to Compare Posttest Trait Scores

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Between Groups	2	42.17	21.08	.21**
Within Groups	62	6294.08	101.52	

\*\* Not significant at the .05 level.

As a result the eleventh hypothesis was accepted. After reviewing the trait scores in Table 11, it can be noted that the scores are consistently higher than the norms given by Spielberger (1983). Using a normative sample of adolescent males, the norm score for trait anxiety was 40.17 with a standard deviation of 10.53. The mean trait scores for the subjects in this study ranged from 41.91 to 47.96.

## CHAPTER V

### SUMMARY

Over the years, there has been considerable research done to explore the uses of relaxation techniques to reduce anxiety in subjects. Two common techniques, progressive muscle relaxation and music listening, have been the focus of some of this research. Unfortunately, little of this research has been applied to the adolescent population, specifically those with high levels of anxiety, such as those who are adjudicated and in a residential treatment setting. Therefore, the purpose of this study was to determine what effects the progressive muscle relaxation and music listening techniques would have on the anxiety level of adjudicated adolescent males in a residential treatment facility.

The review of literature began with the examination of the progressive muscle relaxation technique. A wide variety of studies revealed that this technique is very effective for anxiety reduction. The literature review then explored the music listening technique, and its effects on both physiological and psychological variables. Results of these studies found that psychological scales achieved more consistent findings than physiological measurements. The review also discovered that music interventions had more effect on state (current) anxiety than on trait (long-term) anxiety.

The discussion then focused on the types of music used in relaxation studies. It was noted that a wide variety of styles and specific musical selections were used in many studies with conflicting results. However, the importance of determining the effects of the music on the subjects before it was used in the study was emphasized.

The review of literature ended with a discussion of studies which combined both the progressive muscle relaxation technique with music listening. It was evident that few research studies have been conducted which explored the effects of combining

both of these techniques

The present study was based on these findings. The intent of this study was to shed light on several aspects of anxiety reduction in adolescents. In addition to determining how each technique, progressive muscle relaxation and music listening, effected the state and trait anxiety of the subjects, this study attempted to determine the effects of combining both of these techniques. It also sought to determine what type of music delinquent adolescent males found to be most beneficial for anxiety reduction, and to determine if there was any correlation between how much the subjects liked the music, and how relaxing they found the music.

The subjects consisted of 65 adjudicated adolescent males, ranging in age from 15-18 years, who resided at the Starr Commonwealth Schools, a residential treatment facility. These subjects were divided into three treatment groups; one which received progressive muscle relaxation, one which received music listening, and one which received progressive muscle relaxation with music listening. The study was implemented in two phases. Phase I included a music selection process where subjects identified a preferred musical style for relaxation. This music was then used in the second phase, which involved the three experimental treatment groups receiving music listening, progressive muscle relaxation, or PMR with music listening.

Anxiety levels were measured for each subject using the State-Trait Anxiety Inventory (STAI) and a Subjective Units of Discomfort (SUD) Scale. The State Anxiety Inventory (Form Y-1) and the SUD Scale were administered on a pretest and posttest basis each session to determine changes in state anxiety as a result of treatment. The Trait Anxiety Inventory (Form Y-2) was administered on a pretest and posttest basis before treatment began and after the last treatment session to determine the effects of overall treatment on trait anxiety.

It was hypothesized that each treatment condition would have no significant effect on the state or trait anxiety of the subjects. It was also hypothesized that there would be no significant difference between the three treatment conditions. In addition it was hypothesized that there would be a positive correlation between the subjects rating

of how much they liked the music and how relaxing they found the music.

The results of this study found that both the progressive muscle relaxation treatment and the music listening treatment were effective in significantly reducing state anxiety in the subjects. However, the progressive muscle relaxation with music listening group failed to show a significant difference in state anxiety scores across all sessions. As for trait anxiety, the progressive muscle relaxation treatment and the PMR with music listening treatment both showed no significant difference between pretest and posttest scores. The music listening treatment, however, had a significant effect on reducing the trait anxiety of the subjects. In addition, a positive correlation was found between the subjects' like and relax ratings of the music used in this study.

### Discussion

It should be noted that the progressive muscle relaxation treatment condition and the music listening treatment condition used in this study were effective in reducing state anxiety in adolescent males. However, when the two techniques were combined, state anxiety levels did not consistently or significantly decrease in every session. In two of the four sessions, the State Anxiety Inventory scores did not significantly decrease for the PMR and music group, and in one of the four sessions, the SUD scores did not significantly decrease. These findings suggest that the PMR with music listening treatment was not as effective in reducing state anxiety as the other two techniques, for the adjudicated adolescent males involved in this study. The subjects may have had some difficulty with the PMR with music listening approach because the music may have distracted their attention away from the PMR dialogue, making it difficult to concentrate on the technique.

In addition, the difference between the pretest and posttest scores of the state anxiety measures (SUD and State Inventory) revealed that the music listening treatment had the greatest effect on reducing state anxiety, although the difference between treatment conditions was not significant. Subjects in the music listening group also

seemed to enjoy the treatment more than the subjects in the other treatment groups. This may be due to the fact that the subjects in the music listening group had only to listen to music that they liked and found relaxing. They were not required to follow specific instructions such as those required in the groups using the progressive muscle relaxation technique. However, it was noticed that the subjects in the music listening group tended to fall asleep more often than the subjects in the other two treatment groups. Perhaps this is due to the fact that they were not listening to spoken dialogue which required some concentration and systematic tensing and relaxing of muscle groups.

The progressive muscle relaxation treatment group in this study showed significant reductions in state anxiety scores across sessions. This supports the idea that the PMR technique could be an effective treatment for anxiety reduction with the delinquent, adolescent, male population.

The data from the PMR with music listening group was not consistent throughout this study, and as stated earlier, there were not significant reductions in state anxiety for some sessions. These findings are contradictory to the research cited earlier in the literature review. Whereas previous studies have found that combining PMR with music listening significantly reduced anxiety (Liebman & MacLaren, 1991; Kibler & Rider, 1983), the results of this study found that combining these two techniques was not the most effective form of treatment for anxiety reduction. In the Liebman and MacLaren (1991) study, the STAI was also used as the dependent variable, although it was only given after treatment occurred. The subjects (pregnant adolescents) were placed in only two treatment groups, receiving either PMR with music or a no treatment control. The PMR with music group was found to show less state anxiety than the control group. Perhaps if some of the subjects in that study had received PMR only or music listening only, the researchers would have found one of those treatments to be even more effective than the PMR with music group.

Kibler and Rider (1983), on the other hand, used three treatment conditions similar to the ones used in this study. However, they used a physiological measure,



finger temperature response, as the dependent variable with college music majors. They found significant differences in finger temperature response in all three treatment groups after treatment. They determined that the groups were not significantly different from one another, similar to the findings in this study.

The findings in this study are also similar to those of Stoudenmire (1975), who found that a PMR treatment or a music listening treatment could significantly reduce state anxiety (using the State Anxiety Inventory) in female undergraduate students. Although, Stoudenmire's findings suggested that the PMR treatment led to greater decreases in anxiety than the music treatment. This study found the opposite to be true. This contradiction may be attributed to the difference in the subjects involved. Stoudenmire employed older, female students who may have been more receptive to the PMR technique than the adolescent males involved in this study. It should be noted that Stoudenmire did not attempt to determine how the subjects responded to the music before it was used in his study.

Based on previous research, it was assumed that the treatments employed in this study would have no significant effect on trait anxiety. This was found to be true for the PMR group and the PMR with music listening group. However, the data from the music listening group revealed a significant difference in trait anxiety scores. This may be due to the fact that the music listening group started out with a much higher level of pretest trait anxiety than the other two groups. When the mean, pretest trait anxiety score from the music group (trait = 47.96) was compared to Spielberger's (1983) norm of adolescent males (trait = 40.17), it was noticed that the mean pretest trait scores for the music group was quite high. On the other hand, posttest trait scores for the music group were more similar to those of the other two treatment groups.

As for the correlation between the subjects rating of how much they liked the music and how relaxing they found the music, the positive correlation that was found was expected. The jazz music selection was the most preferred music for the subjects in this study. This genre of music may have been preferred by the adolescent males because it was the style with which they were most familiar.

### Limitations of the Study

Although studies conducted by Gold (1982) and Longhurst (1987) at the facility established that placement into groups was random, the use of intact cottage groups may at least partially account for differences between the treatments. The groups used in this study may have been different in some ways before the study even began. The use of subjects in these groups was an unavoidable reality due to the nature of Starr Commonwealth's treatment program.

Another limitation to this study was the use of the subjective, psychological dependent measures. Since the STAI and SUD scales are rating scales, they were open to "faking." Subjects may not have accurately reported their anxiety level, but instead may have wanted to please the researcher by giving what they felt was the "correct" response (halo effect). Due to the fact that physiological measurements were not possible in this study because of the amount of subjects receiving treatment at one time, only psychological measures were utilized.

There is also evidence to suggest that tape recorded dialogue of the PMR technique is not as effective as "live" dialogue (Werch, Perkins, & Brown, 1988). However, in order to keep all independent variables as consistent as possible, and to avoid experimenter bias effects, taped dialogue was used in all of the sessions.

### Recommendations for Further Study

Findings from this study suggest that both progressive muscle relaxation and music listening can be effective techniques for anxiety reduction in adjudicated male adolescents. However, results from this study challenge the belief that music listening can be used to enhance the PMR technique. It is recommended that further research using music listening in combination with the PMR technique be done to help determine the true effects of combining these two techniques. In addition, more research should be done in this area with the adolescent population, since little published research is available.

Since music is such an important part of the adolescent subculture, the effects of a wider variety of music on adolescents should be explored. This study focused on musical styles used in previous anxiety reduction research; jazz, new age, and classical. Further research with adolescents should broaden to include more familiar music that is part of their culture, such as rock, rap, and heavy metal. If music listening is explored alone (without the PMR technique) music which has lyrics could be included as part of the study, since a vast majority of music from their culture contains lyrics.

If this study were to be replicated, some minor changes would be encouraged. In the State Anxiety Inventory (Form Y-1), two statements caused confusion for the subjects in almost every treatment group. Number 14, "I feel indecisive," and number 16, "I am content." Subjects were confused as to the definition of the terms, "indecisive" and "content." Therefore, these two statements should be defined prior to taking the Inventory. In addition, the SUD scale that was employed in this study asked the subjects to circle the number which most accurately reflected their current level of relaxation. It is suggested that the SUD form be adapted so that the subjects are required to blacken in the appropriate circle which most accurately reflects their current level of relaxation. In that way, the directions of the two dependent measures, the SUD scale and the State Anxiety Inventory, would be similar, causing less confusion for the subjects.

In order for anxiety reduction techniques to have an influential impact on behaviors associated with anxiety in adjudicated adolescents, it is recommended that future studies involve more intensive treatment conditions. More frequent treatment (several sessions each week) over a longer period of time may not only reduce short-term state anxiety, but could possibly lead to some long-term effects as well. To explore how elevated levels of anxiety contribute to inappropriate behaviors of adjudicated adolescents, the treatment conditions could be applied under certain anxiety-provoking situations, and the effects on certain behaviors could be measured. In this way, the effects of PMR and music listening on behaviors associated with high levels of anxiety could be explored.

One final recommendation would be to have the same subjects experience all three treatment conditions. The same sample of subjects would then provide data for each of the three treatment conditions, and the effects of each treatment condition could be revealed.

## APPENDICES

## **Appendix A**

### **Approval Forms**

THE STARR COMMONWEALTH SCHOOLS

RESEARCH APPROVAL REPORT

Title of Research Proposal:

THE EFFECTS OF MUSIC LISTENING AND PROGRESSIVE RELAXATION  
ON THE ANXIETY LEVEL OF ADOLESCENT MALES.

Investigator:

NED GLADFELTER, RMT-BC

The above mentioned proposal has been reviewed according to the Research Approval Procedure and meets the following criteria:

1. The research is consistent with the program of The Starr Commonwealth Schools and is potentially useful to the organization and beneficial to the children involved.
2. The research presents no risks to the subjects.
3. The research is not disruptive of the ongoing program and will not place unreasonable demands on staff.
4. Participation in the research will be voluntary on the part of the children.
5. The research will obtain approval from responsible parents, guardians or agency representatives.
6. The researcher has agreed to maintain confidentiality of records and other information.
7. The researcher has agreed to share the procedures and results of the research with staff members, parents, or agency representatives.
8. The researcher has agreed to follow the Professional Standards for implementing Research and Evaluation Activities at The Starr Commonwealth Schools.

James W. Margolis  
Program Director

1/6/92

Date

Christine A. Ameson  
Director of Research and Evaluation

1/6/92

Date

Martin S. Mitchell  
Vice President of Program

1/6/92

Date

Human Subjects Institutional Review Board



Kalamazoo, Michigan 49008-3899

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## WESTERN MICHIGAN UNIVERSITY

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**Date:** December 17, 1991

**To:** Ned Gladfelter

**From:** Mary Anne Bunda, Chair *Mary Anne Bunda*

**Re:** HSIRB Project Number 91-12-01

This letter will serve as confirmation that your research protocol, "The effects of music listening and progressive relaxation on the anxiety level of adolescent males" has been approved after expedited review by a subcommittee of the HSIRB. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the approval application.

You must seek reapproval for any change in this design. You must also seek reapproval if the project extends beyond the termination date.

The Board wishes you success in the pursuit of your research goals.

**xc:** Willson, Music Therapy

**Approval Termination:** December 17, 1992



Western Michigan University

**HUMAN SUBJECTS INSTITUTIONAL REVIEW BOARD (HSIRB)  
HUMAN SUBJECTS APPROVAL FORM**

RESEARCH MAY NOT BEGIN UNTIL THE PROTOCOL HAS BEEN REVIEWED, AND APPROVED BY THE HUMAN SUBJECTS INSTITUTIONAL REVIEW BOARD, WHICH MEETS ON A REGULAR MONTHLY BASIS. PROTOCOLS MUST BE RECEIVED BY RESEARCH AND SPONSORED PROGRAMS AT LEAST SEVEN DAYS PRIOR TO A REGULARLY SCHEDULED MEETING IN ORDER TO BE ACTED ON AT THAT MEETING. THE FORM MUST BE TYPEWRITTEN, EXCEPT FOR SIGNATURES.

PRINCIPAL INVESTIGATOR Ned D. Gladfelter, RMT-BC  
DEPARTMENT Music Therapy  
Office Address: 1505 Dalton Center Office Phone: 387-4679  
Home Address: 106 Linden Street, Homer, Michigan 49245  
Home Phone: (616) 781-7445

PROJECT TITLE: The Effects of Music Listening and Progressive Relaxation on the Anxiety Level of Adolescent Males.

PROPOSED PROJECT DATES: From 2/2/91 To 2/26/91

SOURCE OF FUNDING: Self

APPLICATION IS: New X Renewal       

Protocols for projects extending beyond one year from date of HSIRB approval must be submitted annually for renewal.

If this proposal is approved by the Institutional Review Board, the Principal Investigator agrees to notify the HSIRB in advance of any changes in procedures which might be necessitated. If, during the course of the research, unanticipated subject risks are discovered, this will be reported to the IRB immediately.

Ned D. Gladfelter  
PI Signature \_\_\_\_\_ Date \_\_\_\_\_

If the Principal Investigator is a student, complete the following:

Undergraduate Level Research \_\_\_\_\_ Graduate Level Research X

Faculty Advisor Brian Wilson, RMT-BC Telephone 387-4724

Department Music Therapy

\_\_\_\_\_  
Advisor Signature \_\_\_\_\_ Date \_\_\_\_\_

**VULNERABLE SUBJECT INVOLVEMENT (Fill out if applicable)**

Research involves subjects who are:

1. ☒ Children (any subject under the age of 18) Approximate age 16
2. ☐ Mentally Retarded Persons
3. ☐ Mental Health Patients
4. ☐ Prisoners
5. ☐ Pregnant Women
6. ☒ Other subjects whose life circumstances may interfere with their ability to make free choices in consenting to take part in research;  
Behavior Disordered Adolescents in a Residential Treatment Facility for Delinquent Youth.

**LEVEL OF REVIEW**

To determine the appropriate level of review, refer to WMU Policy Guidelines for categories of exempted research (Appendix B).

☐ Exempt (Forward the original application to the Chair of the Department for a cover letter, then forward to HSIRB Chair via RSP)

☒ Subject to Review (Forward original application *plus* 8 copies to HSIRB Chair via RSP)

**BLOOD PRODUCTS INVOLVED**

If your research involves the collection of blood or blood products, then pick up and complete an addendum (HSIRB Collection of Blood and Blood Products Form).

---

**Please Type the Requested Protocol Information On The Following Pages.**

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**ABSTRACT:** Briefly describe the purpose, research design, and site of the proposed research activity.

The purpose of this study is to determine the effects of relaxation techniques on the anxiety level of adolescent males. Music listening and progressive muscle relaxation are two techniques which have been found to reduce anxiety levels in adult subjects. This study attempts to follow up this research by applying it to the adolescent population, and will also determine if there is a difference between treatments involving music listening alone, progressive relaxation alone, or a combination of music listening with progressive relaxation.

The study will involve 72 students residing at the Albion campus of the Starr Commonwealth Schools Residential Treatment Program. There are ten cottages in which groups of twelve adolescent males per cottage reside. Six of these cottage groups will be randomly assigned to one of the treatment conditions: Group 1 - Progressive Muscle Relaxation Alone, Group 2 - Music Listening Alone, or Group 3 - Progressive Muscle Relaxation Combined with Music Listening. There will be two cottage groups assigned to each treatment condition.

Each of the treatment groups will meet once a week, for a 30-minute relaxation session, for a period of four weeks. During each relaxation session, all of the subjects will be pre and post tested with a self-report, Subjective Units of Discomfort (SUD) Scale, and the State-Trait Anxiety Inventory (Spielberger, 1983).

Results between the three treatment groups will be compared to determine which relaxation treatment condition, progressive muscle relaxation, music listening, or a combination of both, is most effective for reducing the anxiety level of adolescent males.

---

**BENEFITS OF RESEARCH:** Briefly describe the expected benefits of research.

Information is needed regarding the effects of relaxation techniques on the anxiety level of adolescent populations, specifically those with behavior disorders. There has been literature to support the use of music listening or progressive relaxation as effective relaxation techniques with adult populations, but little research has been documented using these techniques with adolescents. In addition, research is needed to determine the interactive effects of music on the progressive muscle relaxation technique.

Therefore, this research is needed to help determine which relaxation techniques are most effective in reducing anxiety in adolescent males. This will assist Starr Commonwealth in the development of the best possible techniques in working with adolescents.

---

**CHARACTERISTICS OF SUBJECTS:** Briefly describe the subject population and indicate the source of subjects.

Age: 15-18 years

Sex: Male

These youth have been referred to the residential program of the Albion campus of Starr Commonwealth Schools for delinquent and behavioral problems. These youth are referred from the Michigan Department of Social Services, the Michigan Department of Mental Health, and Michigan County Probate Courts. The average length of stay for these youth is one year.

---

**SUBJECT SELECTION:** How will the subjects be selected? Approximately how many subjects will be involved in the research?

Six cottage groups from the residential population of the Albion campus will be randomly selected to participate in the study. Those students who give their informed consent, and whose parents or guardians give their informed consent will be included in the study.

Of the six cottage groups, two will be randomly assigned to each treatment condition. A total of 72 subjects will be involved in the research.

---

**RISKS TO SUBJECTS:** Briefly describe the nature and likelihood of possible risks (physical, psychological, social) as a result of participation in the research.

There are no expected risks (physical, psychological, or social) involved for the subjects receiving the music listening treatment condition.

The progressive muscle relaxation (PMR) technique, which involves tensing and relaxing muscles, presents minimal physical risks. Occasionally when a subject tenses muscles too tightly, muscle cramps can occur. This can be remedied by modifying the tensing strategy. There are no psychological or social risks for the 48 subjects receiving the PMR (or PMR with music) treatment.

---

**PROTECTION FOR SUBJECTS:** Briefly describe measures taken to protect subjects from possible risks, if any.

All treatment sessions will be conducted by a registered, board-certified music therapist with experience in the music listening and PMR techniques with adolescents. Treatment cottage staff members at the Starr Commonwealth Schools will also be present at each session, and are available to intervene if necessary.

---

**CONFIDENTIALITY OF DATA:** Briefly describe the precautions that will be taken to ensure the privacy of subjects and confidentiality of information. Be explicit if data is sensitive.

The following steps will be taken in order to assure confidentiality:

1. A numerical coding system will be used to identify each subject.
2. Both the coding system and the subjects file will be kept locked in the investigators file cabinet, accessible only to the investigator.
3. All names will be removed upon the receipt of post-test data.

---

**INSTRUMENTATION:** If questionnaires, interview schedules, data collection instruments, other than standardized instrumentation on file with the HSIRB are used, please identify them and attach a copy of what will be used in the project.

The State-Trait Anxiety Inventory (Spielberger, 1983): The State Questionnaire (Form Y-1) will be administered before and after each treatment session. The Trait Questionnaire (Form Y-2) will be administered once at the beginning and then again at the end of the study.

(Continued...)

### **INSTRUMENTATION (Cont.)**

A Subjective Units of Discomfort (SUD) Scale, which requires the subject to evaluate current levels of relaxation on a numerical scale, will also be utilized. (See attached sheet)

---

**INFORMED CONSENT:** Attach a copy of the informed consent and assent (if applicable). Each subject should also be given a copy.

Family Service Workers from the State Commonwealth Schools, who have regular contact with the subjects' parents or guardians, will assist in obtaining the Informed Consent from the subjects' parents or guardians. (See Attached Sheets)

**Appendix B**  
**Informed Consent Procedures**

**Parental/Guardian Consent  
(For Subjects in PMR Treatment)**

**Description and Purpose of Study**

The purpose of this study is to see if relaxation techniques involving progressive muscle relaxation can reduce anxiety in youth. From February 2, 1992, through February 23, 1992, some of the students in the residential program of Starr Commonwealth will have the opportunity to participate in a 4-week relaxation program designed specifically for youth. This program will involve weekly, 30-minute sessions directed by a registered music therapist. The progressive muscle relaxation technique, which involves tensing and relaxing muscles, presents only minimal risks. Occasionally when a student tenses muscles too tightly, muscle cramps can occur. This can be easily remedied by modifying the tensing strategy.

Your child's participation in this study results in no benefits to the Michigan Department of Social Services, Michigan Department of Mental Health, or the Michigan County Probate Courts. We are interested in seeing which relaxation techniques can most effectively help our students feel less anxious and more relaxed. It is hoped that we can use this information to improve our ability to help young people. Results from this study will help us develop the best possible techniques in working with our students.

---

Researcher

**Parental/Guardian Consent  
(For Subjects in Music Listening Treatment)**

**Description and Purpose of Study**

The purpose of this study is to see if relaxation techniques involving listening to music can reduce anxiety in youth. From February 2, 1992, through February 23, 1992, some of the students in the residential program of Starr Commonwealth will have the opportunity to participate in a 4-week relaxation program designed specifically for youth. This program will involve weekly, 30-minute sessions directed by a registered music therapist.

Your child's participation in this study results in no benefits to the Michigan Department of Social Services, Michigan Department of Mental Health, or the Michigan County Probate Courts. We are interested in seeing which relaxation techniques can most effectively help our students feel less anxious and more relaxed. It is hoped that we can use this information to improve our ability to help young people. Results from this study will help us develop the best possible techniques in working with our students.

---

Researcher



**Parental/Guardian Consent  
(For Subjects in PMR and Music Treatment)**

**Description and Purpose of Study**

The purpose of this study is to see if relaxation techniques involving progressive muscle relaxation and listening to music can reduce anxiety in youth. From February 2, 1992, through February 23, 1992, some of the students in the residential program of Starr Commonwealth will have the opportunity to participate in a 4-week relaxation program designed specifically for youth. This program will involve weekly, 30-minute sessions directed by a registered music therapist. The progressive muscle relaxation technique, which involves tensing and relaxing muscles, presents only minimal risks. Occasionally when a student tenses muscles too tightly, muscle cramps can occur. This can be easily remedied by modifying the tensing strategy.

Your child's participation in this study results in no benefits to the Michigan Department of Social Services, Michigan Department of Mental Health, or the Michigan County Probate Courts. We are interested in seeing which relaxation techniques can most effectively help our students feel less anxious and more relaxed. It is hoped that we can use this information to improve our ability to help young people. Results from this study will help us develop the best possible techniques in working with our students.

---

Researcher

Parental/Guardian Informed Consent Form

**Consent For Participation In Research**

I consent to my child's participation in a study which intends to investigate the effects of exposure to relaxation techniques on anxiety. I have read the *Description and Purpose of the Study* and have read about the possible benefits/ risks of this study as well.

I acknowledge that I have had the opportunity to obtain additional information regarding the study and that any questions I have raised have been answered to my full satisfaction. Before my child can be considered for involvement in this study, I realize that I must give my permission by signing this form. Upon doing so, I understand that I am (my child is) free to withdraw consent at any time, and to discontinue participation in the study without prejudice to me (or my child). The information obtained from my child will remain confidential.

Finally, I acknowledge that I have read and fully understand the consent form. I have signed it freely and voluntarily and understand a copy is available upon request.

\_\_\_\_\_  
Date

\_\_\_\_\_  
Parent/Guardian

**Researcher**

Ned D. Gladfelter, RMT-BC  
The Starr Commonwealth Schools  
#(517) 629-5591

**Faculty Advisor**

Brian Wilson, RMT-BC  
Western Michigan University  
#(616) 387-4679

**Subject Informed Consent Form  
(Progressive Muscle Relaxation Treatment)**

**Subject  
Informed Consent Form**

**Purpose**

The purpose of this study is to explore various methods of promoting relaxation and anxiety reduction.

**Confidentiality of Data**

The following steps will be taken in order to assure confidentiality:

1. A numerical coding system will be used to identify each subject.
2. Both the coding system and the subjects file will be kept locked in the investigators file cabinet accessible only to the investigator.
3. All names will be removed upon receipt of post-test data.

**Benefits/Risks**

**Benefits:** The benefits of participation in this study include training in relaxation techniques which have been found to be effective in reducing anxiety.

**Risks:** Subjects will participate in the progressive muscle relaxation technique, which presents minimal risks. This technique involves tensing and relaxing muscles. Occasionally when a subject tenses muscles too tightly, muscle cramps can occur. This can be remedied by modifying the tensing strategy.

**Subject Participation**

Subjects will be participating in 4 weeks of sessions in which progressive muscle relaxation is used to promote relaxation. There will be one session per week, each lasting 30 minutes. Subjects may choose to discontinue participation in the study at any time without penalty.

I understand that I am being asked to participate as a subject in the graduate research as it has been described above. I understand that in the event of injury resulting from this research, financial compensation is not available, but emergency medical treatment will be provided to me by the Starr Commonwealth Schools Residential Treatment Program at no cost to me or my family. My participation in this study results in no benefits to the Michigan Department of Social Services, Michigan Department of Mental Health, or the Michigan County Probate Courts. If I have any further questions, I can contact Ned Gladfelter at extension #340 or Brian Wilson, Faculty Advisor at Western Michigan University, at (616)387-4679. I have read and understand the information above and I agree to participate in this study.

\_\_\_\_\_  
Participant                      Date

\_\_\_\_\_  
Witness                      Date

**Subject Informed Consent Form  
(Music Treatment)**

**Subject  
Informed Consent Form**

**Purpose**

The purpose of this study is to explore various methods of promoting relaxation and anxiety reduction.

**Confidentiality of Data**

The following steps will be taken in order to assure confidentiality:

1. A numerical coding system will be used to identify each subject.
2. Both the coding system and the subjects file will be kept locked in the investigators file cabinet accessible only to the investigator.
3. All names will be removed upon receipt of post-test data.

**Benefits/Risks**

Benefits: The benefits of participation in this study include training in relaxation techniques which have been found to be effective in reducing anxiety.

Risks: There are no expected risks.

**Subject Participation**

Subjects will be participating in 4 weeks of sessions in which music is used to promote relaxation. There will be one session per week, each lasting 30 minutes. Subjects may choose to discontinue participation in the study at any time without penalty.

I understand that I am being asked to participate as a subject in the graduate research as it has been described above. I understand that in the event of injury resulting from this research, financial compensation is not available, but emergency medical treatment will be provided to me by the Starr Commonwealth Schools Residential Treatment Program at no cost to me or my family. My participation in this study results in no benefits to the Michigan Department of Social Services, Michigan Department of Mental Health, or the Michigan County Probate Courts. If I have any further questions, I can contact Ned Gladfelter at extension #340 or Brian Wilson, Faculty Advisor at Western Michigan University, at (616)387-4679. I have read and understand the information above and I agree to participate in this study.

\_\_\_\_\_  
Participant                      Date

\_\_\_\_\_  
Witness                              Date

**Subject Informed Consent Form  
(PMR and Music Treatment)**

**Subject  
Informed Consent Form**

**Purpose**

The purpose of this study is to explore various methods of promoting relaxation and anxiety reduction.

**Confidentiality of Data**

The following steps will be taken in order to assure confidentiality:

1. A numerical coding system will be used to identify each subject.
2. Both the coding system and the subjects file will be kept locked in the investigators file cabinet accessible only to the investigator.
3. All names will be removed upon receipt of post-test data.

**Benefits/Risks**

**Benefits:** The benefits of participation in this study include training in relaxation techniques which have been found to be effective in reducing anxiety.

**Risks:** Subjects will participate in the progressive muscle relaxation technique, which presents minimal risks. This technique involves tensing and relaxing muscles. Occasionally when a subject tenses muscles too tightly, muscle cramps can occur. This can be remedied by modifying the tensing strategy.

**Subject Participation**

Subjects will be participating in 4 weeks of sessions in which music listening and progressive relaxation is used to promote relaxation. There will be one session per week, each lasting 30 minutes. Subjects may choose to discontinue participation in the study at any time without penalty.

I understand that I am being asked to participate as a subject in the graduate research as it has been described above. I understand that in the event of injury resulting from this research, financial compensation is not available, but emergency medical treatment will be provided to me by the Starr Commonwealth Schools Residential Treatment Program at no cost to me or my family. My participation in this study results in no benefits to the Michigan Department of Social Services, Michigan Department of Mental Health, or the Michigan County Probate Courts. If I have any further questions, I can contact Ned Gladfelter at extension #340 or Brian Wilson, Faculty Advisor at Western Michigan University, at (616)387-4679. I have read and understand the information above and I agree to participate in this study.

\_\_\_\_\_  
Participant

\_\_\_\_\_  
Date

\_\_\_\_\_  
Witness

\_\_\_\_\_  
Date

**Appendix C**  
**Taped Dialogue for Treatment Conditions**

## Taped Dialogue of PMR Technique

Welcome to the relaxation session...

Some brief reminders before we begin the relaxation session:

- (1) Don't create tension in a muscle group until I say **now**. Then release the tension that you build up in each muscle group immediately upon my cue (now relax). Let all the tension go at the same time.
- (2) Once we've relaxed a muscle group, try not to move that group of muscles. However, I want you to be comfortable at all times, so don't be afraid to make small, unnecessary movements during the session.
- (3) Please do not talk during the session. Don't disturb other group members' relaxing experience. If you have an emergency and need something, raise your hand and Mr. Gladfelter will assist you.

We will now begin...

You may close your eyes if you wish. (Music will begin here for the group receiving PMR with Music)

### RELAXATION SESSION

1. OK, I want you to make a tight fist with your right hand and lower arm now...tight, hard, hold it, notice what it feels like to have tension, feel the muscle pull...now relax...let it all go, completely relax. Focus on the feeling of relaxation in the hand and lower arm. Notice the difference between the state of tension and relaxation and go on relaxing...

And once again, make a tight fist with your right hand now...pull it tight, hard, notice the tension...now relax...all at once, letting the hand be completely and totally relaxed. Go on relaxing...Let the muscles get more relaxed...

2. Now I'm going to ask you to shift your attention and focus on the muscles of your right, upper arm (your right biceps). OK, as we practiced, tense the muscles by pulling them in to your side now...tight, hard, pull them, notice the feeling of tension...now relax...let them go, go on relaxing...just keep relaxing...

Once again, I want you to focus all of your attention on your right biceps and tense them now...tight, hard, pull, focus all of your attention...now relax...let your muscles become more completely relaxed than ever before. Go on relaxing...experiencing complete relaxation in those muscles...enjoy the feelings of relaxation...

3. Now I'd like you to focus your attention on the muscles in your left hand and lower, left arm. I want you to tense them by making a tight fist now...now relax...

Once again, focus all of your attention on your left hand and lower arm and tense the muscles now...now relax...

4. Let's move up your left arm and tense the upper portion of your left arm by pushing it into your side while pulling down now...now relax...

Just as before, I want you to tense the muscle in your upper left arm now...now relax...both arms and hand are totally relaxed...enjoy this feeling...

5. Now I'm going to ask you to shift your attention and focus on the muscles of your forehead. Tense them by lifting your eyebrows now...now relax...Once again...
6. Central part of the face...tense by squinting eyes, wrinkling up nose...Once again...
7. Lower part of the face...tense by clenching teeth and pulling back corners of mouth into a tight smile...Just as before...

8. Moving down your body, focus all of your attention on your neck muscles. To tense these, you pull your head forward to touch your chin with your chest while pushing your neck back. I want you to tense your neck muscles now...now relax...Once again...

9. And now, I'm going to ask you to shift your attention to the muscles of your chest, shoulders, and back. And just as we described earlier, I want you to take a deep breath and pull the shoulders back and together now...now relax...Once again...

Be totally inactive...just go on relaxing...noticing your slow and regular breathing...visualizing how these muscles are loosening up, unwinding, and relaxing even more...continue to relax...enjoying the complete feeling of relaxation...

10. And now I want you to direct your focus of attention to the muscles of the stomach and abdomen. Make your stomach muscles hard and tense now...now relax...Focusing on your stomach again...
11. OK, now we are going to move down to our legs. Remember to take a deep breath each time you tense the muscles in your legs. I want you to focus your attention on your upper right leg. Take a deep breath and cause tension by lifting your right leg slightly off the ground now...hold the breath, feel the tension in the leg...now relax...Let that breath go, and as it goes, all the tension in the upper right leg can go with it...Once again...
12. Lower right leg...pull toes upward...feel tension in calf and lower leg...Once again...
13. Right foot...curl toes down and bend foot slightly in...Just as before...
14. Upper left leg...lift it slightly...Once again...
15. Lower left leg...pull toes upward...Once again...
16. Left foot...curl toes down and bend foot slightly in...Just as before...

Just allow these muscles to go on relaxing completely...



We've relaxed the muscles in your hands and arms...notice the relaxation level and allow these muscles to go on relaxing...

We've relaxed the muscles in your face and neck...allow these muscles to continue relaxing...

We've relaxed the muscles of your back, shoulders, and chest...allow these to be completely relaxed...

We've relaxed the muscles of your stomach...allow these muscles to be completely and totally relaxed...

Enjoy the feeling of relaxation in your legs and feet...focus on the pleasant feelings of deep relaxation...breathe in and out...evenly and comfortably...and just go right on relaxing...

(Enjoyment period...pause for several minutes. For the PMR and Music group, the music will fade out at the end of the enjoyment period)

(To terminate the relaxation session:)

In a few minutes, I'm going to count backwards from four to one...

On the count of four, I'd like you to move your legs and feet around a little...

On the count of three, I'd like you to move your arms and hands...

On the count of two, I'd like you to move your head and neck...

On the count of one, open your eyes, feeling very comfortable, calm, relaxed, as if you had a brief and very pleasant nap...

OK, four...move your legs and feet

three...arms and hands

two...head and neck

one...open your eyes. (End of dialogue)

### **Taped Dialogue for Music Listening Treatment**

**Welcome to the relaxation session...**

**A brief reminder before we begin the relaxation session:**

- (1) Please do not talk during the session. Don't disturb other group members' relaxing experience. If you have an emergency and need something, raise your hand and Mr. Gladfelter will assist you.**

**You may now get comfortable on your mat...close your eyes...take a few deep breaths...get in touch with the tension level in your body...just listen to the music, and allow yourself to relax...**

**(The music will begin here and will last for 20 minutes - the same length of time the PMR dialogue lasts)**

**Appendix D**  
**SUD Scale**

## SUD Scale

Name: \_\_\_\_\_

Cottage: \_\_\_\_\_

Date: \_\_\_\_\_

**Pre-Relaxation Session**

Circle the number which most accurately reflects your current level of relaxation

Very relaxed

Neither Tense  
nor relaxed

Very Tense

1      2      3      4      5      6      7      8      9      10

Name: \_\_\_\_\_

Cottage: \_\_\_\_\_

Date: \_\_\_\_\_

**Post-Relaxation Session**

Circle the number which most accurately reflects your current level of relaxation

Very relaxed

Neither Tense  
nor relaxed

Very Tense

1      2      3      4      5      6      7      8      9      10

**Appendix E**  
**Phase I: Music Selection Process**

## Music Selection Process

### **“Dialogue” to Determine What Music to Use in the Music Listening Treatment Condition**

In the near future, you will be invited to participate in a study which involves music listening as a means of relaxation. The purpose of this session is to determine what type of music adolescent males, such as yourselves, think is relaxing. The results from this session will help to determine the best possible music to use in the study.

#### *Distribute Music Preference for Relaxation Forms*

Here is a copy of the form which will be used this session. Notice the instructions; You will listen to three samples of music. After listening to each sample, you will be asked to circle the number that best represents your reaction to the music.

The music selections you will be hearing are samples of music which have been found to be “relaxing” in other studies involving music listening. Notice on your form, that for each sample of music there are two statements which you are asked to respond to. The first statement focuses on how much you *like* the sample of music. That is, how much you enjoy listening to the music. Please circle only one of the numbers. Do not put any circles halfway between the numbers to represent numbers such as 2.5. The second statement focuses on how *relaxing* you find the sample of music. That is, how much the music seems to allow you to calm down, mellow out, and slow down your heart rate. Once again, please circle only one number. Keep in mind that in addition to liking a sample of music and finding it relaxing, that you can like the sample of music a lot, but you may not think that it is relaxing. Or you may think it is very relaxing, but dislike it very much.

Does everyone understand how to complete the form?

*Distribute pencils and clipboards so forms can be completed with ease*

If there are no more questions, I would like each of you to now move to one of the stations in the room.

*There will be one station for each group member, consisting of a padded mat and a pillow. Once they have arrived at their stations...*

From this point on, there should be no interaction (no talking, or gesturing) with any of the other group members until after this session. We will now begin...

I would like you to lie on your back and close your eyes. Take a few deep breaths, get in touch with the tension level in your body, and listen to the first sample of music...

*Sample #1 will be played here*

Now I would like you to sit up and circle the number for each of the statements that best represents your reaction to the music you just heard. When you are finished, turn your sheet over for Sample # 2.

Once again, I would like you to lie on your back and close your eyes. Take a few deep breaths, get in touch with the tension level in your body, and listen to the second sample of music...

*Sample #2 will be played here*

Now I would like you to sit up and circle the number for each of the statements that best represents your reaction to the music you just heard.

Once again, I would like you to lie on your back and close your eyes. Take a few deep breaths, get in touch with the tension level in your body, and listen to the third sample of music...

*Sample #3 will be played here*

Now I would like you to sit up and circle the number for each of the statements that best represents your reaction to the music you just heard. If you have any further comments you would like to make, please write them in the space provided on your form.

When you have completed your form, please return from your station and rejoin as a group to be dismissed.

## Forms to Collect Data to Determine Preferred Music

Name: \_\_\_\_\_

Cottage: \_\_\_\_\_

**Music Preference For Relaxation**

You will listen to three samples of music. After listening to each sample, you will be asked to put a circle around the number that best represents your reaction to the music.

**Sample 1:** Circle the number that best represents how much you *like* this sample of music:

I like it a lot

No reaction

I dislike it very much

1

2

3

4

5

Circle the number that best represents how *relaxing* you find this sample of music:

It is very relaxing

No reaction

It is definitely not relaxing

1

2

3

4

5



**Sample 2:** Circle the number that best represents how much you *like* this sample of music:

I like it a lot

No reaction

I dislike it very much

1

2

3

4

5

Circle the number that best represents how *relaxing* you find this sample of music:

It is very relaxing

No reaction

It is definitely not relaxing

1

2

3

4

5

**Sample 3:** Circle the number that best represents how much you *like* this sample of music:

I like it a lot

No reaction

I dislike it very much

1

2

3

4

5

Circle the number that best represents how *relaxing* you find this sample of music:

It is very relaxing

No reaction

It is definitely not relaxing

1

2

3

4

5

**Comments:**

**Appendix F**  
**Dialogue to Explain the PMR Procedure in the First Treatment Session**

## Dialogue to Explain the PMR Procedure in the First Treatment Session

The procedure we will be using is known as **progressive muscle relaxation training**. It basically consists of learning to tense and then relax various muscle groups throughout the body, while at the same time paying close attention to the feelings associated with both tension and relaxation.

You may be wondering why we start off producing tension if we want to produce relaxation. The reason is that everyone is always at some level of tension during their waking hours. If a person were not tense to some extent, he would fall down. The goal of relaxation training is to help you learn to reduce muscle tension in your body any time you wish to do so.

For example, I'm going to ask you to focus your attention on the muscles in your right hand and lower arm. To cause tension, I want you to make a tight fist. Become aware of what the tension really feels like. Now relax a minute. Notice the vivid contrast between tension and relaxation. Compare the two and appreciate the difference in feeling associated with each of these states. You will become aware of what tension really feels like in each of the different muscle groups we will be dealing with today.

Any question so far?

We will now become familiar with how to tense and relax the muscle groups that will be addressed in these relaxation sessions.

### 1. We will begin with the right hand and forearm...

You will be asked to tense these muscles by making a tight fist. Feel the tension in the hand, over the knuckles, and up into the lower arm. Can you feel the tension? OK, fine.

### 2. After we've relaxed that group of muscles, we will then move to the muscles of the upper right arm. To cause tension, push your elbow into your side while pulling down. An alternate way to tense this muscle is to push your elbow into the mat, by your side.

### 3. Left hand...make a fist.

### 4. Left upper arm...same as right.

### 5. Upper part of face (forehead)...Raise eyebrows.

### 6. Central part of face...squint eyes and wrinkle up nose.

### 7. Lower part of face...clench teeth and pull back corners of mouth into a tight smile.

That takes care of the face...Next we'll move to the neck.

### 8. Neck...pull head forward to touch your chin to your chest while pushing your neck back so you can counterpose the action (lift your head up off pillow).

### 9. Chest, Shoulders, and Back...the best way to cause tension is by taking a deep breath and pulling the shoulders back and together so shoulder blades are almost touching.

10. Stomach or abdomen...tense stomach muscles to make them feel hard...put hand there to check tenseness.
11. Upper right leg...lift leg slightly off ground.
12. Lower right leg...pull toes upward toward body...feel tension in calf and lower leg.
13. Right foot...curl toes down and bend foot slightly in.
14. Upper left leg...Same as right leg
15. Lower left leg...Same as right leg
16. Left foot...Same as right foot

Does anyone have questions about what we will be doing?

(The subjects should be able to produce tension in each of the muscle groups)

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