THE EFFECTS OF VERBAL SUGGESTION WITH MUSIC TO REDUCE STATE ANXIETY LEVELS IN FEMALE COLLEGE STUDENTS

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ABSTRACT

The purpose of this study was to determine the effects of a statement of suggestion with music on state anxiety levels of 30 female college students who were not music majors. Subjects were randomly assigned to either of two groups: (a) New Age music only and (b) New Age music plus a statement of suggestion taken verbatim from the marketing jacket of the tape. All subjects listened to identical 20-minute excerpts of New Age music. Pre-and post-tests were given in the form of STAI-Form Y-1 and Electrodermal responses. Electrodermal measurements were taken for 3 minutes prior to and after 15 minutes of music listening. Results indicated no significant differences between groups on either variable.

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CHAPTER I

Introduction

From the earliest times, philosophers espoused a connection between one's thoughts and one's reality. With the advent of 19th century scientific thought, anything "unproven" disappeared from the active body of knowledge. In this century, researchers have returned to explore this concept of mind and body. This time they come armed with scientific methods and new instrumentation to document their findings.

Two examples of scientific research in the field are reported in the 1950's. Wolf (1950) reported that his subject overcame the medically indicated effects of the drug, Ipecac, by believing a second dose would alleviate the vomiting syndrome. Similarly, Volgyesi (1954), reported that 70% of the subjects injected with distilled water while being told by medical personnel that it was a highly effective cure for peptic ulcers actually showed complete remission of their ulcers. Findings from both these studies substantiate the mind/body connection and the power of verbal suggestion to alter an individual's perception. Whether the verbal suggestion is, in fact, true or false does not appear to hinder the psychological acceptance of the idea. Furthermore, if the suggested perception is internalized as

a belief, physiological changes consistent with this mind set may result.

Stress is a major concern to members of the health care community and the population in general. Toffler (1970) states that, if not controlled, stress and its related mental and physical ills, may become one of humanity's greatest plagues.

Recent statistics (American Psychological Association, 1985) imply that women represent the most stressed segment of contemporary society. Women today are expected to maintain traditional mothering roles while also assuming new roles such as provider, business executive, and/or student. Phelps and Austin (1987) coined the term, "superwoman syndrome," to describe the suffering of modern women who try to juggle the multiple roles demanded of them.

Another segment of society suffering greatly from "super stress" is the university student. Deffenbacher and McKinley (1983) state that at one time or another, all students experience stress of an affective, cognitive, or behavorial nature. According to their research, the negative effects of student stress are capable of interfering not only with academic achievement but also with physical and mental health, vocational development, and personal adjustment. CBS News (1989) signaled greater alarm for student stress. Present lack of enough financial funding, social pressures, and the

need for immediate career decisions for first year college students are raising indicators of stress (i.e., smoking, drugs, drinking) by as much as 10%. Additional statistics suggest a change in the population mix of university students. In 1977, 36% of all university students nationwide were "non traditional" (Barr, Galassi, & Kaplan, 1983). Such students may be (a) females returning to school after having had children, or (b) divorced women with children, seeking education to further their careers and to achieve financial security. These women fulfill multiple roles and carry the stresses from each of them.

Music has been employed for healing the mind and body since the beginning of recorded history. Literary allusions abound suggesting that music has the capability to cure the maladies of the mind, body, and spirit. In the Old Testament, David is said to have cured King Saul's madness by playing his seven stringed "magic lyre." Licht (1946) cited Marianus Capella (an ancient music author) as having said: "I have often cured disorders of the mind as well as the body with music" (p.6). Additionally, Licht (1946) reported that Celsus (an early and revered medical authority) is said to have written of the mentally ill: "We must quiet their demoniacal laughter...and soothe their sadness by harmony, the sound of cymbals and other noisy instruments" (p. 8). The early Greeks claimed music cured depression, disordered minds,

epilepsy, and gout. Plato and Aristotle designated certain musical modes as beneficial to proper behaviors in society. The Egyptian High Priests and Priestesses, schooled in both music and medicine, employed music as an integral part of their religious, mystical healing ceremonies. In the 15th century, medicine men and others with great learning prescribed music for various forms of mental and physical ills (Helene, 1943). Even an old adage claimed that music had a special power "to soothe the savage breast."

Today, the use of music for wholistic healing is having a recognizable rebirth. The literatures of psychology, medicine, and music therapy abound with experimental uses of music for healing the mind and the body. Of particular interest to this study is the research focusing on reduction of stress and anxiety with a variety of subject populations (Hanser, 1985). Music is being coupled with guided imagery as standard procedure for relaxation and desensitization (Bonny & Savary, 1973; Kibler & Rider, 1983; Rider, Floyd & Kirkpatrick, 1985). It is being used to reduce pain heightened by the anxiety of childbirth (Clark, McCorkle, & Williams, 1981; Hanser, Larson, & O'Connell, 1983); in burn units (Christenberry, 1979; McDonnell, 1984); in palliative care (Munro, 1984), and as an adjunct to anesthesia (Light, Love, Benson, & Morch, 1954; Taylor, 1981). Not only are psychologists and music therapists researching the mental

and physical effects of music and pure tones, but research interest is also high among musicians and composers. Psychologists, physicists, musicians, and other health care professionals and scientists are joining forces to produce what is being marketed as New Age music. Such music may be defined as a tonal composition created specifically according to the laws of physics and sound to guarantee a decrease in the anxiety state of an individual (Halpern, 1989).

In a recent article, Halpern (1989) claims that his "scientifically composed, orchestrated, and taped music" is more capable of evoking a wholistic relaxation response than any previously known period music. He claims to have tested his version of New Age music in a series of studies. Results (using Kirlian photographs, Galvanic Skin Response, and Electroencephalogram (EEG) as dependent variables) showed that his music elicited statistically greater relaxation response from subjects than did selections of classical music.

Purpose of the Study

The purpose of this study was to compare the effects of music listening upon levels of anxiety with and without an initiating statement of expectation. The statement of expectation claimed that the music had been composed for the purpose of reducing listener anxiety levels and that well-designed and documented scientific research supported this result. Measurement of tension levels was achieved

through electrodermal response and a self-report questionnaire.

Need For Study

Almost daily one hears or sees some reference to stress. More and more evidence supports negative (excess) stress as a cause or component of practically every disease. While the cost of traditional medical care continues to rise at an alarming rate, equally alarming is the growing list of dangerous side effects of the various prescription drugs. Today it behooves an individual to seek and to use new, safe, moderately priced methods of health maintenance. Female college students, continuously stressed from multiple forces, are perhaps more in need of such methods than most. It is conjectured that verbal suggestion, coupled with music marketed as "relaxing," might serve as an effective, non-pharmaceutical aid to stress reduction. This bi-faceted tool for relaxation may offer promise as a unique contribution from the field of music therapy to reduce stress in a safe, painless, affordable way.

Definitions

The words anxiety and suggestion have many interpretations. For the purpose of this study, the following definitions will be used.

Suggestion is defined as "the psychological process by which as idea is induced in or adopted without argument,

command, or coercion" (The American Heritage Dictionary, 1985, p. 1216).

Spielberger, Gorsuch, Lushene, Vagg, and Jacobs, (1983) define anxiety as a two-part construct. State anxiety is that feeling of nervousness, apprehension, or worry that one experiences here and now--or at any one moment. In contrast, trait anxiety is a relatively stable and predictable pattern of reactive behavior characteristic of an individual over a long period of time.

CHAPTER II

Review of Literature

This review of literature will address research from two major areas of inquiry. These areas are: (a) the use of music as an alleviant to anxiety and (b) the mind/body interaction as it relates to the power of suggestion to alter an individual's psychological and physiological response.

Music As An Alleviant to Anxiety

Music of and by itself has the power to effect change upon mind and body (Gaston, 1968). Although the essence of this "power" has not yet been isolated into the "science of sound healing", that music can produce "affective" human response has been well documented (Lundin, 1967). Historically, several theorists have offered a similar vibrational theory to explain generalized musical "cures". Licht (1946) cites Coelius Aurelius, a revered music writer of ancient Rome, as having stated that individuals could be relieved of pain "by causing vibration in the fibres of the affected part" (p. 7). Helene (1943) reports that a 15th century physician named Paracelsus is said to have practiced a "music medicine:" "Special compositions were prescribed for certain maladies in accordance with the vibratory law..." (p. 19). Taylor (1981) reports that, in 1919, a British nurse

and musician claimed: "Tests have been made upon healthy men, and it has been ascertained that certain pitches or harmonic combinations have a certain bodily effect" (p. 7). Today, Halpern (1978), a pioneer of New Age music, states that the human body is like a musical instrument. He claims that by applying proper frequencies to appropriate organs and sites of resonance in the physical and mental bodies, one can "tune" the body to homeostasis.

Three additional theorists focus solely upon the curative power of music to alleviate stress. Kroeger (1977) states that music may create a hypnotic effect or may redirect an individual's attention away from the source of stress. Goldstein (1980) asserts that music triggers release of natural opiates causing distinct biochemical alterations. Siegel (1986) contends that music opens "spiritual windows" similar to what one would experience in a ritualistic, religious healing ceremony.

Although many theories attempt to explain how music reduces stress, no single theory has yet been accepted as the sole and complete "truth." This review of literature will not debate the truth of any of these theories but will focus instead upon presenting documentation of the effects of music as a stress alleviant with various populations in multiple settings.

Hospitals are scenes of much stress and anxiety. Many

researchers have tested the effects of music in this setting. Working with infants and toddlers, Marley (1984) found that 15 to 60 minute music sessions using songs, games, and movement reduced stressful behaviors and promoted relaxation. McDonnell (1984) found that music could be successfully employed to relieve separation anxiety for children in trauma units and to provide a focal point of shared pleasure for all members of the family. Christenberry (1979) reported that music relieved the stress of constant pain and boredom of hospital routine for young burn patients. Fagan (1982), Bailey (1984), and Munro (1984), working with terminally ill patients, found music effective in reducing the fear of and anxiety about death. Bonny (1983) reported successfully using "sedative" music to relieve "intensive care unit syndrome" of which anxiety is a part. Clark, McCorkle, and Williams (1981) and Hanser, Larson, and O'Connell (1983) found positive association with the use of music to reduce anxiety attendant to childbirth. These researchers have found unanimous success in the use of music to reduce the situational stress attendant to the hospital setting.

In a non-medical setting, several researchers studied the effects of pre-categorized music upon some form of state anxiety, such as performance or test anxiety. Pre-categorization of music was often determined by the researcher. Classifications were frequently designated as

stimulative, sedative, happy, or sad. Many studies were based upon the comparison of how subjects' anxiety levels reacted to one type of music as opposed to the other. For example, Biller, Olson, and Breen (1974) investigated the effects of happy or sad music with 60 introductory psychology students. Results showed that listening to sad music without active participation with the music produced significantly less state anxiety than any of the other five test groups.

Studying test anxiety, Fisher and Greenburg (1972) reported that calming music produced the least anxiety in the 90 female university subjects taking a battery of psychological tests. Additionally, Stanton (1973) found that while a background of slow classical music produced significant reduction of test anxiety in highly anxious college students, music played as a prelude to test taking was even more effective in reducing stress for this population (1975). When studying performance anxiety, Smith and Morris (1976) compared the effects of stimulative and sedative music upon anxiety levels of 66 introductory psychology students taking an exam worth more than half of the semester grade. Results showed that sedative music (as well as no music) reduced emotionality during progressive testing. In research where subjects pre-categorized music as exciting or calming, Rohner and Miller (1980) found that 321 student subjects experienced less anxiety while listening to calming rather

than exciting music. Although this literature supports reduction of state anxiety through use of music categorized as "sedative" or calming, the dependent measure for all the aforementioned studies has been some form of self report. Hanser (1985) states that self report does not always concur with physiological measurement of anxiety (Jellison, 1976). Several researchers have tested subjects' state anxiety levels using various kinds of physiological measurements. Employing GSR as the dependent measure, Michel (1952) found that sedative music created fewer GSR deflections than did stimulative music in his seventh grade subject population. Landreth and Landreth (1974), in a six week study with 22 college subjects, reported that sedative, as opposed to stimulative music, tended to decrease both heart and pulse rates.

So far, this review has cited research wherein music termed as sedative (calming) has been compared to music termed as stimulating (exciting). Reduction of test or performance anxiety as measured by either self report or various physiological measures has been established through use of sedative music. The remaining review of literature will report findings about music termed "New Age," which, by Gaston's (1968) descriptions for stimulative and sedative music, would most likely fall into the classification of sedative.

According to Halpern and Savory (1985), New Age music is not just "calming" music. It is music composed according to the principles of psychoacoustics for the purpose of creating harmony and relaxation of mind, body, and spirit. Its structure might best be defined as a formless undulation of sound colors in a consistent pace. Isacoff (1989) reports that Liz Story, a New Age pianist and composer, defines it as music which lacks the traditional tension building and releasing mechanisms of harmony and melody. Instead it creates an atmosphere of artifice which allows the listener to feel and experience her/his innermost being with total freedom of expression. Although little research has been conducted with this contemporary form of music, the following studies were presently available in the literature: Logan and Roberts (1984) tested music marketed as capable of creating a relaxation response in listeners. Using a self-report tension scale to compare the effects of music and no-music conditions, results showed that the lowest tension readings were assessed during a no-music condition. In contrast to this result, Halpern (1989) claims that extensive testing of his New Age compositions has demonstrated significant evidence of subject stress reduction both through self report and physiological measurement of anxiety. He reports comparing classical music with his New Age compositions in a double-blind study using GSR, EEG, and

Kirlian photographs as dependent measures. Results indicated that Halpern's music produced: (a) significantly greater levels of relaxation than did classical music, (b) more alpha waves than did classical music and (c) more change, more rapidly, in subject's "electromagnetic fields" than did classical music.

More and more New Age music is being recorded and marketed with a claim that the music has been scientifically composed to create relaxation within the listener. As with the taped music used for this research, there is often an additional claim that this music has been subject tested and thereby "scientifically proven" effective. Although there is substantial literature to support calming music as an aid to relaxation, there is yet little to support this new form specifically as a superior aid to relaxation.

The remaining sections of this review of literature will address the second major area of inquiry relevant to the present research. A brief historical overview of the mind/body interaction introduces the subject of the power of suggestion as a way to alter an individual's psychological and physiological responses.

Mind/Body Interaction

Villoldo and Krippner (1987) state that for over 100,000 years, primitive societies accepted the fact that certain individuals possess superior abilities to heal themselves and

others. Such individuals were called "shamans" and were acknowledged by community members to be in touch with some force that exerted healing power over mind, body, and soul. These "wise ones" treated their clients on all levels of being; mind, body, and soul were treated as a unit. The healer had the intuitive power to discern which aspect of being was the actual precipitant of the disease and which aspect was merely its manifestation. Human beings were not seen as divided, but as integrated. Until the Middle Ages, "men of letters" held the same conviction as these shamans. Physicians, such as Paracelsus, were trained in chemistry, biology, philosophy, and what we know today as psychology (Helene, 1943). They acknowledged the relationship of mind and body along with an individual's interconnection with and reaction to her/his environment (both here and beyond). At the time of the Middle Ages, however, the pendulum began to swing from a concept of "wholeness" to one of "separateness" (Pelletier, 1977). Mind, body, and spirit came to be viewed as independent entities, each functioning without aid or need of the other. The body was assigned for treatment to "bleeders" or "bile examiners", who were the medical experts of the time. The mind was treated through use of the occult traditions of alchemy or magic. The spirit was left to the care of current orthodox religions.

For our Western Civilizations, this Middle Age

philosophical blueprint regarding human nature became the mold from which our present day medical system was fashioned. Generally, modern Western physicians are assigned to deal with the ills of the body; psychiatrists and psychologists are delegated to treat the ills of the mind; and, members of the clergy are expected to care for spiritual health. But such separatism, with all its exacting scientific focus and specialization, has still left many questions unanswered. The cause and cure of human illness remains an unsolved mystery, and the controversy of "what causes what" rages on.

To answer this unsolved mystery, two opposing schools of thought have developed. On one side of the controversy, some health professionals hold that physical illness is a result of physical considerations or outside biological causes; on the other side, some hypothesize that all human illness is the product of an individual's psychological state. Supporting the former polarity, many physicians continue to deny the influence of the mind in healing the body. Supporting the latter view, Hay (1984) contends that the mind is the ultimate ruler and designer of health and disease. Her book lists human complaints with parallel, positive affirmations created to reverse the negative thought framework from which these diseases have arisen. Daily repetition of the appropriate affirmation is expected to recreate a new physiological framework from which good health may result. This view of the

"mind causing it all" has provoked attack from several quarters. For example, Wilbur and Wilbur (1988) warn the public against the psychological side effects of accepting this "one-sided" philosophy. They fear that a person's failure to reverse a disease using the mind alone may result in psychological scarring more devastating than the original physical ailment.

Somewhere along a continuum between the polarities of mind/body and causation/cure are found several well-known researchers in the fields of medicine and psychology. Siegel (1986) asserts that, although human beings may not be personally responsible for the onset of their physical and/or psychological ills, they are empowered with the natural ability to aid their own healing processes by loving themselves and by willing themselves to become healthy. Achterberg (1985), whose practice focuses mainly on cancer and AIDS patients, concurs with Siegel's findings. She states that maintenance of a positive mental attitude coupled with repeated imaging of oneself as whole and healthy, has shown positive results for her clients. These and other contemporary researchers support a more wholistic approach to medicine, psychology, and spirituality. They view human beings as an integration of mind, body, and soul and further propose that each individual may have a share in the task of attaining and maintaining personal good health

and well being. The following section of this paper provides an overview of the literature available concerning different perspectives of the mind/body interaction.

Physical Body Initiates Alterations of Mind

Barron, Jarvik, and Bunnell (1964) report the history of drugs used to alter the human psyche. They state that in primitive societies, it was understood that ingestion of specific plant properties would result in altering not only body chemistry but also consciousness. The ancient Aztecs claimed to enter inspirational states of mind by eating peyote and hallucinogenic mushrooms. During the 19th century, the Mescalero Apaches, the Commanches, and the Kiowas transformed the ingestion of the Mescaleros peyote, known today as Mescaline, into a rite of transcendence. Today, Mescaline and LSD are used to relieve boredom or stress by altering the mind. It is said that these drugs produce distinctive changes in the user's perceptions, sometimes referred to as "hallucinations."

In this century, researchers have identified and correlated abnormal levels of specific chemicals in the body with the presence of mental imbalance and disease. For example, Mescaline (as used by the Mescaleros) has been found to bear a great structural resemblance to the adrenal hormone epinephrine, and LSD has been found to be closely

connected to serotonin. Both epinephrine and serotonin are neurotransmitters capable of exciting or inhibiting the transmission of electrical impulses across synapses. Metabolic errors in the production of both substances have been correlated with various stages of schizophrenia: (a) overproduction of epinephrine and serotonin produce excitability and hallucination; and (b) underproduction of serotonin produces catatonic and depressed states.

Himwich (1955) provides additional insight concerning how medically prescribed drugs alter the human psyche. He states that Chlorpromazine (Thorazine) inhibits the reticular activating system by preventing some stimuli from reaching the cerebral cortex. This physiological blockage evokes a parallel mental blockage allowing the patient to remain aloof from imaginative creations and overly emotional situations. Additionally, Reserpine, although a stimulant to the reticular activating system, represses the hypothalamus and thereby produces a calming mental set. Himwich clearly states that both drugs produce fundamental alterations in brain chemistry which directly result in changes in mood and behavior.

Mood and behavior can be influenced by substances other than drugs. Feingold & Feingold (1979) found that removing sugar from the diet of hyperactive children can produce attitudinal and behavioral changes. The National Safety Council manual (1984) states that ingestion of excessive

amounts of alcohol mentally impairs perception and judgment to the point that 50% of yearly vehicular accidents are directly related to alcohol consumption. Research validates the concept that physical substances can alter not only physical but also mental chemistry to evoke observable changes in human mood and behavior.

Mental Processes Initiate Physical Changes

Some phenomena appear to defy all known physical laws. One example is the firewalker who walks barefoot over glowing, red embers without injury. Another example is the individual who is able to lie upon a bed of nails without sustaining as much as a break in the skin. What is the variable that renders the physical body impervious to the "normal, expected" physical responses to physical stimuli? According to Kroeger (1977), the answer lies in the power of the mind to create an imaginary setting so real that the body responds to the imaged rather than the "true to life" setting. The following research is presented to substantiate these phenomenon.

Three studies using biofeedback measurements as the dependent variable clearly demonstrate the technique of mental imaging to produce bodily changes. Jacobsen (1930) had subjects imagine flexion of one arm only. While EMG measurements recorded no change for the unimaged arm, increases in muscle tension were recorded for the arm wherein flexion had been envisioned. Rowland (1936) found

that imaging exciting scenes resulted in notable change of Galvanic Skin Response, heart rate, and respiration. Barber and Hahn (1964) reported that when subjects imaged their arms immersed in cold water, EMG readings showed increases in forehead muscle tension as well as an increase in heart rate.

Using instrumentation to measure the electrical current emitted from the spinal cord, brain, and extremities, Becker and Seldon (1985) described a study in which the mind was able to reverse the natural current potentials of the body. Becker had discovered that when the body was at rest, the brain and spinal cord emitted a positive potential and the extremities emitted a negative electrical potential. Upon allowing his subjects to enter a "trance state," he noted that the electrical potential of the head became less positive-often reaching a reading of zero. He further reported that when these subjects were given verbal suggestion for pain reduction in one arm, the electrical potential of that arm reversed from negative to positive. This similated the effect of an injection of procaine, a local anesthetic.

Of further interest to the mind/body interaction is the work of a neurophysiologist. Funkenstein (1955) discovered a way to map the physiological path of a mental "essence." He stated that it was possible to understand how a specific emotion was expressed in terms of bodily function. By testing both college students and psychotic patients, Funkenstein

concluded: (a) anger and fear produce recognizably different physiological reactions, (b) anger directed outwardly produced physiological reactions similar to those following an injection of nor-adrenalin, and (c) depression and anxiety produce behaviors similar to those following an injection of adrenalin.

Although such research is highly revealing, it is also highly technical. For the aspects of this research two terms simply illustrate the mind to body interaction. These are: psychosomatic disease and placebo effect. In the American Heritage Dictionary (1985, p. 1000), the word psychosomatic is defined first as pertaining to both the physiological and the psychological or to the somatic and the psychic. Further, one with a psychosomatic disease is defined as a person who experiences bodily symptoms as a result of mental conflict. The same source (American Heritage Dictionary, 1985, p.946) defines placebo in the medical sense as a substance that contains no medication and is given merely to humor the patient. From the research viewpoint, a placebo is defined as an inactive substance given in experiments as a control or as a substance which lacks intrinsic remedial value given merely to humor the patient (American Heritage Dictionary, 1985, p.946).

Achterberg (1985) clearly describes the placebo effect. She states that since no true medical intervention is

employed, the ultimate healer in the placebo effect is truly one's own imagination. (Achterberg clarifies that the result achieved is not synonomous with the imagination, but occurs through its use.) Cousins (1981) further elaborates this concept by saying that the human belief system constitutes the principal ingredient. Frank (1974) concludes that the potency of the placebo is derived from the belief in the power of the one prescribing or administering it.

A very powerful illustration of the placebo effect, embodying all the aforementioned criteria, is provided by Siegel (1986). He tells of a psychologist working with a patient diagnosed as having extensive lymphosarcoma. When all therapeutic intervention had been reduced to making the patient's "passing" comfortable, the patient heard of an experimental drug, Krebiozen, being tested as a possible cure for lymphosarcoma. He applied to become a test subject but was rejected due to his poor prognosis. Despite this rejection, he begged his psychologist to give him the drug. Not expecting this man to live, the psychologist agreed. Three days later, after a single injection of Krebiozen, X-rays were taken. His X-rays, unlike those of other research subjects, showed marked improvement in the condition. Injections of Krebiozen were continued for an additional ten days. On the tenth day, the patient was released with complete remission of his disease. Two months after hospital

release, the patient heard a media broadcast stating that Krebiozen was worthless for cancer treatment. Within a few days, the patient was re-admitted to the hospital in a near terminal state. This time, the psychologist decided to test exactly what was happening to his patient and elected to employ a placebo. He informed his patient that the news concerning the inefficacy of Krebiozen was not the full story and that the drug batch used for testing had been spoiled. He assured his patient that a new, "good" batch would probably turn out to be a wonder cure for his disease. The psychologist deliberately delayed giving injection to build his patient's hopes. When he felt his patient's hopes were at a zenith, he began treatment. Although he told his patient he was being injected with a fresh batch of Krebiozen, the only substance being administered was a single injection of water. Following this single injection, recovery from the patient's near terminal state was even more rapid than before. He was released again, the picture of health. Within two months, however, the media broadcast its negative findings about Krebiozen. The patient heard this broadcast, and within three days he was readmitted to the hospital in worse condition than before. With the patient's last hope of cure gone, he succumbed in fewer than two days. Although most cases of cure by placebo do not present such a dramatic or tragic profile, Siegel (1986) states that statistics show that

the placebo effect is the variable responsible for one-quarter to one-third of all patient cures.

Through centuries, there has been evidence of a belief in the mind/body interconnection. At times, this concept has held popular sway; at other times, it has not. Today, new interest has developed bringing with it both the wisdom of the past and the quantitative and qualitative tools provided by a more advanced scientific framework. Both past and present research adequately supports the validity of this interaction.

The purpose of the present research has been to review one specific aspect of the mind/body interaction. The final section of this review of literature will deal directly with this aspect: the power of verbal suggestion to effect change in mind and body.

The Power of Suggestion

Although the placebo effect and suggestion operate from the same principles of belief, expectation, hope, and faith, there is a difference between these two concepts. This difference rests in the nature of the suggestion offered to the placebo recipient, i.e., the suggestion is always untrue. Therefore, without a doubt, the sole element involved in the placebo effect is the imaginative powers of an individual's mind (Achterberg, 1985). In contrast, the suggestion may employ a statement of expectation that may be either of the following: (a) completely true, (b) partially true and

partially false, (c) completely untrue, and (d) affected by the state of consciousness in which recipients find themselves at the moment of reception. After these differences are explained, the mechanics of both processes are identical. If the idea suggested is internalized without judgment and is assimilated into the individual's belief system, the mind can make the appropriate neurochemical alterations to produce behavior in accordance with the suggestion.

The potency of verbal suggestion is clearly documented in the literature of hypnosis. Kroeger (1977) explains this potency by stating that in a relaxed state, the individual's consciousness is altered to provide a better "doorway" to the subconscious which, he claims, is the doer, activator or non-doer, destroyer of the human system. Johnson (1989) recounted a successful use of medical suggestion given a patient in a light hypnotic trance. The victim, burned over 75% of his body, was brought to a physician who practiced medical hypnosis. When his patient was in an altered state of consciousness, the doctor made the suggestion that his healing would be both immediate and scarless. The ordinary prognosis for such injury involves a recovery of at least six weeks with heavy scarring. This patient left the hospital within one week of injury, fully healed and minimally scarred.

The continued survival of suggestion delivered in a "trance" state as an accepted medical procedure speaks well

for its effectiveness. Today, commercial tape marketing firms are claiming equal effectiveness for suggestion given in states of consciousness more akin to waking than to trance states. Entire taped programs are being marketed in which verbal suggestion is audibly or subliminally coupled with various kinds of "relaxing" music or sounds of nature. One can now purchase such suggestive tapes for weight control, increased sexuality, enhanced monetary reward, lessened stress and anxiety, or practically whatever one could imagine. It is expected that the music will enable one to relax sufficiently to internalize the suggestion, whether audible or subliminal. Although some research denies the effectiveness of taped subliminal suggestion (Vokey & Read, 1985), other research supports its value (Stark, 1989).

In conclusion, the essence of marketing is the power of suggestion. The hope of the marketer is to convince the consumer that the product will do whatever it is expected to do. The world of music advertising is no different than any other marketing world. This study proposed to test the power of suggestive statements used to market one musical product to alter human psychological and physiolgical response.

CHAPTER III

Methods

Subjects

Subjects for this study included 30 female college students enrolled at Texas Woman's University. They ranged in age from 18 to 46 with a mean age of 24.8 years. Volunteers were solicited from various psychology classes. Each volunteer was contacted either by phone or in person and was screened for participation. Volunteers who were music majors were refused participation in the study. Diversified majors, exclusive of music, represented the subject population. Seventeen subjects were assigned to the treatment group, and 13 to the control group.

Design of Study

The design of this study was a pre-test post-test control group design (Campbell and Stanley, 1963). The independent variable was the presence or absence of a statement of suggestion or expectation. This design yielded two groups: (a) New Age music only (N=13) and (b) New Age music plus preceding statement of expectation (N=17).

Apparatus

The electrodermal response was measured with an HRM Biofeedback Microlab consisting of an interface module and a computer software disk connected to an Apple II+ computer.

Standard silver electrodes were applied with electrode paste to the first and third fingers of each subject's non-dominant hand. A sub-threshold direct current of 10 microamperes was delivered through these electrodes. Although the sensitivity control remained constant for all subjects, the centering control was varied to accommodate the differences in subjects' skin conductance. An Image-Writer printer was used to print means calculated from each subject's 3-minute pre-and post-tests.

The statement of suggestion (Slap, 1987), was read to the experimental subjects prior to their listening to the music tape (see Appendix C). The New Age music used for testing was commercially recorded under the name of "Astral Massage" (Slap, 1987). It consisted of flowing, sustained environmental sounds combined with fragments of atonal, arhythmic melodies produced by either synthesizer or flute. It was played back to subjects through a Panasonic tape player, a Pioneer stereo receiver Model SX-737, and two Frazier speakers placed at an equal distance from each subject. The decibel level for this music was preset and constant throughout the listening assignment. Subjects were seated in a reclining chair throughout the pre-test, listening, and post-test phases.

Dependent Measures

The dependent variable for this study was the subjects' state anxiety as measured by EDR and by self report on the State-Trait Anxiety Inventory, Form Y-1.

For more than a century, use of electrical discharges in the skin (previously termed Galvanic Skin Response) have been employed as a research measurement of anxiety. However, according to Fischer-Williams, Nigl, and Sovine (1986), only recently has the linkage between electrical skin changes and the onset of activity of the sympathetic nervous system been established. Now GSR, encompassed under the umbrella term of electrodermal response (EDR), is accepted as a physiological expression of variation in anxiety states.

For example, Peretti and Swenson (1974) used GSR to measure anxiety levels of 100 male and 100 female students whose task was to complete a pencil maze under pressure. Comparing conditions of music or silence, GSR measurments indicated significant reduction of anxiety with music. Zimny and Weidenfeller (1963), also found a significant correlation between subjects' GSR scores and change in their emotional states due to music listening. In both studies electrical impulses registered changes in skin resistence consistent with the presence or absence of subjects' anxiety or arousal. Electrodermal response is considered a valid measure of changes in emotional states (Fischer-Williams, Nigl, & Sovine, 1986).

The original State-Trait Anxiety Inventory (STAI-Form X) was developed as a research tool to measure both state and trait anxiety by Speilberger, Gorsuch, and Lushene (1970). Its present, revised form (STAI-Y) (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983) consists of two sets of 20 questions which take approximately five minutes to complete. The STAI State (Form Y-1) was used in this study. Subjects were asked to answer all questions according to how they felt "right now, at this moment."

Validity of the original STAI Form X was established through testing of 600 medical, psychiatric, and surgical patients, 200 prison inmates, and over 600 high school and college students (Spielberger, Gorsuch, & Lushene, 1970). Further factor analyses of this form (Kendall, Finch, Auerbach, Hooke & Mikaulka, 1976) clearly established the validity of the state scale. The revised STAI Form Y was additionally tested for construct validity with 1,728 male recruits in U.S. Air Force basic training and with 222 female and 202 male high school students (Spielberger, Vagg, Barker, Donham, & Westberry, 1980). Results clarified further that two distinct types of anxiety, state and trait, were being measured. Test re-test reliability, however, was found to be relatively low. Coefficients ranged from .16 to .62 with a median reliability coefficient of .33 (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). This finding is consistent

with the nature of state anxiety.

The STAI has been the most widely employed self-report measure of anxiety in psychological research conducted in the past 13 years (Spielberger, Gosuch, Lushene, Vagg, & Jacobs, 1983). Both its validity and reliability have been extensively tested and clearly established.

Procedure

The researcher assigned subjects randomly to experimental and control groups by coin toss. Individual appointments were made for each subject with a planned duration of approximately one hour. Upon each subject's arrival for testing, the researcher read the consent form aloud and asked each subject to sign it (see Appendix A). The subject was then given a complete verbal overview of what she would be doing in the testing session. She was asked to wash her hands and to prepare for a testing session of 35 to 45 minutes. Upon return, she was asked to complete the STAI State (Form Y-1). Each subject was then seated in a recliner chair, and the researcher--while explaining what the electrodermal equipment would do--connected the subject to the electrodes. The researcher further explained that from this point on, the subject must remain both quiet and as motionless as possible to provide for accurate electrodermal measurement. It was requested that the subject close her eyes for the duration of the testing to control for external distractions. A 1-minute

orientation was provided for the subject to become comfortable with the equipment, and then a 3-minute EDR baseline was taken. Upon completion of baseline, the music and/or statement of suggestion was immediately begun. After 15 minutes of the music listening procedure, a 3-minute electrodermal reading was taken--this time without verbal notification to the subject. During the entire listening procedure, the researcher remained quietly to the side of the subject. The researcher was thus able to test the subject without her being consciously aware of when the second electrodermal reading had been taken. At the end of the music listening assignment, the subject was asked to open her eyes once again. The researcher removed the electrodes from the subject's hand and encouraged her to get up and stretch. The testing procedure was completed by having the subject answer the 20 questions of the STAI (Form Y-1) post-test in the same manner as the pre-test. The subject was thanked for her participation in the study and invited to see the computer printout of her pre and post EDR measurements. An informal interview regarding the subject's opinion of the music, whether she visualized during the music listening, and how she generally felt during the testing was conducted. Each subject was assured of the confidentiality of her testing results and was invited to indicate whether she would like to be informed of the conclusions drawn from the study.

Hypotheses

The following hypotheses were tested in this study.

H_o1: No significant difference will be found in post-test levels of anxiety as measured by the STAI State Form Y-1 between the experimental group (music plus expectation statement) and the control group (music only).

H_o2: No significant difference will be found in post-test levels of anxiety as measured by electrodermal response between the experimental group (music plus expectation statement) and the control group (music only).

Data Analysis

Two analyses of covariance using pre-test scores on each variable as its own covariate were used to test the null hypotheses. The researcher employed the SPSSX computer program MANOVA to obtain statistical results.

CHAPTER IV

Results

Preliminary Data Analysis

Separate Bartlett-Box F tests for homogeneity of variances were conducted on pre and post-test scores of the dependent variables (see Table 1). Results of these tests indicated that the assumption of homoscedasticity had been met for these variables. Therefore, it was concluded that analysis of covariance was an appropriate statistic for assessing post treatment differences.

Table 1

Bartlett-Box F Tests for Homogeneity of Variances for Pre and Post-Test Anxiety Variables

Variable	df	Bartlett-Box F	p
STAI-PRE	1,2227	1.26948	.260
EDR-PRE	1,2227	1.41012	.235
STAI-PO	1,2227	1.08725	.297
EDR-PO	1,2227	2.42011	.120

To study the effect of suggestion on state anxiety, two one-way analyses of covariance were performed on the two post-test state anxiety measures using the pre-test scores on these variables as covariates. These results can be found in

Table 2 and Table 3. They indicate no significant treatment effect for either variable. The adjusted means for these analyses (see Table 4) confirm acceptance of the null hypotheses.

Table 2

One Way ANCOVA for STAI Post-test Scores using STAI pre-test scores as covariates

Source	df	SS	MS	F	P
Between groups	1	1.138	1.138	.056	.815
Within groups	27	547.898	20.293		
Regression	1	420.030	420.030		

Table 3

One Way ANCOVA for EDR Post-test Scores using EDR pre-test scores as covariates

Source	df	SS	MS	F	P
Between groups	1	.649	.649	.074	.787
Within groups	27	235.383	8.717		
Regression	1	2019.472	2019.472		

Table 4

Adjusted Cell Means for Two Post-test Anxiety Variables

STAI-PO	Control	26.613
	Experimental	27.010
EDR-PO	Control	5.561
	Experimental	5.858

CHAPTER V

Summary, Discussion and Recommendations

The purpose of this study was to compare the effects of music listening upon anxiety levels with or without an initiating statement of expectation. The statement of expectation claimed that the music had been composed for the purpose of reducing anxiety levels within the listener and that scientific research tended to support this result.

Thirty female college students were randomly assigned to two groups: (a) New Age music only (N=13) and (b) New Age music plus statement of expectation (N=17). All subjects attended one testing session of approximately one hour in length. The experimenter for the study was a Registered Music Therapist, and all sessions were conducted by this therapist. Testing took place in a fairly quiet, carpeted room in the university music building during hours when interruptions and noise were anticipated to be minimal.

The music for the study was chosen because of marketing claims which categorized it as "New Age". The researcher confirmed this classification by comparing the music's form with that provided by several "New Age" researchers/composers (e.g., Isacoff, 1989).

The independent variable for this study was a suggestion statement indicating that scientific research had

clearly demonstrated the efficacy of the music to induce states of relaxation and homeostasis in subjects.

Dependent measures for this study were the state form STAI-Form Y1 and electrodermal feedback, each an index of anxiety level. Considerable validity and reliablility data are available on both measures supporting their use for this purpose.

All subjects were pretested on the STAI and by a 3-minute electrodermal reading. Both groups listened to a 20 minute segment of taped "New Age" music. Experimental subjects heard the suggestion statement prior to hearing the New Age music, while control subjects did not. Recordings of EDR were obtained from subjects of both groups after 15 minutes of music listening. At the end of the listening period, the STAI state form was again completed by each subject.

Null hypotheses for this study were tested using the MANOVA program of Statistical Package for the Social Sciences--SPSSX. These hypotheses and the results of these analyses may be summarized as follows:

H_o 1: No significant difference will be found in post-test levels of anxiety as measured by the form Y-1 of the STAI between the experimental group (music plus expectation statement) and the control group (music only).

No significant difference was found, so this hypothesis was accepted.

H_o 2: No significant difference will be found in post-test levels of anxiety, as measured by electrodermal feedback, between the experimental group (music plus expectation statement) and the control group (music only).

No significant difference was found between the groups, and this null hypothesis was also accepted.

Discussion and Recommendadion

Several possible explanations for the non-significant effect of the statements of suggestion upon subjects' anxiety levels could be postulated. One explanation of particular interest to the field of music therapy is the possibility that the music itself--as claimed by the marketer--was truly a relaxing agent requiring no additional verbal reinforcement to produce its desired effect. Possible support for this viewpoint was noted by this researcher through information gathered in an informal post-test interview. Such information was: (a) all but four subjects were surprised at the level of relaxation they achieved during testing; (b) over 50% of subjects stated that the music enabled them to relax to a greater degree than they have ever before experienced; (c) comparison of pre-and post-test STAI scores indicated all but one subject experienced some lessening

of anxiety, and (d) comparison of pre-and post-test electrodermal means indicated reduction of anxiety levels in all but four subjects.

Other possibilities for non-significance of results are: (a) the limited number of subjects used for this research; (b) single rather than repeated presentations of statements of suggestion, and (c) failure to control for "adaptation" (Shellenberger & Green, 1986). Finally, one might hypothesize that presentation of the statements of suggestion by a figure representing recognized authority to subjects may have altered the present results. Support for this final hypothesis was gained through a television broadcast entitled "The Mind in Pain and Healing" (BBC/WNET, 1989). The narrator related facts of a study employing the placebo effect. Impacted wisdom teeth were surgically removed from two male patients. Within four hours of surgery, subjects were offered relief of pain. To one patient, a member of the hospital staff administered a dose of distilled water stating that the injection was a recognized pain killer. To the other patient, the doctor, himself, administered a dose of distilled water also suggesting that the injection was a recognized pain killer. Results showed that although both patients demonstrated decrease of pain, the patient to whom the doctor had administered the medication showed significantly greater and more long lasting reduction of pain symptoms.

Reasearch adequately supports the effectiveness of both verbal suggestion and certain types of music to alter human behavior. Stress is a behavior that needs remediation within contemporary society. Since more than 85% of the subjects in this present research perceived themselves as less anxious after listening to either New Age music or New Age music plus suggestion, it is felt that further investigation of this subject is warranted. It is recommended that this research be replicated and expanded to test additional variables. Using the pre-test post-test control group design (Campbell & Stanley, 1963), subjects might be assigned to one of the following four groups. These are: (a) New Age music plus statement of suggestion presented by a recognized authority figure; (b) New Age music plus a taped statement of suggestion; (c) New Age music only, and (d) silence. A period of adaptation would be allowed. Pre-and post-test measures would be expanded to include several methods of physiological measure as well as self report. The introduction of an anxiety producing instrument along with a markedly increased subject population might further enhance the value of such research.

Historically, words and music have rated as a powerful "dynamic duo". Performance of national anthems evoke mass loyalty from peoples and nations. Words of folk songs may suggest criteria that can change the moral structure of a

society. With proper scientific research, perhaps the power of words and music can be harnessed to fulfill an urgent, contemporary need--to find a safe, available, economical, pleasant alleviant to stress and anxiety.

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APPENDIX A

Informed Consent Form

The Department of Performing Arts at Texas Woman's University supports the practice of protection for human subjects's participating in research. The following information is provided so that you can decide whether you wish to participate in the present study. You should be aware that even if you agree to participate, you are free to withdraw at any time.

This study is concerned with determining the physiological and psychological effects of listening to selections of music termed "New Age" by its composer. All subjects will be asked to fill out a questionaire revealing how she rates her level of anxiety at the moment of completing the form. This procedure will be asked of the subject both prior to and after the listening assignment. In addition, prior to listening to a tape containing twenty minutes of music, all subjects will be asked to place electrodermal feedback sensors upon two non-adjacent fingers of their non-dominant hand. These sensors will measure the conductance level of a below threshold current being emitted from one of the EDA sensors through the subject's skin. Equipment instructions for this biofeedback instrumentation

state openly that the current being emitted by the sensor will not be felt by the user. Two three-minute measurements of skin conductance will be required of the subjects: 1) prior to the listening procedure and 2) after seventeen minutes of listening to the music.

Your participation in this study is solicited, but strictly voluntary. Do not hesitate to ask any questions about the study. Be assured that your name will not be associated in any way with the research findings. I appreciate your cooperation very much.

Sincerely yours.

Joyce C. Parmentier
Principal Investigator
Department of Music and Drama
(817) 387 1124

I have read the description of this study, including a fair explanation of the procedures of their purpose. An offer has been made to me to answer all questions about the study. I understand that my name will not be used in any release of the data and that I am free to withdraw at any time. I further understand that no medical service or compensation is provided to subjects by the university as a result of injury from participation in research.

_____

Signature of subject agreeing to participate.

APPENDIX B

Verbal Introduction to Subjects

First of all I would like to thank you for participating in this study. The entire procedure should not take us more than forty-five minutes, and in actually, our time will probably run thirty-five minutes. As stated in the explanation in the consent form, the study will involve the use of biofeedback, listening to music, and filling out a self-report form both prior to and after the conclusion of the listening assignment. If you have any questions at all during this procedure, you are welcome to ask. I only request that during the biofeedback and listening segments, that you remain quiet. Have you any questions now?

In order that the biofeedback equipment gives us an accurate reading, and to enable us to complete the testing procedure without interruption, I would ask that you visit the rest room. I especially ask that you clean your hands well with soap and water as this can make a difference in biofeedback accuracy. The rest room is right down the hall to your right. I'll have everything ready for you when you return.

Thank you. Before we begin, do you have any questions

for me? If not, I would like you to fill out this form. This is a form which is to be answered in the framework of how you feel right now, at this present moment. The directions are at the top of the form, and I'll read them aloud with you. (Read directions). Are there any questions? Then please fill out the form. Thank you. (Collect form)

Now if you would come over here and sit in this recliner chair, we'll begin with the biofeedback. Are you comfortable? If you find your waistband, watch, shoes or whatever restricting to free blood circulation, I would suggest you release it, and truly make yourself comfortable. Let me know when you are ready to proceed.

Are you right-handed or left-handed? Thank you. I will be placing these little "sensors" on you ring and index fingers of your _____ hand. These will provide us with a physical readout of your basic level of present anxiety/relaxation. As soon as we have these connected we will take a trial to see if all the equipment is working. (While connecting the sensors, I will say the following.)

In case you are wondering how this biofeedback equipment works and what it measures, while I am attaching these sensors, I'll explain. This particular type of biofeedback is called electrodermal-EDR for short-feedback. Originally it was called Galvanic Skin Response-after the man who discovered its usage-and basically works on the

principle of what we have come to know as the lie detector. Although you will not feel it, a tiny, tiny microvolt of electricity will be passed through your skin. The reading that we will obtain from this epidermal passage of electricity will depend upon the amount of "sweat" that is being emitted from your palmar sweat glands. Since these sweat glands are exclusively innervated by the sympathethic nervous system-that part of the autonomic system that is basically responsible for arousal-this measurement will accurately reflect the relative activation of the sympathetic nervous system. Greater activation will connote greater release of sweat on the palmar surface through the skin. This conduction rate is exactly what we will be measuring.

Now, since the sensors seem stable and properly attached, I would like you to place your _____ hand on this arm rest. Due to the sensitivity of the electrodermal equipment, it is necessary that you remain entirely still with no movement anywhere, except, of course for your breathing. Talking also, will change the measurement, so I must ask that you remain silent as well as still. If you are feeling comfortable now, I'd like you to close your eyes to avoid any visual distractions and I'll give you the final run-down of exactly what will take place in this testing part of the procedure.

First, I shall let you settle down for one full minute before I begin the electrodermal monitoring. I shall monitor for three minutes. After the baseline measurment has been completed, it will be immediately followed by the listening assignment. There will be no break between these two procedures. There will be twenty minutes of music, and once again I ask that you keep your eyes closed throughout all testing thereby allowing you to focus your complete attention on listening to the music. I shall leave the electrodermal sensors attached to your fingers as I shall-sometime during the listening procedure-once again monitor your level of arousal. At the end of the tape you are welcome to once again open your eyes. I shall then remove the sensors and you can get up, run around the room, stretch, etc., but for this 24 minute testing period, I once again request that you remain perfectly quiet and still. Do you have any questions? Let's begin.

(After the listening assignment and measurement is completed, the following will be said.)

With the listening assignment now completed, you may open your eyes and I shall remove the sensors. After you stretch a bit and bring motion back to your body, I'd like you to complete the final task of this session. Once again, if you would come over to the table and fill out the same type of self-report questionnaire as you did prior to the

listening assignment, this will complete our session. Please note again, that the instructions are exactly the same as before and that it is to be filled out in the framework of how you feel at this present moment. (Read instruction)

If you would like, please place your phone number on this form on the top right hand corner and I can notify you concerning results of the study. Please be assured that all information gathered within this session will be used for research only. That subjects will be known only by a number, and that your phone number-if you choose to provide it-will be the only linkage to you as an individual with a particular personal identity.

Thank you so much for coming and participating. I would appreciate your not mentioning what has taken place here to any others who you know will soon be tested for this project prior to testing. Afterwards, (after mutual testing) there is certainly no restriction at all. Once again, thank you for your time and cooperation.

APPENDIX C

Statement of Suggestion

The music to which you will be listening shortly has been termed by its creators as "something that does more". {This music} has been scientifically proven to produce dramatic changes in consciousness. Listeners achieve serene and relaxed states. Meditation groups, yoga classes, hospitals and institutions use this music to create a soothing, healing, environment....

Recent scientific studies of the relationship of music to the illness of the body and mind have yielded some startling results. {The kind of music you will hear in a minute has proven} far superior even to classical music in producing dramatic changes in consciousness as measured {by} scientific instruments. Listeners transcended both levels of awareness achieving serene and relaxed states.

{Additional testing of this music has demonstrated its ability to deepen} breathing patterns, which help regulate blood pressure and relax the body and mind (Slap, 1987).