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**COMPARISON OF THE EFFECTS OF BIOFEEDBACK ASSISTED TREATMENT  
ON THE REDUCTION OF STRESS AMONG AFRICAN-AMERICAN  
AND WHITE EMPLOYEES**

by

**Ollie G. Barnes, III**

**A Dissertation  
Submitted to the  
Faculty of The Graduate College  
in partial fulfillment of the  
requirements for the  
Degree of Doctor of Education  
Department of Counselor Education  
and Counseling Psychology**

**Western Michigan University  
Kalamazoo, Michigan  
December 1990**

# COMPARISON OF THE EFFECTS OF BIOFEEDBACK ASSISTED TREATMENT ON THE REDUCTION OF STRESS AMONG AFRICAN-AMERICAN AND WHITE EMPLOYEES

Ollie G. Barnes, III, Ed.D.

Western Michigan University, 1990

Seventy-four employees at an internationally based Fortune 500 corporation participated in a comparative biofeedback study. The study was designed to determine whether there is a difference in the way African-Americans and white Americans respond to biofeedback-assisted stress management treatment. The study also serves as a springboard for increasing the quantity of empirical literature in the area of biofeedback in general and biofeedback using African-Americans as subjects, in particular. The researcher randomly assigned the employees to one of three groups (biofeedback, traditional, control). Each subject was assessed on six variables: state anxiety, trait anxiety, heart rate, skin temperature, blood pulse height, and electromyography across the frontalis (EMG). A within-group analysis of the results suggested that these two groups did not respond statistically differently under biofeedback conditions, except for one variable (blood pulse height). While these groups showed no statistical differences in response to biofeedback-assisted stress management treatment, the results tend to suggest trends that are important for clinicians who conduct biofeedback treatment with African-American patients. The largest trend was that white Americans in the biofeedback group showed a greater rate of improvement than the African-Americans on every variable.

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on the reduction of stress among African-American and white  
employees**

**Barnes, Ollie Garfield, III, Ed.D.**

**Western Michigan University, 1990**

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## DEDICATION

I would like to dedicate this research and the completion of my doctoral training to my parents. To my mother, Marlene “Judy” Barnes who passed away midway through my doctoral training: in body we did not get here together, but in spirit you were never far away. It was often your love and encouragement that created the deeply held belief that “I can achieve . . .,” and I will always find comfort and strength whenever I think of you. To my father, Ollie G. Barnes, Jr. who provided a clear understanding of hard work, honesty, and an excellent role model of a strong African-American male: thank you!!

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Ollie G. Barnes, III

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## CHAPTER I

### THE PROBLEM AND THE BACKGROUND

Competition, mergers, layoffs and the pressure that your best effort needs to be better are starting to take their toll on the American work force. Stress has been reported to be taking over the work place in epidemic proportions for several years (Pelletier & Lutz, 1988; Siwolop, Rhein & Weber, 1988). "Stress is an adaptive response, mediated by individual characteristics or psychological processes that are consequences of any external action, situation or event, that places special physical and/or psychological demands upon a person" (Dubinsky, 1985, p. 30). With the ever increasing level of uncertainty about the future job security of those working in business and industry, the prevalence of stress disorders is likely to increase. Currently, stress disorders have been reported to account for as much as 60% to 90% of the visits to healthcare professionals (Cummings & Vandebos, 1981; Elite, 1986). In the 1987 November issue of the Small Business Report, a reported 11% increase was registered in the number of stress-related insurance claims between the years 1981 and 1987 ("Stress-related Workers' Compensation Claims," 1987). This is a dramatic increase over the previously reported 4.7% in 1980. Based on experimental and clinical research, stress was determined as a major factor in a wide range of medical conditions (Pelletier & Lutz, 1988). The list includes such medical disorders as hypertension, cardiovascular disease, gastrointestinal disorder, tension and vascular headaches, lower back pain, and decreased immunological functioning. Pelletier and Lutz (1988) state that this creates an elevation in susceptibility to colds, flus and cancer. Following the 1987 decline of the stock market, employees at all levels of the



American work force feared the loss of their jobs (Siwolop et al., 1988). Blue collar workers feared layoffs, as major companies were forced to cut back on production. Executives with as much as 30 years of service at a single company reported experiencing stress. These employees feared that their positions might be eliminated if their companies were forced to merge with other companies or sell out to larger, more powerful companies. Even employees who were close to retirement were forced to continue working. This was due to the substantial loss of savings, and retirement investments on October 15, 1987, which became known as "Bloody Monday" (Siwolop et al., 1988, p. 74). Not only were these older workers faced with the trauma of having to continue working, but also with the threat that they might be replaced. Companies are often more interested in younger, newly trained college graduates because they are better long-term investments for their companies.

The cause of employee stress and tension varies. Many employees report that tension often originates from areas such as job advancement competition, which is the competition between several employees seeking promotions for the same job (Siwolop et al., 1988). Some employees report experiencing pressure to maintain their current position. Mental health experts estimate that as much as 45% of American executives and managers are suffering from depression or critical levels of stress (Siwolop et al., 1988). As a result of the stress that seems to be assuming control from the factory floor to the plush executive office, workers report feeling less tolerant of family members' behavior. This generally leads to increased episodes of domestic violence. Increased stress levels also create intolerance among co-workers, which generally results in a drop in worker productivity and efficacy (Dubinsky, 1985; Siwolop et al., 1988).

While a situational stressor such as the decline of the stock market provides a highly visible and a legitimate precipitant for employee stress, other stress-producing elements remain more constant and are often more difficult to detect. For example, workers experience stress from the constant demand to produce more of a product, with fewer resources. Other stressors are limited job advancement opportunities, nonsupportive supervisors and uncertainty about job security. All these factors affect both the employee and the welfare of the employee's family.

Whether the stress-producing agent is acute or chronic, the results are the same. It has been reported that some employees respond to stress by drinking to excess, or abusing their children and spouses. Some employees allow their work performance to slip to intolerable levels, while others may accumulate large quantities of lost time. At more severe levels, employees can experience depression that is accompanied by suicidal ideations (Hipp, 1988; Seamonds, 1982; Siwolop et al., 1988).

The cost is high for both the employee and for the organization involved (Sheridan, 1987). The estimated cost to businesses for stress-related health problems, mental health insurance claims, disability claims, lost productivity, and additional expenses was approximately \$150 billion in 1987 (Siwolop et al., 1988). Hipp (1988) and Pelletier and Lutz (1988) have also reported that stress-related healthcare costs are increasing. Pelletier and Lutz (1988) state that, in 1987 of the \$511 billion budget for medical care, private corporations control approximately 43% of the total budget through the medical plans they purchased for their employees. They then suggest that within the next 10 years corporations will control as much as 70% of the healthcare plans available to the employee. This will occur as cost trends shift from the government sector to the private sector (Pelletier & Lutz, 1988).

As the incidence of stress-related health problems increases, employers continue to suffer great losses in the form of workers' lost time. Dollars are also lost from having to train new employees or from having to pay large amounts of money on stress-related disability claims (Cain, 1986). Because stress-related claims were the principal factor in occupational injuries in 1987, employers are developing more cost-efficient methods to care for their employees (Pelletier & Lutz, 1988). A nationally based corporation reported spending an estimated \$800,000.00 in 1985 on mental health services alone (L.D. Ireys, personal communication, February 15, 1986). This figure includes both inpatient and outpatient treatment.

One response to this problem has been the creation of employee assistance programs (EAP) and company wellness programs. These programs are designed to deal specifically with the management of employees' stress-related health problems. The growth of employee assistance programs for the 500 largest companies in the United States has increased from 65% in 1985 to 90% in 1988 (Elko, McConaghy, Jones & Brumbak, 1988; Griffith, 1987; Siwolop et al., 1988).

The employees of these large corporations are being serviced by highly sophisticated professionals, who have access to the most modern treatment tools in the clinical industry. These professionals are utilizing a wide range of clinical techniques to decrease the prevalence of stress in business and industry. Briefly, some of the techniques that are being employed are progressive muscle relaxation, deep breathing exercises, imagery relaxation, meditation, time management, goal setting, positive thinking exercises, and additional vacation days (Zastrow, 1984). While all of these techniques have been proven effective, the most recent technique added to this variety of treatment procedures is biofeedback (Allen & Blanchard, 1980).

Biofeedback is a process by which patients gain information about their external psychophysiological functions. Once this information is made known to the patient, he/she can be taught to control these functions by using basic relaxation skills. Biofeedback used in conjunction with the basic relaxation techniques has been documented as a useful treatment technique for treating stress and stress-related disorders in the white population (Allen & Blanchard, 1980; Greenspoon & Olson, 1986; Jacob & Chesney, 1984; McCaffrey & Blanchard, 1985; Peffer, 1984; Shellenberger, Turner, Green, & Cooney, 1986).

Due to the newness of biofeedback as a treatment modality, there is a small amount of empirical data that demonstrates its effectiveness across different cultural groups. Groups such as women, African-Americans, elderly, and the handicapped are currently under-represented in published literature.

This research is concerned with the effectiveness of biofeedback on African-Americans who work in these large corporate environments. Current literature suggests that the number of African-Americans who are securing managerial positions is steadily increasing at all levels (Hoskins, 1987). These managerial positions generally are accompanied by varying levels of stress (America & Anderson, 1979; Howard & Hammond, 1985; Jones, 1973). Due to the shortage of empirical data on biofeedback with African-Americans as subjects, this researcher fears that African-Americans who seek services from corporate clinicians may be treated with a technique that may not be fully effective when treating patients from this culture.

The effects of stress on African-Americans employees and white employees are taking their toll on the corporation as well as on the employees' families. While African-American and white employees may be faced with stress from different sources, the concern of this study is not to make a case for who has the most stress. It

is important that we do not generalize biofeedback's treatment success from one group to another group without first comparing data from both groups.

This has caused this researcher to generate three research questions, which are as follows:

1. Are there any differences in the way African-American employees and white employees respond to biofeedback treatment?
2. Do clinicians need to develop adjunctive procedures in order for biofeedback to be effective with the two cultures involved in this study?
3. Do African-American employees and white employees respond differently to relaxation induction techniques?

#### Operational Hypotheses

There is a difference in the effect of biofeedback as a treatment modality on the reduction of stress among African-American employees and white employees. Based on the research questions, the following hypotheses have been developed:

1. There is a difference in the way African-American employees and white employees respond to the state anxiety inventory.
2. There is a difference in the way African-American employees and white employees respond to the trait anxiety inventory.
3. There is a difference in the way African-American employees and white employees respond to the biofeedback measure of heart rate.
4. There is a difference in the way African-American employees and white employees respond to the biofeedback measure of body temperature.
5. There is a difference in the way African-American employees and white employees respond to the biofeedback measure of pulse height.

6. There is a difference in the way African-American employees and white employees respond to the biofeedback measure of neuromuscular.

#### Null Hypothesis

There is no difference in the effects of biofeedback as a treatment modality on the reduction of stress among African-American employees and white employees.

#### Purpose of the Study

The purpose of this study is to determine if there is a difference in the effects of biofeedback as a treatment modality in the reduction of stress among African-American employees as compared with white employees.

#### Significance of the Study

While biofeedback is rapidly becoming the treatment of choice for clinicians in all settings, there continues to be a shortage of empirical research on biofeedback in general (Allen & Blanchard, 1980) and biofeedback on African-Americans in particular (Turner & Jones, 1982). The value of this research has the potential to provide valuable treatment information for clinicians who are employing biofeedback as a treatment procedure in settings involving African-American adults. If the results of this study are congruent with the operational hypothesis, then clinicians will be charged with the development of adjunctive treatment procedures. These adjunctive procedures will allow biofeedback treatment to generalize across cultures.

#### Limitations of the Study

The only limitations that this researcher can anticipate are listed below.

1. Due to the selection process being voluntary, it is a possibility that there may not be enough African-American employees who will volunteer for the study.

2. Should the number of African-American volunteers be too low, this will limit the statistical analysis.

3. Due to the fact that this researcher is African-American and male, there could possibly be some interaction effect between the researcher and the employees that could affect the outcome of the results.

## CHAPTER II

### REVIEW OF RELATED LITERATURE

#### Corporation and Stress

The problem of stress and stress-related disorders is a serious one for American corporations. The severity of this problem has already been outlined in the introductory chapter. These corporations are pressed to find more creative techniques for dealing with this costly problem that appears to be assuming control from the factory floor to the plushy executive office. Siwolop et al. (1988) conducted an indepth review of the sources of corporate stress and its financial impact on the organization. They report that stress is responsible for as much as 45% of the health-related illnesses that are reported to corporate health officers annually. The financial impact of these illnesses costs companies in every aspect: lost time, doctor and hospital bills, and training of temporary and new employees. In addition, companies lose dollars from slowed down production of its major product (Elko et al., 1988).

Seamonds (1982) conducted research that measured the relationship of absenteeism due to illness between employees who received health evaluations and appropriate clinical referrals, and employees who received no evaluation and no referrals. Seamonds used 500 corporate employees as subjects in this study. Following a six-week treatment program, the results indicated a significant drop in absenteeism among those employees who received the health evaluations. This study provides evidence that corporations are affected heavily by employees' health related illnesses. It also illustrates that companies can benefit from attention paid to employees' health.



### Employee Assistance Programs

Employee assistance programs (EAP) and company wellness programs quickly became the answer to this corporate dilemma. Oher (1987) states that EAPs generally employ professionals such as psychologists, social workers, and substance abuse counselors. He reports that in some companies these professionals provide in-house clinical services such as individual psychotherapy, marital and family therapy, psychological testing, and treatment for recovering chemically dependent employees. Other companies may find the services of external employee assistance programs more convenient, and therefore choose to work on a referral basis only. The referral system means the employees are screened by an in-house professional and then referred to an appropriate treatment center outside of the company (Elko et al., 1988; Johnson, 1985). Whatever the method utilized, EAPs serve the function of (a) early detection of mental and medical problems, (b) providing conveniently located services, and (c) offering employees an alternative to using expensive outpatient and inpatient programs (Elko et al., 1988; Johnson, 1985; Oher, 1987).

Smaller companies that do not have the financial resources of larger companies may elect to develop wellness programs. These programs educate employees about how to care for their bodies. They provide services that include diet and nutrition counseling. Counselors offer classes that teach employees how to plan and prepare meals properly. In addition to nutrition classes, these programs offer health screenings such as blood pressure checks and early cancer detection testing. Some companies promote exercise as the best way to reduce stress and remain healthy. The companies may even provide facilities for exercise workouts. Some writers report that employee assistance programs are one of the fastest growing benefits in the American work place (Elko et al., 1988; Riggs, 1989). It was further reported that 30 years ago

fewer than 50 major companies offered any type of counseling assistance. Today more than 8000 companies, large and small, offer some form of counseling assistance to their work force (Elko et al., 1988).

Employee assistance programs have also been reported to be cost-effective when implemented properly (Smith, 1989). Elko et al. (1988) conducted a comprehensive review of literature reported to the National EAP Information Clearinghouse. These writers report that companies that employ workers that smoke or suffer from excessive levels of stress often cost their companies approximately 132 million days in lost time (absenteeism). This figure converts into an estimated one billion dollars in annual corporate loss.

The average cost for small to middle size companies to operate an EAP is approximately \$15 to \$20 per employee. This cost generally decreases as company size increases. According to Elko et al. (1988) employers can easily expect a \$5 return on every \$1 invested in an employee assistance program. For labor sensitive companies, this return has been reported to be as high as \$18 to every \$1 invested. This return on investment can also be seen from the perspective of increased employee productivity. Elko et al. (1988) reports that results from EAPs provide a win-win situation for the corporation.

Another major research contribution that supports the cost effectiveness of employee assistance programs is the study conducted by the McDonnell Douglas Corporation (Smith, 1989). The consulting firm of Alexander and Alexander Health Strategies was commissioned to conduct a study to test EAP's effectiveness. This group reported that in 1987 and 1988 companies found that for every \$1 invested in an EAP, they saved \$3, and in some cases as much as \$4.

While companies are turning more and more to psychologists and counselors to assist with the establishment of realistic mental health benefit programs, Penzer (1989) presents some concerns regarding the quality of care that is delivered to employees who are experiencing emotional illnesses. He states that corporations are often caught up in the concept of operating an EAP but generally allocate the larger portion of funds for medical treatment and whatever is left over goes toward the mental health component. He believes this will generally reduce the degree of effectiveness of these programs. Penzer (1989) states that corporations that ignore mental health programs or provide only minimal financial assistance will spend a great deal of money on the byproduct of emotional problems, which includes increased use of medical benefits.

#### Biofeedback

Biofeedback, at one time known as external feedback, was first used an estimated fifty years ago (Gaarder & Montgomery, 1977). The unfortunate aspect of its use during this time was that practitioners were unaware that they had discovered a new principle for conducting clinical treatment. It was during the middle 1960s that biofeedback enjoyed the distinction of being a newly developed treatment technique. Subsequently, biofeedback was adapted to a wide range of clinical disciplines (Brown, 1974; Gaarder & Montgomery, 1977; Murphy & Leeds, 1975; Stoyva, 1976).

Biofeedback brings together innovative procedures which enable an individual to gain useful information about his/her body, and then use that information to control those areas. Biofeedback has enjoyed its greatest success in the area of relaxation (Schneider, 1987). Biofeedback works on the principle of measuring a person's physiological state (heart rate, pulse height, skin temperature and muscle tension) and

then returning that information to the person almost immediately. Once this information loop has been completed, the patient can use the information to manipulate the area where the information was collected. The patient's goal is to use the information loop to lower his/her heart rate, decrease vasoconstriction, increase his/her skin temperature, or reduce his/her muscle tension. Most biofeedback machines will generally allow a patient to work on one or all of these areas simultaneously.

The message that is intended here is that biofeedback is successful when it is paired with other relaxation techniques. Rarely is biofeedback used as a single treatment technique. Biofeedback is generally part of a multimodal treatment package. In this context biofeedback is a powerful tool for assisting patients achieve a state of relaxation.

Since biofeedback has become a more popular treatment technique for assisting with the reduction of stress, several studies have been conducted that illustrate its effectiveness.

Peters, Benson and Peters (1977) conducted a 12 week study investigating the effect of daily relaxation breaks on the reduction of blood pressure. The subjects were the personnel of a large manufacturing corporation. They were divided into three groups: Group A was taught how to produce the relaxation response, Group B was taught how to sit quietly, and Group C was taught nothing. The results indicated that employees in group A showed the largest decrease in overall blood pressure. Group B showed more decrease in blood pressure than group C. Group C showed very little change between their first and last blood pressure measurements.

The concern with business and industry became the main focus of stress management research in the 1980s. Allen and Blanchard (1980) directed a study using 30 employees from the middle management of a large corporation. They trained these

employees once a week for 6 weeks on a combination of stress management techniques. These managers were taught deep breathing, progressive muscle relaxation, skin temperature control, frontal electromyograph (measure of muscle tension), cognitive stress management, and general relaxation skills. Significant effects were found in the self-reported measures, the state-trait anxiety inventory, and in all physiological measures involving biofeedback.

Yorde and Witmer (1980) conducted a study using a population of 38 university employees. This research study contained two independent variables. The first variable was a lecture-discussion format that presented cognitive relaxation skills. The second variable was biofeedback training to reduce frontal electromyograph (EMG). The dependent variables were two paper pencil scales. The first was the State-Trait Anxiety Inventory which was developed by Spielberger, Gorsuch, Lushene, Vagg and Jacobs (1970). The second dependent variable was the Subjective Stress Scale which was developed by Kerle and Bialek (1958). The results from the two scales indicated that members in both groups had reduction in subjective stress levels. This study did not show that biofeedback contributed to the reduction more than the lecture-discussion format.

The research arena continued to broaden. Kappes and Morris (1982) studied 59 psychiatric patients and 57 hospital employees for 20 minute skin temperature variation. The results indicated that the patients had higher temperatures when compared with employees. These researchers believe that the results may have been due to patient medication. These researchers then analyzed the results based on racial subgroups (white, black and eskimo) where an overall difference in skin temperature variation was found. Unfortunately, they were unable to attribute these differences to anything they had done in that investigation.

The question of the effectiveness of biofeedback was clearly the major concern of those practitioners who were comfortable using more traditional techniques for treating stress-related disorders. Silver and Blanchard (1978) completed a review of studies that used biofeedback in comparison to other traditional forms of relaxation techniques used for treating psychophysiological disorders. The conclusion was that no consistent advantage was found using one form of treatment over another. However, biofeedback appeared to be a promising treatment modality for disorders such as Raynaud's Disease, sinus headaches, tachycardia, peptic ulcers, and fecal incontinence.

Shellenberger et al. (1986) examined the effect of a 10 week biofeedback and stress management course for improving physical and mental health. The research design called for two groups. Group one received biofeedback and traditional stress management training and group two received no treatment. The group that was treated with biofeedback and the stress management training did show a greater reduction in doctors visits in relationship to the subjects in group two.

Hickling, Sison and Vanderploeg (1986) conducted a study using biofeedback and relaxation techniques to treat veterans who were suffering from post-traumatic stress disorder. They trained 6 subjects for a period of 8 to 14 sessions. The 6 week treatment phase consisted of biofeedback, individual therapy, and group therapy. Measures used to assess treatment outcome included scores from pre-test and post-test Minnesota Multiphasic Personality Inventory, The State-Trait Anxiety Inventory, Becks Depression Inventory and the Multidimensional Health Locus of Control. Examination of the results suggested that the use of relaxation and biofeedback are effective treatment components when used together.

The research studies that were reviewed ranged from general investigations to very specific. Lustman and Sowa (1983) compared the effectiveness of electromyography (EMG), which is a biofeedback procedure, with stress inoculation. Stress inoculation is a cognitive-behavior therapy technique. They compared these two treatment modalities against themselves and against a control group. The findings indicated that the biofeedback and stress inoculation groups improved significantly more than the control group, but no major difference was found between each of the treatments.

Carroll and Evans (1981) conducted a study which provided support for the idea that biofeedback could also be used as a preventive treatment procedure. They exposed three groups of ten subjects to intermittent bursts of loud noise. Two of the groups attempted bidirectional cardiac control just prior to receiving their loud burst of noise. One of these groups was able to utilize biofeedback heart monitoring and the other was not. The third group did not attempt the heart rate control, but instead received false feedback that their heart rates were either increasing or decreasing. This information was given to the subject just prior to the burst of loud noise. The results indicated that subjects who were able to monitor their heart rates found the loud burst of noise less aversive than subjects who were not.

The question of the effectiveness of biofeedback became a secondary issue as the number of comparative studies increased. Some of the studies presented conclusive results that biofeedback-assisted relaxation treatment was effective, while other studies were unable to provide support in either direction. The question that became important as biofeedback treatment and its technology became more popular was, is biofeedback cost-effective?

Schneider (1987) conducted a comprehensive review of the literature that supports the cost-effectiveness of biofeedback-assisted relaxation training. Schneider cited the report of Fahrion, Norris, Green, Green, and Schnar (1987) on the Menninger hypertension program. This program was a multimodal biobehavioral treatment program that included biofeedback-assisted training techniques. The goal was to teach self-regulation of vasodilation in both the hands and the feet. The results indicate that of the 54 medicated patients, 58% were able to simultaneously eliminate the use of hypertension medication completely and decrease blood pressure an average of 15/10mm hg. Schneider suggested that assuming a group treatment cost of \$600 per patient, and an average five year medication cost of \$1,338 per individual, there would be at least an annual medication savings of \$738.00. The question of cost-effectiveness in most of the cases cited by Schneider clearly was in the favor of both the patient and the insurance organization. Schneider's research indicates that biofeedback creates a win-win situation for both the patient and the corporation.

Biofeedback is now one of the most popular adjunctive treatment procedures for dealing with stress-related disorders. The naive mistake that is often made at the front end of a new treatment discovery is that the treatment will work for everyone. Because of the lack of empirical data to support the notion that biofeedback is an effective treatment procedure with African-Americans, this researcher is concerned that clinicians not find themselves having provided inappropriate treatment for a group of patients.

### Stress and the African-American Employee

Today's African-American employees are the beneficiaries of great historical achievements. This achievement has placed them in large corporations with as much



responsibility, if not more responsibility in some cases, as their white counterparts (America & Anderson, 1979). The consequences of this new responsibility have led to critical levels of stress. Greene (1985) and Howard and Hammond (1985) report that African-American employees in general and more specifically those in supervisory positions face a variety of stress-producing agents that their white counterparts may not experience. One example is the basic difference that exists in cultural communication. Cultural differences often result in false interpretation of both verbal and non-verbal messages between the majority group and the minority group (Rothwell & Costigan, 1975). Casual observations suggest that when this misinterpretation occurs, it is the African-American employee who must justify what may be considered normal assertive behavior. Other areas that were reported to cause African-American employees stress that are less likely to be experienced by their white counterparts are professional dissatisfaction, family conflict, and economic instability ("Stress on the Job," 1990).

African-Americans that work in middle management or aspire to become middle managers are also faced with the stress of learning the informal norms of the company. These norms are behaviors that are said to create company cohesiveness, but for the African-American employee they create isolation and alienation (Greene, 1985). The higher one's aspirations, the more rigid these rules become. White employees are also affected by these informal corporate norms as well as is the African-American employee. The problem is that these norms are built on white behavior standards and often serve to reinforce still more differences between African-Americans employees and white employees (Jones, 1973). These standards are often difficult for African-American employees to adjust to. Only the most persistent African-American employees will survive the constant struggle to adjust to these

informal rules. Some African-American employees refuse to force themselves to fit these norms, and their career growth generally slows down or stops completely (Howard & Hammond, 1985; Jones, 1973). Even African-American employees who do adjust to playing the game often become frustrated because they are not rewarded with timely promotions. Jones (1973) and America and Anderson (1979) were concerned with companies' lack of sensitivity in dealing effectively with these informal issues and the resulting stress. These writers report that the stress for African-American employees comes primarily from the frustration of being trapped in a no-win situation.

Greene (1985) highlighted how this stress affects the health of African-American employees. She reports that the number one health risk in the African-American community is cardiovascular and pulmonary disease. Greene further states that the number of African-Americans suffering from hypertension in the American work place is clearly disproportionate to that of white employees. The health problems have continued to grow over the past 15 years and have become a major concern for most of the larger American corporation. The antecedents that create the stress for the African-American employee will not quickly be resolved and it is far beyond the scope of this paper to suggest a workable solution. However, the management of the stress is a situation that corporations are starting to deal with. Major corporation are utilizing in-house psychologists who are employing biofeedback to assist with stress reduction treatment.

#### Historical View of African-Americans' Mistrust of the Mental Health System

Literature has noted the lack of the African-American community's utilization of mental health professionals and mental health systems (Greene, 1986; Jackson, 1983;

Ridley, 1986; Wetzel & Wright-Buckley, 1988). This literature suggests that African-American people are less likely to trust an outside person (African-American or white) to assist them with emotional problems that are likely to occur in their day-to-day life (Turner & Jones, 1982). This literature suggests that African-American people are even less likely to seek services or remain in treatment if the mental health provider is white (Maultsby, 1982).

In order to form some understanding for this lack of trust that African-Americans have acquired over the years for the mental health system, there must first be an understanding of the historical background of how African-Americans were viewed by some of the major white mental health professionals in this country. While these views have started to change dramatically over the past 25 years, they were in place long enough to thoroughly condition an entire culture of people.

The scope of this paper does not permit this researcher to present a lengthy discussion about the plight of African-American people prior to the Civil War; however, for the sake of orientation, the most enduring and strongly held beliefs by some white Americans prior to and shortly after the Civil War will be presented. These beliefs are discussed in a book edited by Turner and Jones (1982), which is titled Behavior Modification in Black Populations. In that work, Maultsby quoted Thomas and Sillen as saying that “black people were believed to be inferior and therefore had less mental capacity than did white people” (p. 40). Their information was taken from the 50th anniversary report of the National Conference of Christians and Jews. The second belief states that “by nurture or nature, the personality structure of blacks was hopelessly abnormal by white standards” (Thomas & Sillen as cited by Maultsby, 1982, p. 40). Much of this information was put together by healthcare professionals who often fabricated pseudoscientific evidence to validate the popular

belief that African-Americans were an inferior race of people (Freedman, Kaplan, & Sadock, 1978).

In 1904 G. Stanley Hall, founder of the American Journal of Psychology and first president of the American Psychology Association, described African-Americans as members of the adolescent race in an arrested stage of development (Hall, 1904). As recently as 1972, psychologists promulgated theories that African-Americans who presented high levels of self-esteem were merely trying to cover up that they have low self-esteem (Maultsby, 1982). With this type of information being used for training and treatment, it can be extrapolated that many African-Americans were being misinterpreted, misdiagnosed, and mistreated.

Now, pair these beliefs with the experiences of slavery and segregation and you should begin to develop a better understanding for African-Americans' mistrust of the mental health system. Even the most unprejudiced and well-intentioned white mental health professionals can pose a serious threat to the mental health of African-American patients if they believed what they were told during their training (Maultsby, 1982).

The final phase to the conditioning of an entire culture of people came when African-Americans found that the mental health system was used for discrimination. African-Americans who could not pass intelligence tests were not allowed to vote (Ebony Pictorial History, 1971). Many African-Americans found themselves incarcerated due to the misinterpretation of their behavior by white mental health professionals (Maultsby, 1982). Considering that 95% of the mental health services provided in the United States are delivered by white mental health professionals, African-Americans' distrust of the system could be considered a rational response.

It should also be noted that one of the major techniques used to assist with stress reduction is hypnosis. While this technique has enjoyed success with a wide range of

clinical problems, it has not had the same success across cultural groups (Brodsky & McNeil, 1984). These authors report that the level of patients' susceptibility to hypnosis is different across race and sex. Brodsky and McNeil (1984) reported that African-American patients tend to be less susceptible to hypnosis than white patients. However, it is difficult to make an accurate statement about why this may be true. Turner and Jones (1982) report this may be due largely to African-Americans' historical mistrust of mental health systems and its practitioners.

This research study will examine whether African-American employees respond differently to biofeedback as a treatment procedure for reducing stress. If differences are found, then recommendations will be made that will assist clinicians to increase their success in treating African-American employees.

## CHAPTER III

### DESIGN AND METHODOLOGY

#### Population

The subjects for this study consisted of approximately 40 white employees and 40 African-American employees, who are currently working at a regional company. There were 38 male employees and 42 female employees who participated in the study. These employees ranged in age from 20 to 63. The participants' job classifications encompassed four major categories: production, technical, clerical and professional. The entire study was conducted in an eight week period.

#### Selection

Employees were selected to participate in the study based on their response to a general company notice that went out to all employees (see Appendix A). Employees were not allowed to participate for any one of the following reasons: (1) they were not experiencing any stress or anxiety; (2) they were currently abusing intoxicating substances; (3) they did not have the time to devote to the study; or (4) they were experiencing a known major psychological or personality disorder that required treatment prior to taking part in this study.

#### Introductory Meeting

Employees who took part in the study attended an introductory meeting where they received an overview of the study. During this meeting, employees were asked

to sign a consent form denoting that they were aware and understood that they were part of a dissertation research study and that they were willingly participating in this eight week study (see Appendix B). These employees were also informed that some of them would be receiving biofeedback treatment, others would receive traditional stress management treatment, and still others would receive no treatment at all. It was clearly stated that anyone who did not receive biofeedback treatment during the study could receive the full treatment at the conclusion of the research.

#### Pre-test

During the introductory meeting, employees were given the State-Trait Anxiety Inventory (Spielberger et al., 1970) (see Appendix C). This served as Part 1 of the pre-test measures. Part 2 of the pre-test measures consisted of form A of the 3 minute Brief Biofeedback Stress Assessment. The brief assessment required that employees follow instructional prompts that appeared on the computer screen. The computer first prompted the employees to relax by giving them a series of relaxation suggestions. Next, the computer created a stressful situation and requested that the employees answer several questions that were taken from an intelligence test. The final phase of this brief assessment test was a recovery phase. During this phase the employees were once again prompted to relax through a series of exercises. Data were taken from four areas of the employees body: (1) heart rate, (2) pulse height, (3) finger tip temperature, and (4) one electromyograph (EMG) site, which was the frontalis (forehead).

## Sampling

Following the pre-test phase of the study which included all employees, they were randomly assigned to either the biofeedback group, the traditional group, or the control group. This was done in order to insure random distribution of employees to all three groups. These groups were not separated by age, sex, or job title, only by race. The biofeedback treatment group consisted of 14 African-American employees and 14 white employees. This group contained 7 African-American males, 7 African-American females, 7 white males and 7 white females. The traditional treatment group consisted of 13 African-American employees, and 13 white employees. The breakdown for this group was 9 African-American males, 4 African-American females, 5 white males and 8 white females. The control group was made up of 13 African-American employees and 13 white employees. This group was divided into 7 African-American males, 6 African-American females, 3 white males and 10 white females.

### Biofeedback Group

Once the pre-test measures were taken, the biofeedback group received stress management literature (see Appendix D), 3 group meetings, and five biofeedback-assisted treatment sessions (Roskies, 1987; Schandler & Dana, 1983).

The literature was distributed to the employees as homework following each of the group meetings. The group meetings were held once each week for the first 3 weeks of the study. During the first group meeting, participants were presented with the causes of stress in the work place. The second group meeting presented information about the mental and physical problems that result from unmanaged stress. The final group meeting dealt with some basic methods that can be used to manage unwanted stress.



In addition to the group meetings, participants in the biofeedback group had five biofeedback-assisted treatment sessions. During the biofeedback sessions, participants learned to lower their stress levels by using progressive muscle relaxation, mental imagery, and diaphragmatic breathing techniques (see Appendix E). The employees did this while being monitored for heart rate, pulse height, skin temperature, and muscle tension. These systems were monitored by attaching sensors to three of the employees fingers' and one to their frontalis.

Three of the biofeedback sessions involved direct individual training with this researcher. The final two biofeedback sessions were practice sessions, where the employees worked alone. Each session took approximately 50 minutes.

#### Traditional Treatment Group

The employees in the traditional treatment group received only stress management literature (see Appendix D). They assembled simultaneously with the treatment group during the 3 weekly group meetings. No other treatment was offered to this group during the course of the research study. At the conclusion of the study, employees assigned to the traditional and control treatment groups were given the option of receiving the same treatment that employees in the biofeedback group received.

#### Control Group

The employees assigned to this group received no treatment at all. These employees were given the pre-test and after 8 weeks they were administered the same post-test as the biofeedback and traditional treatment groups.

### Post-Test

At the conclusion of the treatment phase, employees from all 3 groups were given form B of the biofeedback assessment test. The final part of the post-test was the re-administration of the State-Trait Anxiety Inventory (Spielberger et al., 1970) to all the employees involved in the study.

## CHAPTER IV

### RESULTS

A total of 74 employees completed the entire stress management program. The biofeedback group consisted of 14 African-American employees and 14 white employees for a total of 28 employees. The traditional treatment group contained 13 African-American employees and 13 white employees for a total of 26 employees. The third group was the control group which was made up of 10 African-American employees and 10 white employees for a total of 20 employees. The total mortality of the study consisted of 24 of the 98 employees who initially volunteered for the study. Only the employees who completed the entire study will be included in the reported results. Even though the major concern of this study is the results of the biofeedback treatment group, the results for all groups will be reported. The average age of the employees who participated in this study was 38.8. There were 31 males and 43 females who completed this study. These employees belonged to one of 4 job classifications: 13 clerical employees, 21 production employees, 25 professional employees and 15 technical employees.

The research model that was used was a pre-test/post-test design. The subjects who completed the program were assessed on five different variables during both the pre-test and the post-test phase of the experiment. One of the variables was a two part paper/pencil instrument and the others were four biofeedback measures. The paper/pencil instrument was the State-Trait Anxiety Inventory (Spielberger et al., 1970). This instrument yielded two scores, a state anxiety measure and a trait anxiety

measure. The four biofeedback measures were taken on the employees' heart rate, body temperature, blood pulse height and muscle tension across the frontalis.

As can be seen in Tables 1 and 2, white employees in the biofeedback group showed a greater rate of improvement than did African-American employees under

Table 1  
Overall Mean Rate of Improvement for Biofeedback Conditions

Variables	White Employees	Black Employees
State Anxiety	10.43	7.29
Trait Anxiety	8.36	6.00
Heart Rate	4.00	2.50
Body Temperature	2.61	1.30
Pulse Height	0.18	0.00
Neuromuscular	3.55	2.97

Note. The above levels of improvement were calculated by subtracting the pre-test mean from the post-test mean.

Table 2  
Analysis of Covariance Results for the Biofeedback Treatment Group

Variables	White Employees		Black Employees		<i>p-Value</i>
	Mean	Std	Mean	Std	
State Anxiety	40.29	2.04	42.51	2.04	0.4503
Trait Anxiety	41.57	1.71	44.25	1.70	0.2718
Heart Rate	72.36	1.66	73.80	1.66	0.5439
Body Temperature	87.22	0.97	85.32	0.97	0.1759
Pulse Height	0.69	0.05	0.45	0.05	0.004
Neuromuscular	3.39	0.55	3.50	0.54	0.8873

the same conditions on every variable measured. Table 1 shows the mean differences between the pre-test values and the post-test values. White employees showed a trend of better improvement across the 6 dependent variables. These trends tend to support the researcher's belief that white employees show a greater rate of improvement over African-American employees when stress is treated with biofeedback techniques. Employees exposed to the traditional treatment group conditions showed no consistent pattern of improvement as can be seen in Tables 3 and 4.

Table 3

Overall Mean Rate of Improvement for Traditional Treatment Conditions		
Variables	White Employees	Black Employees
State Anxiety	5.70	3.61
Trait Anxiety	4.62	4.77
Heart Rate	0.00	1.00
Body Temperature	2.62	3.02
Pulse Height	0.10	0.14
Neuromuscular	1.18	0.17

Note. The above levels of improvement were calculated by subtracting the pre-test mean from the post-test mean.

The results of the control group, which received no treatment intervention at all indicated that on four of the six variables white employees improved more than African-American employees. On two of the variables there was no improvement by either the African-American employees or the white employees. By examining these results in Table 5, it is clear that with the exception of one variable, the differences are too small to represent statistical or clinical significance.

Table 4  
Analysis of Covariance Results for the Traditional Treatment Group

Variables	White Employees		Black Employees		<i>p-Value</i>
	Mean	Std	Mean	Std	
State Anxiety	44.43	2.10	46.84	2.10	0.4215
Trait Anxiety	46.38	1.79	45.41	1.77	0.7029
Heart Rate	76.20	1.76	77.13	1.78	0.7215
Body Temperature	87.33	1.01	86.66	1.01	0.6446
Pulse Height	0.59	0.06	0.60	0.06	0.8749
Neuromuscular	4.52	0.57	5.00	0.57	0.5551

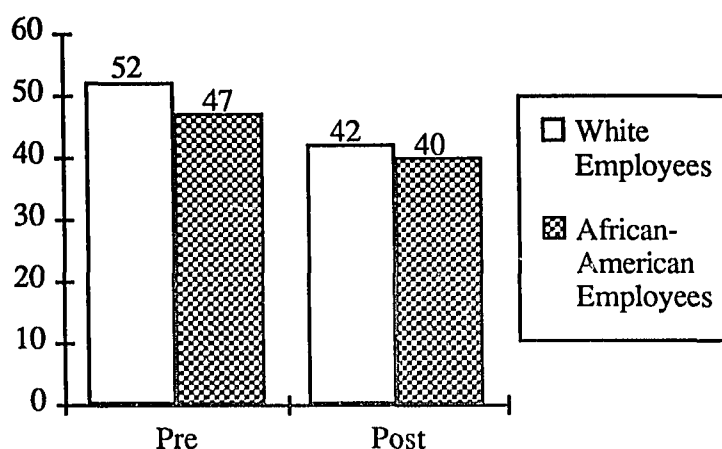
Table 5  
Overall Mean Rate of Improvement for Control Conditions

Variables	White Employees	Black Employees
State Anxiety	0.80	0.00
Trait Anxiety	1.40	0.00
Heart Rate	13.00	5.10
Body Temperature	0.00	0.00
Pulse Height	0.11	0.00
Neuromuscular	0.00	0.00

**Note.** The above levels of improvement were calculated by subtracting the pre-test mean from the post-test mean. Zero value indicates that the employee's post-test value was a negative number showing no improvement.

The first research hypothesis was that there is a difference in the way African-American employees and white employees respond to the state anxiety inventory. The results of the state anxiety inventory for the biofeedback treatment group supported

this hypothesis. White employees in the biofeedback treatment group showed a 10.43 point improvement over their original pre-test score for state anxiety while African-American employees in the same group showed only a 7.29 point improvement over their pre-test score, as can be seen in Figure 1.



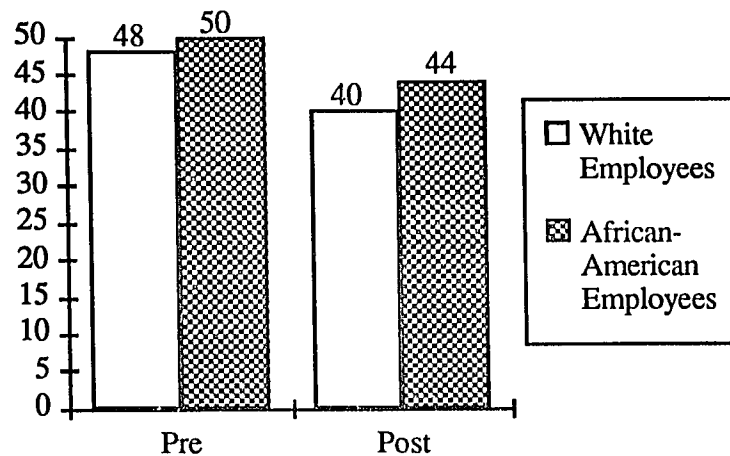
Note. Treatment goal is to reduce total overall score.

Figure 1. Results of State-Anxiety for the Treatment Group.

The second hypothesis was that there is a difference in the way African-American employees and white employees respond to the trait anxiety inventory. The results of the trait anxiety measure followed the same pattern. White employees improved 8.36 points over their pre-test score, while African-American employees improved only 6.00 points on the trait anxiety portion of this test, which is shown in Figure 2. Even employees in the control group followed the same pattern of white employees showing better post-test improvement than African-American employees under the same conditions.

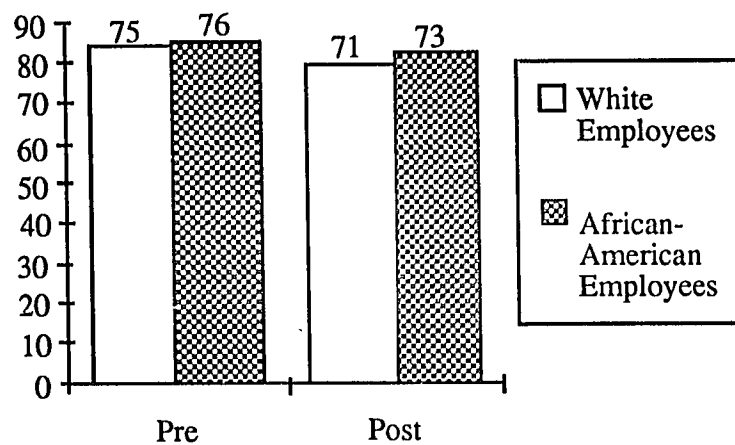
The third hypothesis was that there is a difference in the way African-American employees and white employees respond to the biofeedback measure of heart rate. The employees' goal was to decrease their heart rates in order to show improvement. Both

African-American and white employees who were exposed to the biofeedback treatment conditions showed improvement; however, white employees improved an average of 4 beats per minute and African-American employees only 3 beats per minute. This can be seen in Figure 3.



Note. Treatment goal is to reduce overall score.

Figure 2. Results of Trait-Anxiety for the Treatment Group.



Note. Good scores range from 68 to 72. Treatment goal is to lower heart rate.

Figure 3. Results of Heart Rate for the Treatment Group.

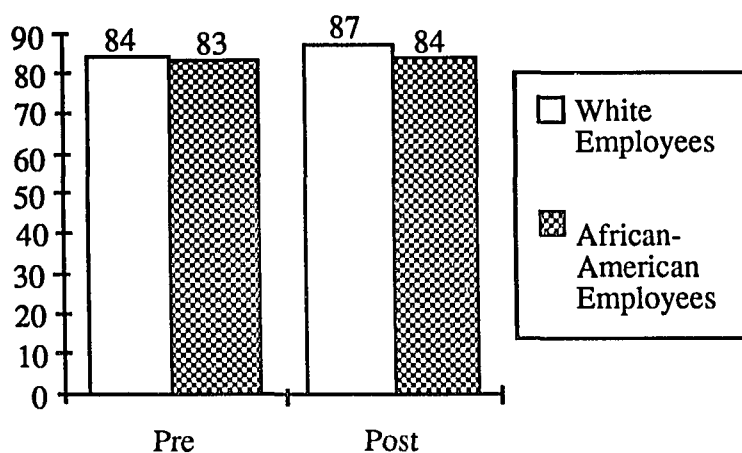


The results for the traditional treatment group on this variable showed no improvement for the white employees and only one beat improvement for the African-American employees.

The white employees in the control group showed a 13.00 beat per minute post-test improvement, while the African-American employees only improved 5.10 beats per minute. Note, that even though these employees appear to have improved more than the employees in both the biofeedback and the traditional treatment groups, they started at a much higher pre-test level. Even with the larger post-test improvement, the employees in the control group still have heart rates that are considered excessive.

While the differences for the biofeedback group are small and are not statistically significant at the 0.05 level, the results tend to support the research hypothesis that there is a difference in the way African-American employees and white employees respond to biofeedback treatment. In the case of heart rate, white employees showed a greater rate of improvement over African-American employees exposed to the same conditions.

The fourth hypothesis was that there is a difference in the way African-American employees and white employees respond to the biofeedback measure of body temperature, followed the same pattern. The differences were small and not statistically significant, but clearly went in the direction of the research hypothesis. The employees' goal on this measure was to increase their skin temperature in order to show improvement. White employees who experienced biofeedback treatment conditions increased their post-treatment temperature 2.61 degrees over their pre-treatment temperature, while African-American employees improved only 1.30 degrees, as illustrated in Figure 4.

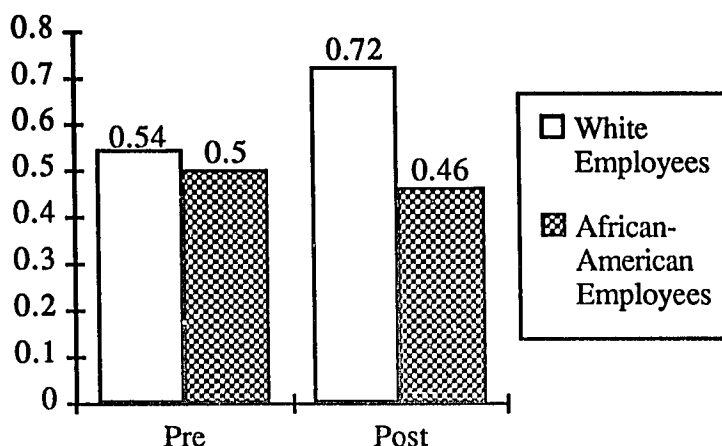


**Note.** Good scores range from 90 to 95. Treatment goal is to increase temperature.

Figure 4. Results of Body Temperature for the Treatment Group.

The results for employees in the traditional treatment group indicated that African-American employees improved slightly more than the white employees (African-American 3.02 and white 2.62). The results for employees in the control group indicate that neither the African-American employees nor the white employees improved their skin temperature during the post-test phase of the experiment.

The third biofeedback measure was blood pulse height. The fifth hypothesis was that there is a difference in the way African-American employees and white employees respond to the biofeedback measure of pulse height. This is a measure of the employee's vasoconstriction. Here, the employees attempt to increase this level in order to show improvement. On this measure, the results supported the research hypothesis. The results for the biofeedback treatment groups indicated that African-American employees showed no improvement over their pre-treatment measurement. On the other hand, white employees improved 18 points over their pre-treatment measurement. The difference found between the white employees and the African-American employees for blood pulse height was statistically significant at the 0.05 level (*p-value* of .004) (see Figure 5).



**Note.** Good scores range from 0.90 to 1.20. The treatment goal is to increase scores.

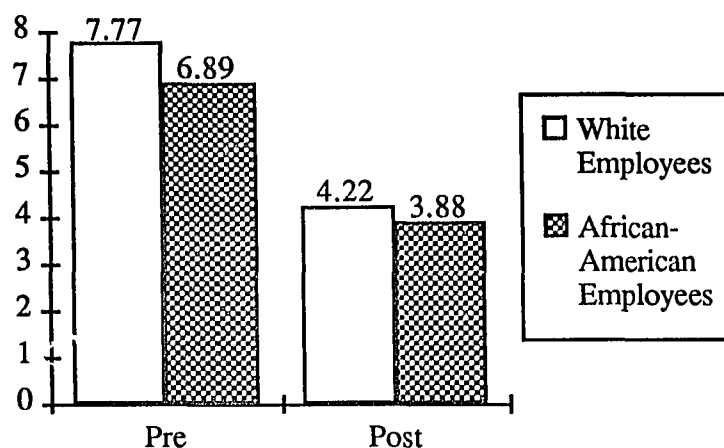
Figure 5. Results of Blood Pressure Height for the Treatment Group.

Pulse height results for the traditional treatment group demonstrated that African-American employees improved four points more than white employees; however, white employees in the control group showed 11 points of improvement while African-American employees under the same conditions showed no improvement at all.

The final biofeedback variable measured neuromuscular activity using an electromyography (EMG). The sixth hypothesis was that there is a difference in the way African-American employees and white employees respond to the biofeedback measure of neuromuscular activity. The EMG lead was attached to the employee's frontalis (forehead). The goal of the employee was to decrease the amount of muscle tension in his/her frontalis muscle. White employees showed an average rate of improvement of 3.55 microvolts while African-American employees improved 2.97 microvolts over their baseline rate (see Figure 6).

White employees exposed to the traditional treatment conditions showed a 1.18 microvolt improvement over their pre-test measure while the African-American

employees improved only 0.17 microvolts. Neither the African-American employees nor the white employees under the control group conditions showed improvement on the EMG measures.



Note. Treatment goal is to decrease muscle tension.

Figure 6. Results of Neuromuscular Activity for the Treatment Group.

The analysis of co-variance was used to calculate the statistical significance of the differences found between white employees and African-American employees in the biofeedback treatment group. This test was selected because it is the most powerful test for calculating group differences and it would not appear to be too conservative when determining these differences (Hinkle, Wiersma & Jurs, 1979). This test also accounts for scores recorded during the pre-test phase of the research. Bonferroni Confidence Intervals were calculated to determine interaction effects between the 2 groups on all the variables. This test also allows for the error rate to remain constant while simultaneous comparisons are being conducted.

As was stated earlier, the differences between the African-American employees and the white employees in the biofeedback treatment group were only found to be significant in only one of the six research variables (pulse height).

The results of the study do move in the direction of the research hypothesis that there is a difference in the way African-American employees and white employees respond to biofeedback treatment. The differences were not all found to be statistically significant, but they do tend to show a trend that clinicians should consider.

Based on the outcome of this study, emphasis must be placed on the trends that are seen in the results. These trends suggest that the results have some meaning for treatment, the population, and the environment in which it is applied. Statistical significance implies that the measured relationship between variables has an arbitrarily low probability of occurring by chance. When analyzing trends, the researcher looked at what the data mean in the real world setting.

Because this study showed differences insignificant to support statistical significance, the discussion chapter will focus on trends and probe how statistical significance might be increased in replications of this study.

## CHAPTER V

### DISCUSSION AND RECOMMENDATION

The impetus for conducting this study was to determine whether there is a difference in the way African-American employees and white employees respond to biofeedback as a treatment modality for reducing stress. Second, this study should serve as a springboard for increasing the quantity of empirical data on minority subjects in general and African-American subjects in particular on biofeedback-related research studies.

The results of this study suggest that there are trends in the way that African-American employees and white employees respond to biofeedback. However, the differences that were discovered during this study were not sufficient to support a statement of significance, with the exception of one of the six variables which will be discussed later in this chapter.

The white employees in the biofeedback treatment group showed a greater rate of improvement than the African-American employees on every variable. While the two groups showed a trend of responding differently, the differences were not large enough to support a statement of statistical significance. However, these differences do represent trends for consideration by both clinicians and researchers.

This researcher believed that differences would be found in the way these two groups responded to biofeedback treatment. More accurately, it was believed that African-American employees would respond less favorably than white employees to biofeedback-assisted treatment procedures for reducing stress. This chapter will present theoretical explanations to support the importance of the differences that were

found and why they were not large enough to support a statement of significance. This chapter will also discuss limitations of the study and present recommendations for further empirical investigation.

Three critical areas will be examined to explain the trends that were found between these two groups, as well as why the differences that were found were so small. The first critical area that will be looked at is the historically different cultural experiences of these two groups and how they relate to psychotherapy. The second critical area will be the effect the researcher had on the employees involved in the study. Finally the research methodology will be explored to account for the smallness of the differences that were found.

#### African-Americans and Psychotherapy

Studies have validated African-Americans' mistrust of white mental health professionals by comparing African-Americans' level of disclosure when they are paired with white therapists. Wetzel and Wright-Buckley (1988) report that African-Americans are more likely to self-disclose when paired with African-American therapists and whites are more likely to self-disclose when paired with white therapists. They conclude that the breakdown in self-disclosure may be due to the African-American perception that white mental health professionals are not trustworthy. Ridley (1986) and Williams, Wolkon and Moriwaki (1973) conducted similar studies that examined the effects that low self-disclosure has on misdiagnosis of African-American patients. These researchers were concerned that low levels of self-disclosure can be viewed as an index of one's good mental health, depending on the situation. If this statement is true, and, if African-Americans mistrust white therapists, then, logically, they are less likely to self-disclose to them. The end result

would be that African-American patients would be perceived by white therapists to have poor mental health, and, therefore, are more likely to receive more severe diagnoses. Maultsby (1982) suggests that this mistrust that African-Americans have of white mental health professionals is totally warranted and, considering history, could be viewed as a very healthy response.

Based on this information it can be understood that African-American patients are more likely to respond more openly with African-American therapists and white patients with white therapists. This issue becomes very important when attempting to conduct research or treatment using African-American subjects or white subjects. This information must be considered when attempting to understand the results of this study.

### The Effect of Therapeutic Relationship

This researcher believes the relationship between patients and therapists is critical to the success or failure of any clinical relationship, in general, and in biofeedback treatment, in particular. It is very important to examine the treatment relationship between the researcher and the employees involved in this study. Some biofeedback researchers believe that the relationship between the therapist and the patient serves no therapeutic importance when interpreting the results of biofeedback treatment outcomes or research data; however, the majority of the literature supports the clinical relationship as being critical in any therapeutic interaction (Gaarder & Montgomery, 1977).

Gaarder and Montgomery (1977), in their manual on clinical biofeedback, supported this issue. They state that often when treatment is not successful the failure can be traced to a conflictual therapeutic relationship. Schneider and Wilson (1985)



wrote a book entitled Foundations of Biofeedback Practice. They also support the importance of the patient/therapist relationship. They report four theories that often can be used to explain such relationship conflicts and how they interfere with treatment success. For the purpose of this paper, only two of these theories will be used to assist in understanding the results of this study. The two theories that relate to this study are negative transference and positive transference.

Negative transference occurs when the patient views the therapist as demanding, unsympathetic, critical, uncaring, selfish, untrustworthy, and unable to relate to his/her personal experiences (Schneider & Wilson, 1985). When the therapist does not present this type of demeanor toward the patient, and the patient perceives that he/she is, then negative transference is occurring. When negative transference is occurring, the patient may respond by being uncooperative, oppositional, guarded and suspicious. This damages the patient/therapist relationship and reduces the level of therapeutic productivity.

Positive transference occurs when positive feelings on the part of the patient are projected onto the therapist. This will occur when the patient has a positive past experience with a person of the same race or gender as the therapist. If the therapist is viewed as a positive source of reinforcement (understanding, loving, safe, trustworthy), the patient may well perform at a much higher rate of behavior than would be expected under different conditions. This might set up a false sense of treatment success.

When examining what appears to be a trend in the way African-American and white employees respond to a biofeedback program, the issue of treatment relationship becomes important in understanding the trend. If we can believe that the literature is accurate in what it states about the importance of therapeutic relationships with respect

to clinical intervention, then the theories of negative and positive transference become an appropriate explanation for the trends that were found and the absence of statistical significance.

This researcher expected that white employees would respond significantly better than African-American employees under the same treatment conditions. The results do not statistically support this hypothesis. The main hypothesis for this study was merely that there would be a difference between these two groups.

The trend in the results suggests that white employees responded better than African-American employees on every variable (state and trait anxiety, heart rate, skin temperature, blood pulse height and EMG muscle activity). Unfortunately, the differences that were found were not large enough to support a statement of statistical significance. The one exception was the blood pulse height variable where a significant difference was found.

The question that concerns this researcher is why these differences were not as dramatic as predicted. One possible explanation is that there really is no difference in the way African-American and white employees respond to biofeedback treatment. The differences that were found could be chance differences based completely on random error; therefore, it would be expected that African-American employees and white employees would always respond about the same.

The second explanation would be that the researcher influenced the way both African-American employees and white employees responded. The researcher for this study was a young, African-American male. The white employees who were predicted to respond significantly better than the African-American employees performed slightly lower than was expected. It is believed that the researcher's presence affected the way this predominantly white female group performed. The

white employees presented as if they were uncomfortable during the individual training session. They often found it very difficult to let go and relax. The term “let go and relax” can be operationally defined as being able to close one’s eyes and allow them to remain closed during the session. Sitting still in the chair without continuous movement or checking the clothes to make sure nothing was exposed is another operational index of letting go and relaxing. Allowing one’s body to recline completely in the chair also indicates letting go and relaxing. This was observed during individual training sessions when the employees worked in the room alone with the researcher. Several of the females in the white employee group found it difficult to recline and relax fully in the chair unless they were working alone during one of the practice sessions. The most obvious indication that these females were uncomfortable could be seen when this researcher requested that their eyes be closed. Some of the employees in this group had to be prompted several times before they complied. Others would comply almost immediately, but as they found themselves starting to let go, they would open their eyes, locate the therapist, adjust their clothes, and then attempt to relax again. This would cause the employee to have to start the relaxation process over.

The concept of negative transference could help explain the white employees’ behavior. There appeared to be an element of mistrust on the part of the white employees of the African-American researcher. The white employees were not trusting, and, therefore, were unable to let go of their anxious, guarded behavior. The result of this behavior could explain this groups’ unpredictably low responsiveness to the overall training program.

Conversely, the African-American employees responded considerably more favorably than was expected. The rationalization for their behavior can be explained

by the theory of positive transference. The African-American employees clearly viewed the researcher as a positive source of reinforcement. They presented as less anxious during the entire study and were able to let go and relax during the individual training sessions. The African-American employees were more verbal during their sessions. They were more likely to ask personal questions of the researcher, generally regarding some element of blackness. It is believed that this was a testing period to determine the genuineness of this therapist's African-American experience. They willingly disclosed more details about their personal stressors than did the white employees. The African-American employees were less likely to question the training procedures or what the equipment would be doing to them. The members of the white treatment group appeared more inquisitive about the equipment and less trusting of what the researcher was doing to them. Members of the white treatment group were more likely to question the researcher's level of training, treatment experience, and overall knowledge of biofeedback principles.

The presence of the African-American researcher represented a symbol of security to the members of the African-American treatment group, while the presence of this same researcher created suspiciousness on the part of the white employees. It is the belief of this researcher that his presence raised the level of trust for the African-American employees who were involved in a research study at a predominantly white corporation. With a higher level of trust, the African-American employees were able to respond more favorably than was expected, therefore, presenting a false level of treatment success.

If what has been presented about the importance of the therapeutic relationship is true, then both the African-American employees and the white employees have responded inconsistently with what was predicted. The white employees responded

uncharacteristically lower than would be expected had the researcher been white. In addition, the African-American employees responded better with an African-American researcher than would be expected had the researcher been white.

### Limitations of the Study

When considering limitations of this study, the area that deserves first consideration is the research methodology. In this type of study, the design of the study could change the results in either a positive or a negative direction. Because biofeedback is new as a treatment approach, there continues to be some uncertainty about the best methods of delivering services.

Given the fact that the number of employees who completed the study in each group was small, this could have affected the results. Had there been more employees in each group, more data would have been generated.

Another methodological consideration would be the duration of the study. The employees in the treatment group received eight training sessions. The possibility of a longer treatment phase could have varied the results of this study. Literature from the Menninger Foundation suggests that instead of focusing on the number of sessions that a patient should complete, the researcher should focus on mastery of a particular skill (Green & Green, 1975). For example, giving an employee a specific heart rate to achieve rather than a specific number of sessions to complete. The researcher will then measure the length of time it takes a patient to achieve mastery.

### Recommendation

This study should serve as a springboard for conducting empirical biofeedback research on African-American subjects. Such research should concern not only those

currently working in the field of biofeedback and clinical treatment but also professionals involved in training new psychologists. Our understanding of how to provide quality treatment for minority populations, in general, and the African-American population, in particular, has only come with increased empirical investigation. In order to avoid training errors such as those stated earlier, continued investigation of African-American people and their response to biofeedback must persist.

The results of this study suggest that the question of how African-American employees and white employees respond to the same-race therapists or different-race therapists is unanswered. In order to properly address these questions, a series of investigations would need to be conducted.

The first study might be to conduct parallel treatment programs using two therapists of different races. This study would require the researcher to vary the race of the therapist for each group. The study would require four groups: two groups of African-American subjects consisting of one group with a white therapist and the other with an African-American therapist. The same would be done for two groups of white subjects. By varying the race of the therapist, the question of how these two groups would respond to a therapist of the same race as well as a therapist of a different race could be more accurately addressed.

A second study might involve an investigation of the way these groups would respond to a therapist of the same sex and of a different sex. This researcher strongly believes that the sex of the therapist affected the results of this study.

A third study would be for the researcher to look at the effects of both sex and race simultaneously. Studies of this type would provide data that would allow clinicians to set up the optimum treatment environments.

Specific attention must be given to the following recommendation when considering the trends that emerged from this study. The most important trend is that white employees did respond better than African-American employees on every variable. Because of this, clinicians and researchers should:

1. Consider African-Americans' lack of experience with computerized biofeedback equipment before exposing them to the equipment in treatment. Therapists should consider a complete orientation program for all patients in general and African-American patients in particular.
2. Consider additional training for therapists (African-American and white) who plan to administer biofeedback treatment to African-American patients.
3. Consider the same sex or race therapist conducting biofeedback session where a hypnotic induction process is used.

Based on the information that has been generated during this research study, the question of whether there is a true difference in the way African-American subjects and white subjects respond to biofeedback remains unclear, if statistical significance is the only acceptable index. This researcher continues to believe that there is a difference in the way these two groups respond to biofeedback. In addition, it appears that in order to evaluate the response pattern of these two groups to biofeedback treatment, it is important to strongly consider the significance of the therapeutic relationship. The very nature of relaxation training is for the patient to be comfortable with the setting and the trainer in order to get full benefit from the treatment process. This means that, for optimal treatment success, therapists need to pay close attention to what makes their patients comfortable. Until researchers have answered the question of patient comfort, therapists need to continue to address each patient's needs separately.

**Appendix A**  
**General Company Notice**



## *Do You Want to Manage Your Stress?*

	<u>YES</u>	<u>NO</u>
★ Job pressures got you down?	<input type="checkbox"/>	<input type="checkbox"/>
★ Are you having trouble coping with the pressures of deadlines?	<input type="checkbox"/>	<input type="checkbox"/>
★ As pressure goes up, do you experience backaches, headaches, neck pain or difficulty sleeping?	<input type="checkbox"/>	<input type="checkbox"/>
★ Do you have trouble concentrating?	<input type="checkbox"/>	<input type="checkbox"/>
★ Do you find yourself feeling just plain old jittery?	<input type="checkbox"/>	<input type="checkbox"/>

If you answered yes to one or more of these questions, then you need to learn how to manage your stress level.

Occupational Health & Safety is looking for 60 employees who would like to take part in a **STRESS MANAGEMENT RESEARCH STUDY**.

- Learn the skills of becoming more aware of your physical tension.
- Learn the skills that will increase your resistance to stress.
- Learn how to understand the thoughts that cause you to feel stressed.
- Learn to manage your behavior.

**INTERESTED EMPLOYEES SHOULD CONTACT OCCUPATIONAL HEALTH AND SAFETY TO SIGN-UP FOR THIS INFORMATIVE AND USEFUL TRAINING EXPERIENCE.**

L. Irely

**Appendix B**  
**Consent Form**

## CONSENT FORM

\_\_\_\_\_  
 Kalamazoo, MI 49001

Company

Dear Employee:

My name is Ollie Barnes, I am a Doctoral candidate at Western Michigan University and a staff psychologist in the Occupational Health and Safety department. Recently, our department invested in one of the latest techniques for treating stress, biofeedback. This sophisticated equipment is designed to monitor the employee's internal body systems, such as heart rate, blood pressure, temperature and muscle tension. These are the systems that are generally effected when our bodies become stressed.

As part of my doctoral research project, I have structured a training program that is designed to teach employees how to use this equipment to monitor their own stress level. I believe that the employee who is trained and practices these techniques will better be able to manage stress during the day. Because each employee is somewhat different, the results of the program are not guaranteed; therefore, I will be looking at basic differences between Black and white employees. By understanding the differences in how these employees respond to biofeedback, we will be able to make the needed adjustments in each person's program, so the effectiveness of our stress management treatment will increase. The results will also be analyzed across age, sex and job classification.

In this study, some people will receive biofeedback, deep muscle relaxation, and some assertiveness training. Others will receive basic lecture style stress management and some may not be selected for the study due to the random nature of the selection process. However, at the conclusion of the study persons not selected for the treatment group will be allowed to receive biofeedback treatment if they so desire. Should any employee require more assistance than what is offered by the study, they will be referred for additional clinical services.

There are no clearly noted risks associated with the procedure that will be used in this program.

**BASED ON THE ABOVE AND ON THE PRESENTATION, I UNDERSTAND THE NATURE AND PURPOSE OF THE STRESS MANAGEMENT STUDY. I ALSO UNDERSTAND THAT THE DATA FROM THIS STUDY WILL BE KEPT COMPLETELY CONFIDENTIAL BETWEEN MYSELF AND THE MEMBERS OF THE RESEARCH TEAM. I ALSO UNDERSTAND THAT MY PARTICIPATION IN THIS STUDY IS COMPLETED VOLUNTARILY AND THAT I MAY WITHDRAW AT ANY TIME.**

EMPLOYEE		DATE	
RESEARCHER		DATE	

**Appendix C**  
**Self-Evaluation Questionnaire**

# SELF-EVALUATION QUESTIONNAIRE

## STAI Form Y-1

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

NOT AT ALL  
SOMEWHAT  
MODERATELY SO  
VERY MUCH SO

- |                            |   |   |   |   |
|----------------------------|---|---|---|---|
| 1. I feel calm . . . . .   | ① | ② | ③ | ④ |
| 2. I feel secure . . . . . | ① | ② | ③ | ④ |
| 3. I am tense . . . . .    | ① | ② | ③ | ④ |



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Developed by Charles D. Spielberger  
with assistance from  
H. L. Garfield, M. L. Hershowitz, P. R. Vagg, and G. A. Jacobs  
STAI Form Y-1

# SELF-EVALUATION QUESTIONNAIRE

## STAI Form Y-2

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

ALMOST NEVER  
SOMETIMES  
ALMOST ALWAYS  
OFTEN

- |  |   |   |   |   |
|--|---|---|---|---|
| 1. I feel pleasant . . . . .             | ① | ② | ③ | ④ |
| 2. I feel nervous and restless . . . . . | ① | ② | ③ | ④ |
| 3. I feel satisfied with myself. . . . . | ① | ② | ③ | ④ |

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**Appendix D**  
**Homework Literature**

# A WORD ABOUT STRESS STRESS STRESS STRESS

**S**tress is becoming a major health issue. Defined as the nonspecific response of the body to a demand, stress is especially present in the work environment. A first and important step in coping with it is learning to identify those moments and situations that trigger stress response patterns. Mental or emotional signals are often confusing or difficult to pinpoint. Thus, it is better to be aware of physical signs from one's own body.

Stress related to work has three major sources: anxiety over joblessness, anxiety over work accidents or illnesses, and anxiety over work roles. Researchers have determined that prolonged stress can cause physical symptoms as varied as headaches, allergies, hypertension, heart attacks, arthritis, and depression.

The human body is conditioned to respond to stress, first, with alarm; then, resistance by way of a chemical rallying of the body's defenses. As the body responds to a stressful event adrenaline is poured into the bloodstream, preparing us to deal with danger. It is this response that can either save our lives in a truly dangerous situation or threaten our lives if prolonged. The repeated response to stress is itself a danger.

#### Warning Signs

The following are more obvious indications that a stress response is occurring (these symptoms may indicate other conditions as well as or instead of stress):

1. General irritability, hyperexcita-

*Malcy W. Jensen (doctoral studies at California Graduate Institute) has done research on stress, particularly seeking a relationship between personality type and absenteeism in high-stress occupations.*

BY MALCYE W. JENSEN

tion, or depression, associated with unusual aggressiveness or passive indolence, depending on the personality type.

2. Pounding of the heart and indicators of high blood pressure.
3. Dryness of the throat and mouth.

**Watch for stressful times, and take good measures to handle them.**

4. A powerful urge to cry or to run and hide.
5. Feelings of unreality, weakness, or dizziness.
6. Predilection that becomes fatigue.
7. Floating anxiety—a sense of being afraid without a specific cause.
8. Emotional tension and alertness; feeling keyed up.
9. A tendency to be easily startled by small sounds.
10. High-pitched, nervous laughter.
11. Stuttering and other speech difficulties.
12. A frequent need to urinate; chronic diarrhea; indigestion; queasiness in the stomach, and sometimes vomiting.

#### Coping With Stress

1. Use your feelings about an experience as an intuitive guide. If what you are doing does not feel alive, fulfilling, or supportive, perhaps you should not be doing it.
2. Enhance your sense of choice. Create the mind-set that your involvements and activities result from conscious choosing rather than unexamined compliance or habit.
3. Involve yourself in some form of daily timeout nonstress experiences such as meditation, "warming your hands," non-competitive physical activity, or listening to peaceful music.
4. Live more of your life in the present. Focus your awareness on what is happening now rather than what did happen or what will happen. Try letting go of guilt, worry, or uptightness.
5. Restructure your approach to daily activities and problems so that you are coping with only one task or demand at a time.
6. Examine your relationship to time. Do you never seem to have enough? Are you always pushed? Are you often late?
7. Work with others (family, colleagues) to examine and reduce the demands that you face in stressful situations.
8. Investigate the degree to which you take responsibility for the happenings around you. Many of us assume much more than we need to. Overactivity is not fulfilling.
9. Examine the experiences that tend to be related to distress.
10. Control exposure to change and new experiences. Too many changes are highly stressful. □

20 MESSAGE



## STRESS ON THE JOB

Listed here are just a few ways to combat work-related bouts with stress.

1. **Identify the source of stress**, be it the boss, a co-worker a looming deadline or whatever. Confront the problem head-on, and accept the fact if the particular situation is out of your control, and can't be changed.
2. **Analyze it.** Consider the worst thing that could happen given the situation, and then weigh how likely it is to actually occur. Things are almost never as bad as they seem. and, in cases of occupational stress, the worst-case scenario almost never arises.
3. **"Clean up" your diet.** Don't react to stressful situations by overindulging in coffee, cigarettes or sodas on your break time, as they contain latent stimulants whose effects on your work performance could potentially complicate matters more.
4. **Relax both your body and your mind.** Loosen your tie, find a quiet office with few distractions (the restroom, perhaps) and meditate or perform breathing exercises to ease the muscle tension. Practice closing your eyes, and then, starting at ten, slowly count down to zero.
5. **Wear loose clothing.** If your dress code allows, consider wearing more loose fitting attire while at the office. This obviously makes it more comfortable for you, but also improves your circulation and sometimes makes you feel more secure and in command of things, even if you aren't.
6. **Begin to delegate.** Don't allow other people's priority projects to unfairly become yours. But, be careful not to delegate things that you should handle personally.
7. **Prepare a "To Do" list**, and prioritize your duties. This gives you a sense of momentum and accomplishment at the end of the day that is difficult to duplicate.
8. **Learn to say "no"**, whether to un-scheduled appointments, unannounced visitors, or to responsibilities that are easily handled by someone else. It's one of the best things you can learn to do for yourself.
9. **Call a special friend and unwind.** Everyone needs a little release or escape from the monotony of the business day sometimes. So when you can, take it.
10. **Take a short walk.** Use your break for something other than idle chitchat or discussion of the company's business. See if you can fit in a trip around the block or even a short work-out.

Remember, quick fixes, such as backache medicines, headache remedies or a masseuse, may prove effective for the short term, but the smart money should be spent getting to the root causes of stress, and doing something about it. It certainly can reduce the pressure. It just might save your life.

# HOW TO MANAGE STRESS

CHARLES ZASTROW

Stress has been called our number one emotional and physical health problem. This article presents material on conceptualizing stress, and describes a number of stress management strategies.

Dr. Charles Zastrow is a Professor in the Social Welfare Department at the University of Wisconsin-Whitewater, USA.

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## *Importance of Managing Stress*

There are a number of reasons why it is crucial that social workers and other helping professionals learn how to manage stress in themselves, and learn how to help clients manage stress:

1. Stress is a contributing factor in causing most diseases (Pelletier, 1977). These illnesses include heart attacks, hypertension, angina, arrhythmia, migraine headaches, tension headaches, ulcers, colitis, constipation, diarrhea, diabetes, infection, allergies, flu, colds, cancer, arthritis, backaches, hay fever, enuresis, hyperthyroidism, insomnia, sexual dysfunctions, dermatitis, emphysema, bronchitis, Raynaud's disease, and alcoholism (McQuade and Aikman, 1974). Stress related disorders have now become our number one health problem (McQuade and Aikman, 1974).

2. Stress is a contributing factor in causing numerous emotional and behavioral difficulties, including depression, anxiety, temper tantrums, suicide attempts, child abuse, spouse abuse, physical assaults, destructive expressions of anger, feelings of inadequacy or failure, feelings of bitterness and resentment, irritability, impatience, and stuttering (Greenberg, 1980:39-49).

3. People who are successful in managing stress have a life expectancy which is several years longer than those who consistently experience high levels of stress (Pelletier, 1988).

4. Becoming skillful in reducing stress (that is, learning how to relax) has now become widely

recognized as an effective way to facilitate the recovery from both physiological and emotional disorders (Tubesing, 1981). The therapeutic value of learning how to relax has been dramatically demonstrated by Simonton and Simonton (1975) who have had success in treating terminal cancer patients by instructing them on how to reduce stress. The recognition of the importance of stress management in recent years is gradually, but radically, altering the traditional physician-patient relationship as it urges patients to become active (instead of passive) participants in the healing process (Brown, 1977).

5. On a positive perspective, effective stress management is a major factor in enabling people to live fulfilling, gratifying, healthy, and productive lives.

## *Understanding Stress*

Stress can be defined as the emotional and physiological reactions to stressors. A stressor is a situation, demand, or circumstance which disrupts a person's equilibrium and initiates the stress response. There are an infinite number of possible stressors: noise, crowding, loss of a job, death of a friend, heat, cold, pollutants, lack of purpose in life, toxic substances, value conflicts, arguments, etc.

Every second we are alive our bodies are reacting to various demands that call for adjustment or adaptation. Our bodily reactions are continually striving for equilibrium or "homeostasis".

# Managing Work Stress

ALAN J. DUBINSKY

*Stress is pandemic—and too much of it can have adverse psychological and physiological effects. There are a number of approaches employers may take to help employees reduce stress.*

**I**tem: Richard A., a buyer for a major department store chain, was summoned to his boss's office. The meeting was not pleasant. Richard had procured a line of men's clothing and accessories that was not selling. "I don't understand how a man with your experience could have done this," his boss barked. "This line is completely unacceptable! No one's buying it! In fact, I have never seen a buyer make such a major error." His parting comment to Richard was, "Don't ever let this happen again!" As Richard left the office, he felt anxious and demoralized.

**Item:** Mary L. had been a successful salesperson for a large computer vendor for four years. She had easily surpassed management's expectations by exceeding all performance goals each year. Mary and four other salespeople were being considered for promotion to district sales manager. The day the decision was to be announced, Mary's superior called her into his office.

*Dr. Dubinsky is Visiting Associate Professor of Marketing in the School of Management at the University of Minnesota in Minneapolis.*

Her stomach felt queasy, her pulse quickened, and her palms became cold and sweaty. As she entered her boss's office, he held out his hand and said "Congratulations, Mary! You're our new district sales manager." Mary was euphoric.

Although their situations are in sharp contrast, Richard and Mary are both experiencing stress. Stress is "an adaptive response, mediated by individual characteristics and/or psychological processes, that is a consequence of any external action, situation, or event that places special physical and/or psychological demands upon a person."<sup>1</sup> The physical process involves a stressor (an event or condition that causes the psychological or physical reaction in an individual) and a stress reaction (the response to the stressor).<sup>2</sup> Richard is under stress because he has been rebuked; his reaction to the stress is emotional decay. Mary is under stress because of her anticipation of the announcement and her subsequent promotion; her response to the stress is both physical (sweating palms) and psychological (euphoria).

Both "positive" events (such as marriage, birth of a child, a promotion) or "negative" events (such as

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divorce, death of a spouse, job termination) can induce stress.<sup>2</sup> To the extent that an individual must make substantial adjustments to his or her life, stress can have debilitating psychological and physiological consequences. Also, stress can be "energizing" or "destructive."<sup>3</sup> That is, a certain level of stress is needed for people to be productive; beyond a certain threshold, however, stress impairs performance.

No employee is immune to stress. Stress is pandemic—it occurs in every job and at every level in an organization. Too much stress may result in an employee experiencing anxiety, frustration, despair, or depression; suffering from ulcers or severe migraine headaches; having an increased tendency for heart disease or nervous disorders; performing poorly on the job; or leaving the firm. Because stress has such potentially adverse consequences, employers should take steps to help their personnel manage stress. This article discusses factors that may contribute to the degree of individual stress and proposes ways to help employees manage this problem.

### Contributors to Stress

Stress has many causes. In general, however, its origins can be classified into three categories: personal factors, social factors, and organizational factors.

**Personal Factors:** Certain employees are more vulnerable to stress than others because of their age, changes or events in their lives, psychological composition, and personality. As individuals age, susceptibility to stress ebbs and flows. For example, one study of working males has identified distinct stages of life.<sup>4</sup> After passing through childhood and adolescence, a man enters the adult world and in his twenties makes an initial commitment to a career. At age 30 he may question his selection of an occupation and change jobs. Between ages 30 and 35, the individual makes a definite commitment to a job and seeks stability. From the middle to late thirties, he is not satisfied with being merely a "rising success" but desires autonomy and the opportunity to make decisions. A "mid-life transition period" may develop at ages 40 to 45, when signs of strong approval from management are needed, and even these may be inadequate. Physical effects of aging begin to be noticeable in this period, and accomplishments at work may seem meaningless. Individuals unable to cope with the situation may become "psychologically retired," perform at a low level, and perhaps seek out new relationships, adopt alternative lifestyles, or use drugs excessively. If an individual can adjust successfully, however, to this period (and most men do), he will continue to do well in his career and ultimately prepare for retirement.

Changes or events in an individual's life can also con-

tribute to the degree of stress. Some events (such as becoming divorced) require far more adaptation than do others (such as changing churches). One study examined whether personal, social, occupational, and family-life adjustment events are related to the health of the individual. The findings indicated that the probability of ill-health is related to the number and severity of life-change events a person experiences.<sup>5</sup> As Dennis Organ states:

"The illness brought on by such demands for adjustment can appear in almost every specific form: digestive ailments, respiratory problems, back trouble, kidney malfunction, injuries to the bones or muscles, almost any breakdown in the body's economy. What is the explanation for this relationship? Significant changes in one's immediate life environment trigger a rapid succession of new situations with which one has to cope. . . . Thus whenever the body is most vulnerable, a breakdown can occur after a period of sufficiently great demands for social or psychological adjustment."

An employee's psychological composition is likely to affect the degree of stress experienced. One element of a person's psyche is the ego, which performs such functions as recalling, perceiving, judging, and conceptualizing. These functions give the individual self-control. The ego, which is constantly being bombarded with stimuli, has mechanisms to maintain equilibrium. Such mechanisms include identification, repression, sublimation, denial, rationalization, projection, idealization, reaction formation, substitution, and compensation.<sup>6</sup> If the ego cannot cope effectively with forces impinging on it, severe emotional problems may arise. "If there are too many emergencies . . . [the ego] may then overuse these mechanisms, and this in turn will seriously cripple . . . [the individual] psychologically."<sup>7</sup>

Certain people manifest a personality characteristic labeled "type A" behavior. Type A's are in a constant struggle to accomplish more and more in less and less time. They are aggressive and competitive, impose high goals for themselves, and thrive on deadlines and establish them if none exist. Interestingly, type A's do not perceive themselves as being under stress. In their now famous study, Meyer Friedman and Ray Rosenman found, however, that type A's have a higher than average risk of experiencing a heart attack.<sup>8</sup>

**Social Factors:** Social factors that may contribute to stress are the family, economic situation, and societal attitudes. When family demands (such as attending a party) and job demands (such as working late) conflict, pressure mounts because the employee cannot simultaneously satisfy family needs and job requirements. Family-related matters such as a bad marriage, problems with the children, imminent divorce, catastrophic illness in the family, or matriculation of the

**"Good working relationships not only provide an enjoyable work environment but also can help employees cope with their job-related problems, including stress."**

youngest child in college might also lead to a high level of stress. Employees in dual-career families may be especially vulnerable to stress. Jealousies over each spouse's career success; arguments concerning handling of various family duties and responsibilities; disagreements about how joint income will be allocated; and disputes regarding potential job relocation are examples of issues that could precipitate stress in two-career families.

During the past few years, adverse economic conditions have prevailed in the United States (although recently they have improved). Chronic unemployment, high prices and interest rates, reduced productivity, and massive bankruptcies have been the stressors. When the economy is bad, employees' financial worries are likely to increase because of uncertainty over their continued ability to make house and car payments, obtain a loan, feed and clothe the family in the style to which it has become accustomed, and allocate funds to discretionary items and savings. As financial concerns grow, employees may even begin to view their problems as being insoluble. Thus, poor economic conditions can contribute to the degree of stress employees experience.

Societal attitudes toward work may also contribute to the incidence of stress. One author notes that today's workers increasingly challenge authority, are resistant to change, and do not feel that hard work pays off.<sup>11</sup> This suggests that because of their positions of authority, supervisors inadvertently may place employees under stress. Also, companies that make organizational or technological changes may put strain on employees who are averse to eliminating the "old way" of doing things. Furthermore, employees who have a jaded view of work may experience stress simply because they do not see the relationship of effort, results, and job rewards.

**Organizational Factors:** At least five factors in the work setting could affect the incidence of stress: the nature of the job, the employee's role in the organization, the employee's career development, work relationships, and organizational structure.<sup>12</sup>

Employees engaged in a particular job may experience quantitative and qualitative overload.

Quantitative overload occurs when one has too much work; qualitative overload occurs when the work is too difficult.<sup>13</sup> Thus, quantitative and qualitative overload are stressors. These stressors have been found to be associated with higher instances of coronary heart disease, excessive drinking, lower work motivation, reduced self-esteem, and greater absenteeism.<sup>14</sup>

Employees' roles in an organization may induce stress. Two role concepts that have received extensive research are role conflict and ambiguity. Role conflict occurs when an individual receives incompatible demands from two or more people. For example, a customer may demand that a salesperson allow a 10% discount, but the salesperson's management may have a policy of selling only at list price. Role ambiguity occurs when an individual has inadequate information or knowledge with which to perform a job. These two potential stressors have been found to be related to higher levels of anxiety, job-related tension, and depression; lower job satisfaction; and increased incidence of physical ailments.<sup>15</sup>

When there is a disparity between an employee's actual career stage and the expected or desired career stage, stress may develop. Incongruency between actual and expected or desired career stage can occur in one of two ways. In one instance employees may not have achieved as much in their careers as they had expected. In the other situation careers may have developed too rapidly and employees cannot handle their increased responsibilities. One study determined that problems arising from one's career development may be associated with minor psychological symptoms, minor psychosomatic disorders, and serious mental disorders.<sup>16</sup>

Relationships with superiors, subordinates, and peers may affect the level of stress. Good working relationships not only provide an enjoyable work environment but also can help employees cope with their job-related problems, including stress. A supportive atmosphere that is highlighted by favorable working relationships can help employees buffer the onslaught of job vagaries.

The organizational structure can also contribute to the incidence of stress experienced by employees. Organizational structure refers to aspects of the structure of the firm that make work life satisfactory or stressful. Characteristics of organizational structure

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## Job Stress: An Unlisted Occupational Hazard

The work-related hazards with which occupational physicians typically deal are physical ones (e.g., industrial solvents, carbon monoxide, noise, lead, etc.). They generally can be measured in units that permit the identification of dose-response relationships and the establishment of standards. The problem is more subtle, however, when psychological stresses are considered.

Although psychosomatic medicine has long dealt with problems of psychological stress, rarely has the occupational physician included psychological job stress in the list of occupational health hazards. Consider the following pairs of jobs. The rate of death from disease of the cardiovascular system was approximately twice as great in 1950 for real estate agents and brokers as for mail carriers. The rate of suicide was approximately twice as high for policemen, sheriffs and marshals in 1950 as for lawyers and judges. There is no known physical hazard in the workplaces of these jobs that would account for these differences in causes of death. What may be the greatest difference between the members of each pair is the level of psychological stress generated. Certainly the health problems and causes of death noted are considered to have at least some psychogenic origins.

Other factors may, of course, account for these and the many other statistics indicating occupational differences in death rates due to diseases with possible psychosomatic implications. For exam-

ple, in some occupations more than others, there may be better medical screening so that only healthier individuals are selected for specific jobs. Also, some occupations may attract people with better or poorer health. The age of retirement may be younger in some occupations, thus reducing the overall age of the members of the occupation and the associated decline in health. Some occupations typically attract members from particular socio- and economic levels. Since occupation and health are both associated with socioeconomic status, occupation and health may be only artifactually related. The real culprit may be a difference in nutrition, personal or household hygiene, or access to adequate medical care.

But the hypothesis that job stress may contribute to poor health should not, even in light of these complications, be dismissed before it is more thoroughly examined. Talking with members of the stressed occupations mentioned above lends intuitively to its plausibility. Moreover, there is considerable evidence that stress induced in the experimental laboratory induces affective or physiological states that, if prolonged, are possible precursors of health disorders (for one job-oriented summary of this experimental work see Kahn and Quinn).<sup>1</sup> Finally, a growing body of evidence obtained from studies conducted at workplaces suggests that occupational stress is a causal factor in disease. For example, Cobb and Rose found that a highly stressed job, that of air traffic controller, had four times the rate of hypertension and twice the rate of peptic ulcers and diabetes mellitus as a comparison group of second class air-

men who had taken the same medical and physical examination.<sup>2</sup> McCord studied workers with stresses similar to those impinging upon air traffic controllers — railway dispatchers, who had been reported as having serious health problems associated with their jobs.<sup>3</sup> McCord found that these workers had an average age of death about 16 years below the national level for men, the most frequent cause of death being heart disease.

From a practical standpoint, however, knowing that a particular job is stressful is not necessarily useful. More practically relevant is the identification of those aspects of stress that cut across job classifications. Knowing that the job of traffic controller is a very stressful one is, for example, not a very useful bit of knowledge when it comes to programs for reducing job stress. All that could be done on the basis of this knowledge would be to eliminate the job, something that is hardly feasible. It is more useful to understand the effects on job strain of general classes of stresses so that the stresses can be combated in whatever jobs they occur. The purpose of the analysis reported here was, therefore, to identify among a representative population of American workers the associations between strain and six different types of job stress.

### Procedure

Data were obtained early in 1973 from personal interviews with a representative national sample of 1,496 employed persons 16 years of age or older who worked for pay 20 hours a week or more.

Questions on job stress and health were included among a large number of questions about one's job and attitudes

From the National Institute of Occupational Safety and Health (Dr. Margolis and Kries) and the Survey Research Center of The University of Michigan (Dr. Quinn).

Reprint requests to Working Conditions Papers, 3080 Institute for Social Research, The University of Michigan, Ann Arbor, Michigan 48106 (Dr. Quinn).

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# LIVING WITH STRESS

by Dennis L. Breo *A prescription for a healthier  
and more productive life*

Rule No. 1 is, Don't sweat the small stuff.  
Rule No. 2 is, It's all small stuff.

—Robert S. Eliot, M.D.

For far too many of us, alas, it's all serious stuff. Our competitive American culture reminds us every day that we must drive harder, run faster, strive higher. The result is often stress—a mismatch between our expectations and what our environment can deliver. To begin to find our own personal solution to life's stresses, medical experts say that we must first develop self-awareness. In time, and with discipline, this can effect remedies.

Dr. Robert S. Eliot—a native of Oak Park who founded the department of preventive and stress medicine at the University of Nebraska Medical Center and later a similar one in Phoenix, where he works today, is living proof. On a beautiful spring day 13 years ago, this world-renowned cardiologist, then 44, suffered a heart attack—as he stood on a podium lecturing on how to prevent heart attacks.

He made a full recovery. "If you have a heart attack," he jokes today, "mine is the kind to have—mild and in a hospital." Today he is in the forefront of a growing movement to teach people that they can be productive without being self-destructive.

In rethinking his life, this physician realized that what had almost killed him was an overindulgence in work and a belief that he was Superman. He had none of the five classic risk factors of heart disease: He was not fat; he didn't smoke or have high blood pressure, high blood cholesterol, or diabetes. He had good genes. His father lived to be 78 and his mother was still alive at 85, and neither exhibited any evidence of heart disease.

"What I had," he would later write, "was the 'Freggy Lee syndrome,' as in her mournful song *Is That All There Is?* My life had been a blur of overachievement to gain recognition.

But by whom and for what? To make such efforts for the maximum reward: the crushing chest pain of a heart attack?"

Dr. Eliot was his own first stress patient, and his prognosis was bleak until he dramatically changed his lifestyle. He rediscovered two strangers—his body and his family. He began a program of recreation and relaxation, and he became not "Robert the Robot," as he put it, but a human being who learned to enjoy his family and his work as more than props to his own ego. The past 13 years, he says, have been the best of his life, and as a consultant to Fortune 500 firms, foreign governments, and Pentagon officials, he is leading the movement to help people make stress work for them, not against them.

This movement has reached Chicago, among many other places. The management of stress is being taken out of pop psychology, where it has been mixed, and put into mainstream medicine, where many feel it belongs.

## What is stress?

Experts generally define stress as any activity that requires coping. The only way to totally avoid stress is to be dead. Properly used, stress—or challenge—is essential to a life of élan and vigor. Handling stress can be likened to adjusting the strings of a violin: too loose and you won't like the music; too tight and they might break.

It was a generation ago that a Canadian physician, Hans Selye, first popularized the idea of "stress without distress." Later, two San Francisco doctors, Meyer Friedman and Ray Rosenman, described the "type A" personality as a person "holding a stopwatch in a clenched fist." Dr. Eliot has gone a step further by saying that the person at highest risk from stress can be a type A or type B who, in the laboratory, is proved to be a "hot reactor," an individual who pays a dollar's

worth of physical energy for a dime's worth of mental stress.

Today, in the Chicago area, these pioneering concepts are being taught by university medical centers, by freestanding stress-management centers, and by hospital outreach departments. Both individual and family counseling and group classes are available. A wide network of referral centers for specific types of stress exists. Referrals from industry and family physicians are increasing. It is OK to admit to stress and to do something about it. The key concept is control: regaining a sense of control over your life.

Stress is a disease of choice. You choose the price you will pay for any given kind of stress. What is important is not to run on the fast track or your parents' track, but to run on your own track. Whatever resources you use to cope with stress must make sense to you and must work in your own real world.

A super salesman may not be able to break into a mantra whenever stress hits. A high-powered industrialist may not feel like jogging in his off hours. But, choosing from the resources available in the Chicago area, you can develop your own personal coping portfolio.

Whatever you choose, choose wisely. Untreated, stress can lead to physical illness, even death. When confronted squarely, however, stress can be the beacon that guides you to new heights of self-awareness, self-mastery, and even self-realization.

We all have colds. We all have stress. Colds, however, go away. Stress can linger for months, years, decades. If you think that you are under too much stress, you are not alone. More than 80 percent of those responding to a recent nationwide poll said that they "need less stress" in their lives.

Stress is a modern epidemic. Researchers estimate that we encounter a thousand times more stress-provoking events a year than our great-grandparents did, but the time for decision making remains the same or is even

Illustration by Arnold Roth

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## What is stress?

Stress is a state that you experience when you are facing an important challenge (e.g., when you are making a presentation to your superiors) or threat (e.g., someone questions your competence) and there is a possible imbalance between demands and resources.

Stress arises, therefore, in a specific kind of *interaction* between you and environment:

1. You *perceive* a situation of challenge, threat, or harm.
2. You *consider* the outcome *important* to your wellare.
3. You *are uncertain* whether you *will be able* to successfully meet the challenge or avoid the threat.

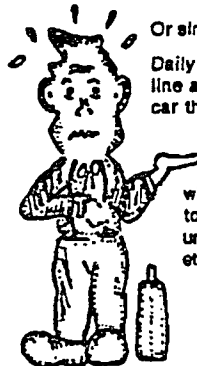
## What produces stress?

Almost any event will trigger stress for somebody.

### External stress triggers

Many stress triggers come from *outside*:

Unsatisfactory person-environment fit (responsibility without authority, job ambiguity, unpleasant colleague); change (new superior, new project, change in business conditions).

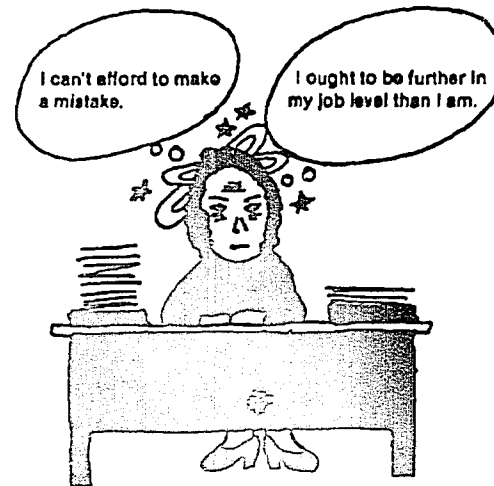


Or simply:





Daily hassles (the line at the bank, the car that won't start, the person who hogs the phone when you have to make an urgent call, etc., etc.).

### Internal stress triggers

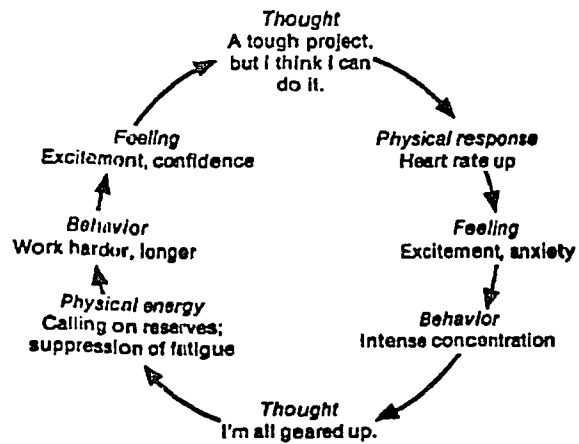
Some triggers come from *inside* ourselves (e.g., unrealistic self-expectations):



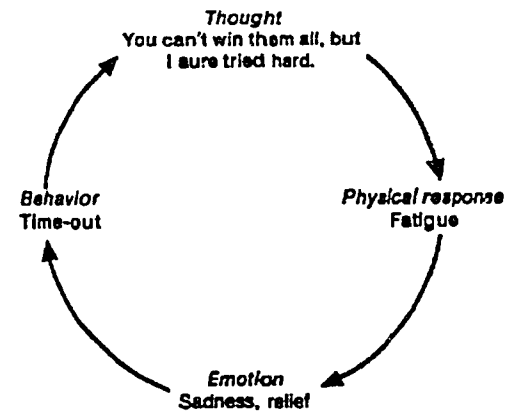
## What happens during a stress episode?—A first look

Before	The trigger	Mobilization	Recuperation
 <p><i>Before the trigger:</i> The mental and physical set with which you approach a potential stress trigger.</p>	 <p>Traffic light, broken shoelace. New task to master. "That same old routine is getting me down." "Now that I'm 40, it's now or never." Change in job, family circumstances.</p>	 <p><i>Dealing with the trigger:</i> A state of war in which all resources—thoughts, feelings, and physical responses—focus on meeting the <u>challenge</u> or <u>threat</u>.</p>	 <p><i>After the battle:</i> Time for relaxation. Closure on what is passed. Energy replenishment. Ready for the next challenge or threat.</p>

## What happens during a stress episode?— A second look



### Mobilization



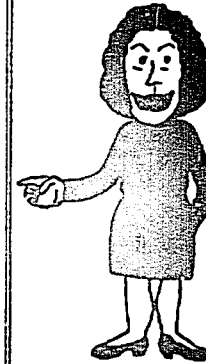
### Recuperation

### Rationale for considering stress management as a lifelong objective

Anyone who has participated in this course has *invested considerable time and effort* in learning how to manage stress more effectively. You do not have to be reminded of what it took to attend two meetings weekly, practice homework daily, and fill out endless forms. . . . But you stuck to it and for most of you the benefits are obvious. Not only do you *personally feel better*, but in many cases spouses, co-workers, and acquaintances are beginning to *comment favorably* on changes in your behavior. You are now ready to graduate.

Graduation from a course, however, does not in itself guarantee a lifetime of effective stress management. Old harmful habits have a *much longer history* than do your newly developed coping skills, and it is very easy to slip back into old ways. Mark Twain once remarked that it is very easy to stop smoking; in fact, he had done it many times! Learning a new habit is relatively easy; to maintain it is much harder.

Fortunately, there are techniques that you can use to *protect your investment* in good stress management and even make it grow.



## Anticipate

The best time to correct slipups is before they happen. To help you *anticipate* potential trouble spots:

- *Make a list* of the events or situations (travel, illness, job crisis) that might cause you to stop using your new stress management skills. Any disruption of the normal routine of life is a *signal* to pay careful attention to your *stress management strategies*.
- *Keep a chart of daily tension and pleasure levels*. A drop in pleasure level and/or a rise in tension level is a *signal* that you are *vulnerable* to stress problems. Try to correct the *imbalance* as soon as you can, either by lowering the tension level or by raising the pleasure level. If no immediate change in either is possible, be aware that you are depleting resistance resources and allow for a period of recovery after the crisis has passed.

## Diagnose

- Sometimes, what has gone wrong may be fairly obvious to you. For instance, the announcement of a new boss for your department may create a situation of uncertainty with feelings of physical and mental tension. If the stress trigger is fairly obvious, then turn your attention to dealing with your reactions to it.
- Sometimes, you just don't feel right, but you can't put *your finger on any specific trigger*. Here is a chance to display your *talents as a sleuth*. Start keeping a *stress diary* again, noting hourly, situation, tension level, and signs. Once you have a week's records, sit down and study them. *What times of day, what situations, and what signs* correlated with high tension levels? *Read* the stress manual and see if you can pick up any hints as to where the problem lies.

### Take remedial action

Once you have a tentative *diagnosis*, make a plan for dealing with the problem. During the course of this program you have learned a variety of techniques for controlling *physical, behavioral, and cognitive* signs of tension, as well as how to increase your pleasure level. Reread the manual and decide how to select and combine strategies so as to develop an *action plan appropriate* to the problem.

### Reevaluate

After you have engaged in trouble shooting for a while, *reevaluate*. Has your remedial action improved your *tension-pleasure balance*? Are there any other strategies you might use to improve it still further?

### Take credit

- Even constant practice of stress management will not make you *completely* immune to *all the vicissitudes of life*. But if you can keep your head when all about you are losing theirs, if you can learn to roll with the punches, then you will have done a great deal to *improve the quality of your life* and of the lives of people who live and work with you.
- For this, you have *reason to be proud*. You may not be able to *control the world*, but you have learned to *control yourself*.





Homework	
Stress diary—Skills for detecting stress	
What is the goal?	To learn to discriminate your physical and emotional signs of tension.
What do I have to do?	<ol style="list-style-type: none"> <li>1. Fill in the sheet hourly, noting your tension level (low-moderate-high) and physical and emotional signs of tension (See example sheet.)</li> <li>2. Use a separate sheet for each day of recording</li> </ol>

Daily stress planner																																											
Name:		Date:																																									
<div>Plan</div> <div>Self-talk strategy</div> <table border="1"><thead><tr><th>Target situation</th><th>Before</th><th>During</th><th>After</th></tr></thead><tbody><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr></tbody></table> <div>Evaluation</div> <table border="1"><thead><tr><th>What happened?</th><th>How did you feel?</th></tr></thead><tbody><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></tbody></table>				Target situation	Before	During	After																									What happened?	How did you feel?										
Target situation	Before	During	After																																								
What happened?	How did you feel?																																										

Relaxation practice			Name:									
Date	Time	Tension level										Comments
		Before					After					
	First practice											
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**Appendix E**  
**Protocol for Relaxation**

## PROTOCOL FOR RELAXATION

The following protocol comes from a standard hypnotic procedure that can be used for relaxation training. It was modified to include eye fixation and diaphragmatic breathing (Golden, Dowd & Friedberg, 1987 and Poppen, 1988). This is the protocol that was used in the biofeedback training sessions.

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I would like for you to sit comfortable in the chair and allow yourself to start to relax. Just allow yourself to unwind as much as you can.

### Part I

*"Now I would like for you to start to concentrate on your breathing. I would like for you to breathe just a little differently than you normally breathe. Generally, when you breathe your chest will raise and fall and your stomach will not do very much. The way I will teach you to breathe will allow you to use your stomach and at the same time relax your chest and shoulders. As you inhale, imagine your stomach to be a balloon which inflates, and your stomach raises. As you exhale, the balloon deflates, and your stomach will fall. As you do this, your chest should remain still. One thing that may help is to imagine that you are floating on a boat, and the boat is rolling with the waves of the ocean. Allow your stomach to raise and fall, as the boat raises and falls with the ocean. Remember that the chest is to remain still.*

*Next, start to slow your breathing down by pausing very briefly at the top and the bottom of each breath. Pause only for a half second, do not hold your breath or pause so that it feels uncomfortable or unnatural. Notice how there is a slight increase in tension as you breathe in, and a decrease as you breathe out. Concentrate on the tension flowing out with each breath. You will experience a slight increase in tension as you inhale, but as you exhale try to let go and allow your body to feel heavy and more, and more relaxed. Each time you exhale you will feel the tension leaving your body."*

### Part II

#### Eye Fixation

*"While you continue to breathe very smoothly and very slowly, I would like for you to pick a spot, any spot will do, and keep on staring at it. If your eyes should wander, just go back to the same spot. Just keep on staring at it until*

*your eyes become tired of it. Your eyes may start to bat just a bit as you try to keep it in focus. While you stare at your spot, you may notice some interesting phenomena. You may experience some blurring of your vision, your spot will start to move, pulsating or even disappear. As this happens you will start to get a heaviness in your eyelids. It may be easier to just allow your eyes to close as they are too tired to remain open. The important part of this experience is that you remember that you are in total control, and will relax only as much as you choose to."*

### **Part III**

#### **Relaxation**

*"Continue to breath smoothly, slowly and deeply. Each time you exhale you can let go of more, and more tension. Let your body start to sink into the chair. Feel your entire body start to relax. As start to relax you will get a heavy feeling start to flow through your body. Let that feeling flow down your arms and down your legs. Just allow them to go limp and become more relaxed. Allow that same feeling of relaxation to move from your arms to your shoulders and neck. Just let the shoulder fall and start to be extremely heavy. Now allow that same feeling of heaviness to flow down your back. Do not try to support yourself just let the chair support your relaxed body. Take the time to check you body for tension. Every muscle in your body should be relaxed and starting to feel warm and heavy. The next part of the body that you will relax will the face and head. Let go of the tension in your jaws. Let the jaw just hang slack, teeth and lips will come slightly apart. Feel the relaxation spread over your entire surface of your face. Feel your face muscles become smooth and soft. This will also assist with the relaxation of you neck muscles.*

*Try to become aware of the pleasant sensations that accompany the relaxation. The more you relax the more changes you will experience in your body weight and body temperature. Continue to breath deeply, smoothly, and slowly and allow your to drift further into a state of relaxation."*

### **Part IV**

#### **Termination**

*"Now you will begin, at your own pace, to return to a fully alert, wide-awake state. Feel free t take your time. Go at a pace that is comfortable for you. Take it slow. Start to move a little, very slowly and at your own pace, start to open your eyes, returning to an alert state, feeling relaxed, refreshed, and wide awake."*

## **Appendix F**

### **Approval Letter From the Human Subjects Institutional Review Board**

Human Subjects Institutional Review Board

Kalamazoo Michigan 49008-3899

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## WESTERN MICHIGAN UNIVERSITY

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TO: Ollie Barnes  
FROM: Ellen Page-Robin, Chair *EP-R*  
RE: Research Protocol  
DATE: April 25, 1989

This letter will serve as confirmation that your research protocol, "Assessment of Differences Between Black Employees and White Employees Response to Biofeedback Treatment," is now complete and has been signed off by the HSIRB.

If you have any further questions, please contact me at 387-2647.



## **Appendix G**

### **Demographic Profile**

### DEMOGRAPHIC PROFILE

SEX	RACE	AGE	JOB CLASSIFICATION	TREATMENT GROUP
Female	White	45	Production	Traditional
Female	White	38	Production	Traditional
Female	White	57	Production	Biofeedback
Female	White	61	Production	Biofeedback
Male	White	42	Production	Biofeedback
Female	White	29	Production	Traditional
Male	White	61	Technical	Biofeedback
Male	White	44	Professional	Biofeedback
Male	White	46	Professional	Biofeedback
Female	White	38	Professional	Biofeedback
Male	White	46	Professional	Traditional
Female	White	35	Professional	Biofeedback
Male	White	39	Production	Traditional
Female	White	42	Professional	Traditional
Male	White	58	Production	Traditional
Female	White	42	Production	Traditional
Female	White	49	Technical	Biofeedback
Male	White	39	Production	Biofeedback
Male	White	52	Production	Traditional
Female	White	27	Professional	Traditional
Female	White	40	Professional	Biofeedback
Male	White	36	Technical	Biofeedback
Male	White	40	Technical	Biofeedback
Male	White	43	Technical	Biofeedback
Female	White	28	Clerical	Traditional
Female	White	47	Production	Traditional
Female	White	46	Technical	Traditional
Female	White	33	Clerical	Control
Female	White	38	Clerical	Control
Female	White	50	Clerical	Control
Female	White	23	Clerical	Control
Female	White	41	Professional	Control
Female	White	26	Professional	Control
Female	White	23	Clerical	Control
Female	White	30	Professional	Control
Female	White	39	Professional	Control
Female	White	40	Technical	Control

### DEMOGRAPHIC PROFILE

SEX	RACE	AGE	JOB CLASSIFICATION	TREATMENT GROUP
Female	A-A*	38	Technical	Biofeedback
Female	A-A	35	Technical	Biofeedback
Female	A-A	41	Professional	Traditional
Male	A-A	43	Professional	Traditional
Male	A-A	32	Production	Traditional
Male	A-A	32	Production	Traditional
Male	A-A	33	Production	Biofeedback
Female	A-A	42	Clerical	Biofeedback
Male	A-A	31	Technical	Traditional
Male	A-A	64	Professional	Traditional
Male	A-A	40	Professional	Traditional
Female	A-A	41	Clerical	Biofeedback
Male	A-A	45	Production	Biofeedback
Male	A-A	39	Professional	Biofeedback
Male	A-A	48	Professional	Biofeedback
Female	A-A	36	Professional	Traditional
Male	A-A	26	Production	Biofeedback
Female	A-A	28	Clerical	Traditional
Female	A-A	47	Technical	Biofeedback
Male	A-A	45	Technical	Biofeedback
Male	A-A	33	Technical	Traditional
Female	A-A	29	Production	Traditional
Male	A-A	37	Production	Biofeedback
Female	A-A	43	Technical	Biofeedback
Female	A-A	41	Clerical	Biofeedback
Male	A-A	44	Professional	Traditional
Male	A-A	32	Production	Traditional
Female	A-A	24	Technical	Control
Female	A-A	59	Professional	Control
Female	A-A	40	Clerical	Control
Male	A-A	36	Professional	Control
Female	A-A	34	Clerical	Control
Male	A-A	38	Production	Control
Male	A-A	37	Professional	Control
Female	A-A	22	Production	Control
Female	A-A	31	Clerical	Control
Female	A-A	23	Professional	Control

\*African-American

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