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Stress and Anxiety Levels of Exercising Versus Sedentary Male Adults

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STRESS AND ANXIETY LEVELS OF

EXERCISING VERSUS SEDENTARY MALE ADULTS
(TITLE)

BY

Michael James Hanley

THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
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STRESS AND ANXIETY LEVELS OF EXERCISING VERSUS SEDENTARY MALE ADULTS

A Thesis Abstract

Presented to

The Faculty of the Graduate School

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In Partial Fulfillment

of the Requirements for the Degree

Master of Science in Physical Education

by

Michael James Hanley

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ABSTRACT

The purpose of this study was to compare stress and anxiety levels of exercising and sedentary male adults at Eastern Illinois University in Charleston, Illinois.

Forty-four male adults were selected as subjects for the study. Thirty-two subjects were chosen from an Adult Fitness group and comprised the exercising group. The sedentary group, chosen at random, consisted of twelve staff members who were not currently in a regular exercise program.

The Anxiety Scale Questionnaire developed by the Institute for Personality and Ability Testing (IPAT) was used. Using a provided answer key, a raw score was obtained for each participant. Raw scores were also computed for both groups in each of the five sections of the test.

Mean scores, standard deviations, and t-tests were calculated for each of the five sections. The t-score of 2.021 was needed to determine statistical significance at the .05 level and forty-two degrees of freedom.

The sedentary group was shown to be significantly more anxious, more apprehensive, more tense, more emotionally unstable and more suspicious than the exercising group. The non-exercisers also showed less self-control.

The study concluded that exercising male adults showed overall less tension and anxiety than sedentary male adults at Eastern Illinois University.

CHAPTER 1

INTRODUCTION

With the onset of the nuclear age, high inflation, a tight job market, world political unrest, etc., stress is a constant component of everyday life. The inability to deal with stress may result in a variety of physiological and psychological disorders. As Girdano and Everly (1979) stated, "stress...if prolonged, can fatigue or damage the body to the point of malfunction and disease." If stress is to be a daily companion, individuals must find ways to deal with it fruitfully and productively. More studies are needed to determine effective means of coping with stress.

Need for the Study

Stress may lead to various physiological and psychological maladies which, if left untreated, may lead to impairment or even death. Among the problems associated with stress include nervous reactions such as hypochondriasis, nervousness, or nervous breakdown; and psychosomatic responses including anything from alcoholism to under-eating (Graham-Bonnalie, 1972), cancer, rheumatoid arthritis, and hyperthyroidism (Bieliauskas, 1982).

With the prevalance of stress, methods have been devised to deal with it. A quick glance of the literature revealed two of the

most common to be chemotherapy and psychotherapy. Although effective, both are expensive, and chemotherapy requires constant supervision by doctors, druggists, etc. Another possible treatment mode is exercise. It is less expensive and requires only a doctor's physical and early supervision by a professional trained in exercise prescription. The benefits of exercise in reducing stress and anxiety are documented. As Leon (1978) stated, "exercise, even minimal exercise for a short duration, alleviated levels of anxiety."

Assumptions

For this study, one must accept that stress levels and anxiety levels are closely related, and that one may be judged by measuring the other.

Purpose of the Study

The purpose of this study was to determine the difference, if any, of stress and anxiety levels in a group of regularly exercising adults compared to a group of sedentary adults.

Null Hypothesis

For this study, it is hypothesized that there is no difference in stress and anxiety levels of exercising and sedentary adults.

Limitations of the Study

There were factors which limited the effectiveness of the study.

The definition as to what constitutes a "sedentary" or "exercising" individual is arbitrary. It is impossible to determine when someone goes from being sedentary to being a regular exerciser. The standard used for this study was based on the number of minutes exercised per month. To attain the status of an exerciser, one would have to exercise for a minimum of twenty minutes per day, three days per week for four weeks. This exercise would have to take place for twelve consecutive months. Anything less than this would not necessarily cause someone to be labeled sedentary. The arbitrary figure used for sedentary adults was anything less than one hundred minutes per month.

By using Eastern Illinois University faculty and staff working during the summer session, the available population was diminished. It has been estimated that faculty and staff are reduced by one-third during the summer months. Some persons in both target populations were found to be either on vacation or not teaching during the summer, and thus unavailable.

Definition of Terms

The following terms are defined for the purpose of this study:

Anxiety

Anxiety results from conflict and may present itself in a variety of ways. As Cureton (1963) stated "Anxiety is a mental manifestation of conflict. It may show as a phobic reaction, apprehension, or as a psychosomatic symptom. When anxiety becomes excessive it impairs mental functions and disrupts physiological efficiency."

Exercising Adult

An exercising adult is anyone between the ages of 23 and 65 who participates in activities such as jogging, swimming, walking, etc. away from the work setting for at least 240 minutes per month for at least twelve consecutive months.

Sedentary Adult

A sedentary adult is anyone aged 23 to 65 who participates in activities such as jogging, swimming, walking, etc. away from the job site for less than 100 minutes per month for less than twelve consecutive months.

Stress

Stress is a common factor which affects both the mind and body. If left untreated, stress can be damaging. As Girdano and Everly (1979) stated, "Stress is a fairly predictable arousal of psycho-physiological (mind-body) systems which, if prolonged, can fatigue or damage the system to the point of malfunction and disease."

CHAPTER II

REVIEW OF RELATED LITERATURE

The term "exercise" means many things to many people. Some regard it as playing golf, others walking to the filing cabinet or to a co-worker's office, while others consider nothing less than running for an hour a day for seven days a week as exercise. Research has shown that exercise in almost any form will produce benefits such as reducing anxiety and stress. The following review of literature has been presented in sections relating to physiological benefits and psychological benefits.

Physiological Benefits and their Relationship to Anxiety

The benefits of exercise, as noted earlier, may be of a physiological as well as psychological nature. The physiological changes may cause improvements in mood which decrease anxiety. Michael (1957) stated that the positive feelings gained from exercising are the result, in part, of an adjustment of the autonomic nervous system. Since stress also affects the autonomic nervous system, a conditioned positive response by this system would lead to a more efficient reaction to stress. Michael continued by stating the body's three reactions to stress as follows:

1. Shock, which is a depression of the nervous system.
2. Countershock, which is an increase in nervous activity to offset shock.
3. Exhaustion, which is the inability of the body to maintain resistance any longer.

According to Michael (1957), exercise improves the autonomic nervous system and leads to a reduction in stress. He stated, "The shock phase should be minimal, and the countershock mechanism should adjust rapidly. The result would reduce the chance for exhaustion because of minimum counterbalance activity."

Cureton (1963) found subjects having a higher resting heart rate showed higher levels of anxiety. Since physical activity reduces the resting heart rate after a period of time, Cureton concluded that exercise and lower anxiety levels were related. He stated,

> ...it is certain that such endurance training, if it is long enough, develops better systemic circulation, and reduces the tendencies toward anxiety,..., nervous diarrhea, ulcers, indigestion, and cardiospasm.

Psychological Benefits

Cureton (1963) studied 2,500 adults in physical fitness programs and found them to make more friends, have less nervous tension, and have greater mental and physical energy. Cureton stated the relationship between physical fitness and stress as follows:

> Physical fitness is characterized by a positive outlook on work and health. It is characterized by an ambition to work and succeed, a willingness to strive and to minimize ailments, fatigue, frustrations, and the hazards of life.

> The fit person is relatively more ready for action, and has more movement in general for pleasure, business, and for health. The fit person is not as conscious of fatigue, hence has less nervous tension and has more confidence...

Girten (1966) found an inverse relationship between physical fitness and mental fatigue. He stated, "it appears that physical fitness and mental fatigue have much in common...if you increase physical fitness, you can decrease mental fatigue."

Hammett (1967) studied tension-anxiety and its relationship to physical fitness by using athletes as his fit group. After administering the Minnesota Multiphasic Personality Inventory to both athletes and non-athletes, the athletes were found to have lower anxiety scores than non-athletes.

McPherson (1967) used groups of experienced exercisers, normal exercisers, normal controls, cardiac exercisers, and cardiac controls. He found the experienced exercisers showed more and greater positive feelings in the areas of energy, ambition, self-assertion, relaxation, patience, aggression, humor, optimism, and friendliness. The normal exercisers showed the next highest amount of positive feelings followed by cardiac exercisers, normal controls, and cardiac controls.

Collingwood (1972) studied twenty-five male rehabilitation clients who underwent a four week physical training program to determine the effects of physical training on personal attitude, physical, intellectual, and emotional behaviors. The subjects

demonstrated a greater significant increase over a matched control group in physical fitness performance, body attitude, positive self-attitude, and self-acceptance.

Folkins (1970), in a study of exercisers and non-exercisers, found that exercisers showed significant decreases in anxiety and depression while the non-exercisers showed no change. He also found that many of the exercising subjects reported they felt better and happier.

Carter (1977) found a significant association between happiness and physical fitness. He found a greater majority (72 percent) of the people who considered themselves very happy maintained an optimum level of physical fitness, while 37 percent of those pretty happy and 35 percent of those self-described as not too happy were physically fit.

Ismail and Young (1977) studied 90 Purdue University faculty and staff, and local businessmen 21 to 61 years of age who volunteered for a four month physical fitness program. At the conclusion of the program, they found an improvement in physical fitness levels, but not a marked change in personality. They concluded it would take a considerably longer period of regular exercise before personality would change.

Donoghue (1977) found evidence of improved work performance following physical fitness programs. Two hundred and thirty-nine executives of National Aeronautics and Space Administration, 35 to 55 years of age, attended the program regularly, and 50 percent reported improved work performance, 49 percent felt a more positive attitude towards work while 50 percent said they felt less stress and tension.

Leon (1978) conducted tests using joggers and found they showed a significant drop in anxiety after a training program while a control group showed a slight increase over the same period of time. Leon stated that exercise, even minimal exercise for a short duration, alleviated levels of anxiety.

Blue (1979) cited two case studies of patients diagnosed as suffering from moderate depression. Both patients had been prescribed anti-depressants, and both showed no effects from the medication. Both then agreed to an aerobic running program three times a week. After three weeks, both patients had lower depression scores as measured by the Zung Depression Scale. Blue stated that running may prove to have anti-depressant properties for many individuals with varying degrees of depression.

Jones (1979) studied a group of runners who ran three times per week for forty-five minutes per session at 75 percent of their maximum cardiac output for one year and found the subjects not only to

have improved cardiovascularly, but had become more relaxed, assertive, and happy-go-lucky.

Smith and Brandt (1979) conducted a study at the Durham (N.C.) County Mental Health Center. They found that physical exercise can provide a release of pent-up tensions and internalized aggression. Without proper channelling, these emotions may become self-destructive, causing depression, psychosomatic illness, and insomnia.

Wilson, et. al. (1980) tested marathon runners, joggers, and non-exercisers and found that the marathoners and joggers felt less depression, less confusion, and more vigor than the non-exercisers.

Folkins (1981) compared running and psychotherapy as forms of treatment in lowering depression and found that running appeared to be at least as effective as psychotherapy in reducing depression scale scores.

Schuldt (1982) questioned joggers and found a very high relationship between jogging and lower anxiety under stressful situations as well as more patience on the job.

Summary

The literature reviewed offers supporting evidence that exercise is beneficial, and these benefits are both physiological and psychological. The physiological benefits include an adjustment of the

autonomic nervous system, development of more efficient circulatory system, reduced resting heart rates, and reduced occurrences of ulcers, indigestion and cardiospasm. Psychological benefits include less nervous tension, a more positive outlook on life, less mental fatigue, less anxiety, increased happiness, and less depression.

CHAPTER III

METHODOLOGY

This study was concerned with determining whether a difference exists in stress and anxiety levels when comparing exercising adult males to sedentary adult males. The presentation of the methods and procedures is divided into four major sections representing the subjects, testing procedures, returns, and statistical procedures.

Subjects

The subjects were 44 male faculty and staff members at Eastern Illinois University. Their ages ranged from 23 to 65 years of age. The subjects were divided into exercising or sedentary groups based on responses made on an Activity Level Sheet attached to the test questionnaire. A list of known exercising adults was provided by the Eastern Illinois University Run for Your Life Program. The sedentary group was chosen using a random number table from among male faculty and staff members at Eastern Illinois University. When it was determined that any of the randomly selected members fit the criteria of an exerciser, they were placed into that category.

Testing Procedures

The testing procedures have been described in two subsections including the test and test administration.

The Test

The test used in the study was the Anxiety Scale Questionnaire developed by the Institute for Personality and Ability Testing (IPAT). The test was divided into five primary anxiety components: Component O (apprehension) consisted of twelve questions, Component Q_4 (tension) consisted of ten questions, Component Q_3 (low self-control) consisted of eight questions, Component C (emotional instability) consisted of six questions, and Component L (suspicion) consisted of four questions. There was a total of 40 questions on the test, with three responses to choose from for each question. A numerical value was assigned to each response, thus yielding a total raw score for the test.

The validity has been demonstrated using three approaches. The first approach correlated test scores with the pure anxiety factor it was designed to measure, and a correlation of .90 was shown. The second approach was a correlation between test scores and clinically judged anxiety levels. A correlation of .49 was found. The third approach correlated Anxiety Scale Questionnaire scores with other anxiety questionnaires. A correlation of .70 was found using this approach.

This test was chosen due to its ease in administering, answering, and scoring.

Test Administration

Each candidate was telephoned to determine their willingness to take the test. They were informed as to the purpose and the nature of the test. All candidates agreed to cooperate.

The tests were either delivered in person or sent through Eastern Illinois University campus mail. The subjects were informed that they could complete the test at work or at home. They were then asked to return the tests via EIU campus mail or to make arrangements to have the test picked up.

Returns

Forty-four out of the forty-six subjects contacted who agreed to take the test returned the questionnaire. Eventually, of the forty-four returns, thirty-two were classified as exercisers and twelve were classified as sedentary.

Statistical Procedures

Using the provided answer key, a raw score was obtained for each participant (see Appendix A). When comparing scores, a higher raw score indicated a higher level of anxiety. Using a table, sten scores were derived from the raw scores. A mean score and standard deviation were calculated for each group, and a t-test was used to compare the mean scores (IPAT, 1982).

Raw scores were also computed for both groups in each of the five sections of the test. Mean scores, standard deviations, and t-tests were calculated for each of the five sections.

The t-score of 2.021 was needed to determine statistical significance at the .05 level and 42 degrees of freedom.

CHAPTER IV

ANALYSIS OF DATA

The purpose of this study was to determine whether a significant difference existed in stress and anxiety levels of exercising adults as compared to non-exercising adults. The subjects were forty-four male faculty and staff members of Eastern Illinois University.

A mean score, standard deviation, and t-score were calculated for both groups based on raw total scores as well as for each of the five sections comprising the test. Sten scores were determined from the raw scores.

This chapter has been organized to present this information.

Presentation of the Data

The data has been organized to present the computations for raw score totals and for each of the five test sections: Component O, Apprehension; Component Q_4, Tension; Component Q_3, Low Self-Control; Component C, Emotional Instability; and Component L, Suspicion.

Raw scores and sten scores have been presented in Table 1.

TABLE 1

Raw and Sten Scores for Exercising and Sedentary Subjects

EXERCISING SUBJECTS			SEDENTARY SUBJECTS		
Raw Score	Sten Score	Respondent	Raw Score	Sten Score	Respondent
0 - 4	1	2	0 - 4	1	0
5 - 9	2	5	5 - 9	2	0
10 - 14	3	10	10 - 14	3	0
15 - 20	4	6	15 - 20	4	1
21 - 25	5	3	21 - 25	5	3
26 - 31	6	2	26 - 31	6	4
32 - 38	7	4	32 - 38	7	0
39 - 44	8	0	39 - 44	8	2
45 - 51	9	0	45 - 51	9	2
52 - 80	10	0	52 - 80	10	0
		Total 32			Total 12

Raw Score Totals

A high raw score total indicated a high anxiety level and a low raw score indicated a low anxiety level. The highest possible raw score was 80, with the lowest possible being 0. Sten scores of 4, 5, 6, or 7 indicated an average level of anxiety; sten scores of 1, 2, or 3 indicated an unusually relaxed or secure individual; a sten score of 8 indicated an anxiety level that was nearing significance; and sten scores as high as 9 or 10 are only found in about one out of twenty individuals (IPAT, 1976).

The exercising group had a mean score of 15, a standard deviation of 10.02, and an average sten score of 3.77. The sedentary group had a mean of 25.6 for the raw scores, with a standard deviation of 13.97, and an average sten of 6.42. The t-test yielded a score of 3.01, significant at the .05 level of confidence. This information has been presented in Table 2.

Component O, Apprehension

Component O consisted of twelve questions. The mean score for the exercise group on this section was 5.19 with a standard deviation of 3.41. The sedentary group had a mean score of 10.25 and a standard deviation of 4.0. The t-test yielded a score of 4.16 which was statistically significant at the .05 level. These numbers showed the sedentary group to be significantly more apprehensive than the exercise group. This information is presented in Table 3.

TABLE 2

Mean Score, Standard Deviation, and t-Score for Eastern Illinois University Male Faculty and Staff Members on the Anxiety Scale Questionnaire.

	Exercising Group	Sedentary Group
Mean Score	15.00	25.60
Standard Deviation	10.02	13.98
t-Score	3.01*	

* statistically significant at .05 level.

TABLE 3

Mean Score, Standard Deviation, and t-Score for 44 Exercising and Sedentary Eastern Illinois University Male Faculty and Staff Members for Apprehension

	Exercising Group	Sedentary Group
Mean Score	5.19	10.25
Standard Deviation	3.41	4.00
t-Score	4.16*	

* statistically significant at .05 level.

Component Q_4, Tension

Component Q_4 consisted of ten questions. The exercise group had a mean score of 3.22 with a standard deviation of 2.75. The sedentary group had an average score of 8.33 with a standard deviation of 3.68. The t-score was 4.96 which was statistically significant at the .05 level. These numbers showed the sedentary group to be significantly more tense than the exercise group. This information is presented in Table 4.

Component Q_3, Low Self-Control

This section consisted of eight questions. The exercise group had a mean score of 4.13 with a standard deviation of 2.84. The sedentary group had an average score of 5.25 for the section with a standard deviation of 2.34. The resulting t-score of 1.22 was not statistically significant at the .05 level. These figures showed the sedentary group to have less self-control than the exercise group. This information is presented in Table 5.

TABLE 4

Mean Score, Standard Deviation, and t-Score for 44 Exercising and Sedentary Eastern Illinois University Male Faculty and Staff Members for Tension

	Exercising Group	Sedentary Group
Mean Score	3.22	8.33
Standard Deviation	2.75	3.68
t-Score	4.96*	

* statistically significant at .05 level.

TABLE 5

Mean Score, Standard Deviation, and t-Score for 44 Exercising and Sedentary Eastern Illinois University Male Faculty and Staff Members for Low Self-Control

	Exercising Group	Sedentary Group
Mean Score	4.13	5.25
Standard Deviation	2.84	2.34
t-Score	1.22	

Component C, Emotional Instability

Component C consisted of six questions. The mean score of the exercise group was 1.55 with a standard deviation of 1.52. The sedentary group had a mean score of 3 with a standard deviation of 2.3. The t-score was calculated to be 2.42 which was statistically significant at the .05 level. The numbers showed the sedentary group to be significantly less emotionally stable than the exercise group. This information is presented in Table 6.

Component L, Suspicion

Component L consisted of four questions. The exercise group had a mean score of 1.87 for the section with a standard deviation of 1.02. The sedentary group had a mean score of 3.75 with a standard deviation of 1.35. The t-test yielded a score of 4.44 which was statistically significant at the .05 level. These figures showed the sedentary group was significantly more suspicious than the exercising group. This information is presented in Table 7.

TABLE 6

Mean Score, Standard Deviation, and t-Score for 44 Exercising and Sedentary Eastern Illinois University Male Faculty and Staff Members for Emotional Instability

	Exercising Group	Sedentary Group
Mean Score	1.55	3.00
Standard Deviation	1.52	2.30
t-Score	2.42*	

* statistically significant at .05 level.

TABLE 7

Mean Score, Standard Deviation, and t-Score for 44 Exercising and Sedentary Eastern Illinois University Male Faculty and Staff Members for Suspicion

	Exercising Group	Sedentary Group
Mean Score	1.87	3.75
Standard Deviation	1.02	1.35
t-Score	4.44*	

* statistically significant at .05 level.

Discussion of the Data

The results of this study for the most part agreed with the conclusions of a number of similar investigations reviewed.

Sedentary subjects were found to have significantly higher anxiety levels as compared to the exercising subjects. Based on sten scores, both groups were found to have an average level of anxiety, with the exercising group at the very low end of what constitutes average anxiety, and the sedentary group at the higher end of what constitutes average anxiety (IPAT, 1976). However, the exercising group was significantly less suspicious, less emotionally unstable, less apprehensive, and less tense than their sedentary counterparts. The only area in which there was no significant difference between the two groups was in the area of self-control. Both groups showed high levels of self-control.

These findings tend to agree with previous studies cited (Cureton, 1963; Hammett, 1967; McPherson, 1967; Folkins, 1976; Donoghue, 1977; Leon, 1978; and Blue, 1979).

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to determine whether or not a significant difference existed between stress and anxiety levels of exercising male adults as compared to sedentary male adults.

The subjects were 44 Eastern Illinois University male faculty and staff members who were on campus during the 1983 Summer Session.

The subjects were given an Anxiety Scale Questionnaire developed by the Institute for Personality and Ability Testing. The test consisted of 40 questions in five anxiety areas: tension, apprehension, low self-control, emotional instability, and suspicion. An Activity Level Sheet was attached to determine whether the subject should be classified as exercising or sedentary.

Raw scores on the Questionnaire were tallied with mean scores and standard deviation on each of the five anxiety areas computed for each group. Raw scores were also converted into sten scores. A t-test was used to determine the significance of the difference between the exercise and sedentary group means for each of the five anxiety areas.

Conclusions

The following conclusions are presented based on the information in this study:

Sedentary participants have higher stress and anxiety levels than those who exercise.

Sedentary faculty members are more apprehensive, tense, less emotionally stable, and more suspicious than the exercising faculty members.

The exercising faculty did not differ from the sedentary faculty in the area of self-control.

Recommendations

The following recommendations are presented:

1. The questionnaire should be administered to a sedentary group that is beginning an exercise program. The questionnaire should be given prior to the onset of regular exercise and after the period of time required to be considered an exerciser as stated previously. This would determine whether people who have low levels of stress and anxiety tend to exercise or whether the exercise causes lower levels of stress and anxiety.
2. Physical factors, such as heart rate and blood pressure, may also be used in determining stress and anxiety levels.

BIBLIOGRAPHY

Bieliauskas, Dr. Linas A. Stress and Its Relationship to Health and Illness. Boulder: Westview Press, 1982

Blue, F. R. "Aerobic Running as a Treatment for Moderate Depression." Perceptual Motor Skills, 48(1): 228, February, 1979.

Carter, R. "Exercise and Happiness." Journal of Sports Medicine and Physical Fitness, 17(3): 307-313, 1977.

Collingwood, T. R. "The Effects of Physical Training Upon Behavior and Self Attitudes." Journal of Clinical Psychology, 28(4): 583-585, 1972.

Cureton, Dr. Thomas. "Improvements of Psychological States by Means of Exercise-Fitness Programs." Journal of the Association for Physical and Mental Rehabilitation, 17(1): 14-18, January-February, 1963.

Donoghue, S. "The Correlation Between Physical Fitness, Absenteeism, and Work Performance." Canadien Journal of Public Health, 68(3): 201-203, May-June, 1977.

Fentem, P. H. "Exercise: A Prescription for Health?" British Journal of Sports Medicine, 12: 223-226, 1979.

Folkins, C. H. Effects of Physical Training on Mood." Journal of Clinical Psychology, 32 (2): 385-388, 1976.

Folkins, C. H. and W. E. Sime "Physical Fitness Training and Mental Health." American Psychologist, 36(4): 373-89, April, 1981.

Girdano, Daniel, and George Everly. Controlling Stress and Tension: A Holistic Approach. Englewood Cliffs, NJ: Prentice-Hall, 1979.

Girtin, B. "Effect of Increases in Physical Fitnesses on Mental Ability Following Physical and Mental Stress." Research Quarterly, 37: 211-220, 1966.

BIBLIOGRAPHY

Graham-Bonnalie, F. E. The Doctor's Guide to Living With Stress. New York: Drake Publisherss Inc., 1972.

Hammett, V. B. O. "Psychological Changes with Physical Fitness Training." Canadien Medical Association Journal, 96: 764-767, March 25, 1967.

Ismail, A. H., and R. John Young. "Effect of Chronic Exercise on the Personality of Adults." Annals of the New York Academy of Sciences, 31: 958-969, 1977.

Jones, R. D. "Running of Self-Therapy." Journal of Sports Medicine and Physical Fitness, 19(4): 397-404, December, 1979.

Leon, L. S. "Psychological Effects of Jogging: A Preliminary Study." Perceptual and Motor Skills, 47(3): 1215-1218, 1978.

McPhereson, et. al. "Psychological Effects of an Exercise Program for Post Infarc and Normal Adult Men." Journal of Sports Medicine and Physical Fitness, 7(2): 95-102, 1967.

Michael, E. D., Jr. "Stress Adaptation Through Exercise." Research Quarterly, 28: 50-54, 1957.

Schuldt, Larry. "Relationship of Job Performance to Exercise." Unpublished Thesis, Eastern Illinois University, Charleston, Illinois, 1982.

Smith, Alice, and Susan Hanket Brandt. "Physical Activity: A Tool in Promoting Mental Health." Journal of Psychiatric Nursing and Mental Health Services, 17(11): 24-25, November, 1979.

Wilson, V. E. "Mood Profiles of Marathon Runners, Joggers and Non-Exercisers." Perceptual Motor Skills, 50(1): 117-118, February, 1980.

APPENDIX A

TOTAL RAW SCORES OF EXERCISING AND SEDENTARY SUBJECTS

EXERCISING SUBJECTS				SEDENTARY SUBJECTS	
SUBJECT #	SCORE	SUBJECT #	SCORE	SUBJECT #	SCORE
E_1	12	E_{21}	4	S_1	39
E_2	16	E_{22}	13	S_2	50
E_3	10	E_{23}	17	S_3	27
E_4	8	E_{24}	37	S_4	45
E_5	16	E_{25}	25	S_5	30
E_6	11	E_{26}	7	S_6	21
E_7	10	E_{27}	5	S_7	28
E_8	26	E_{28}	5	S_8	23
E_9	14	E_{29}	33	S_9	15
E_{10}	32	E_{30}	18	S_{10}	39
E_{11}	33	E_{31}	27	S_{11}	26
E_{12}	25	E_{32}	15	S_{12}	25
E_{13}	13				
E_{14}	14				
E_{15}	10				
E_{16}	13				
E_{17}	5				
E_{18}	3				
E_{19}	23				
E_{20}	20				

VITA

Michael J. Hanley was born in New Rochelle, New York on April 20, 1960. The high school diploma was received from Red Hook Central High School, Red Hook, New York. His undergraduate education was received at East Carolina University, Greenville, North Carolina, where he received the Bachelor of Science degree in School and Community Health with concentration in Athletic Training in 1982. His graduate education was received at Eastern Illinois University, Charleston, Illinois, where he will receive the degree of Master of Science in Physical Education in 1986. He held teaching and athletic training assignments in Dayton, Ohio while completing requirements for the Master of Science degree. He is currently employed as a teacher and athletic trainer for the Huber Heights School District, Dayton, Ohio.