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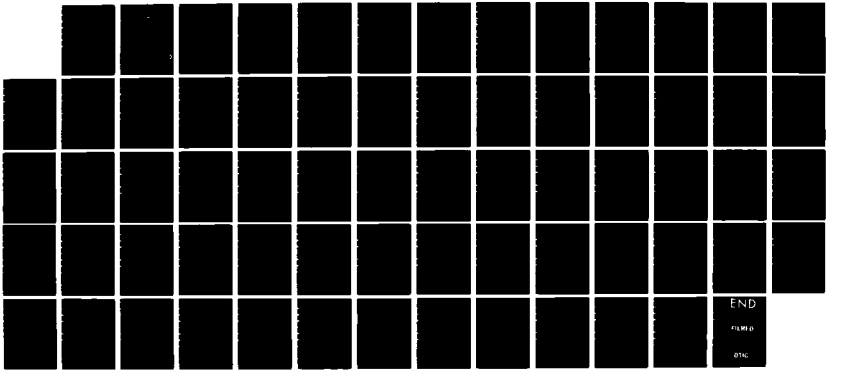

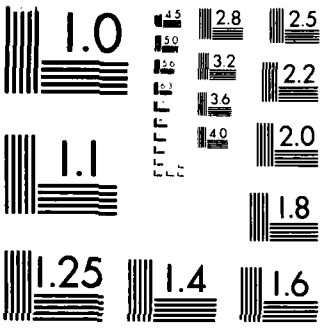

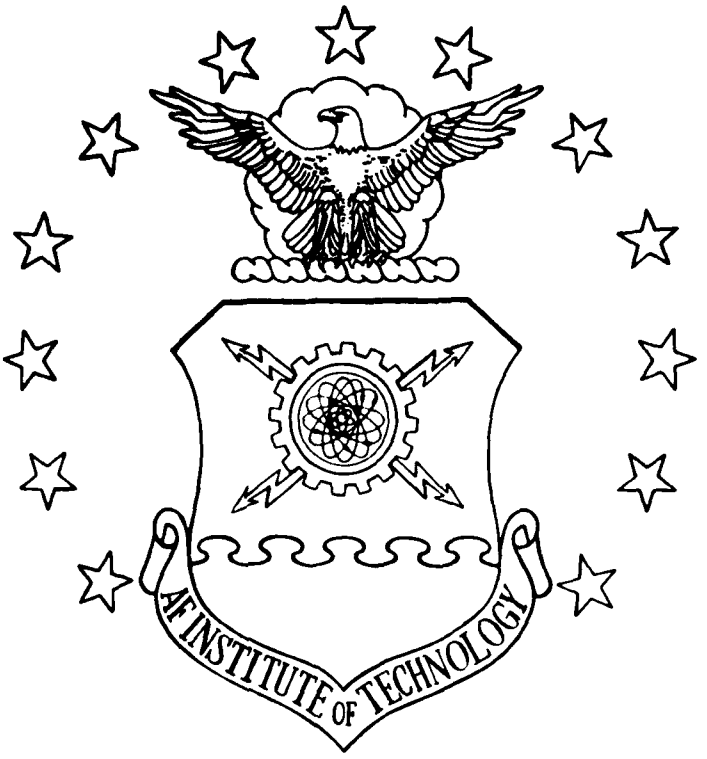

AN INVESTIGATION INTO EFFECTS OF ENVIRONMENTAL CHANGES ON LOCUS OF CONTROL

THESIS

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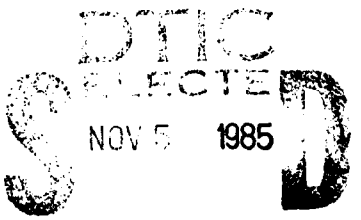

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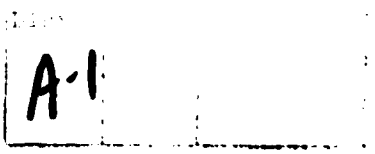

AFIT/GLM/LSB/85S-2

AN INVESTIGATION INTO EFFECTS OF ENVIRONMENTAL CHANGES ON LOCUS OF CONTROL

THESIS

Presented to the Faculty of the School of Systems and Logistics
of the Air Force Institute of Technology
Air University
In Partial Fulfillment of the
Requirements for the Degree of
Master of Science in Logistics Management

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September 1985

Preface

This thesis investigated the effect of structural changes in the environment on individuals. As military decision makers, it is vital we are aware of these types of effects and their results, not only on our own decisions but on those who work for us and with us. I would like to thank Major John Stribavy, my reader, for his efforts on this thesis.

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Abstract

Past research suggests that relationships exist between Type A personality, stress, and coronary heart disease. This investigation determined that Type A individuals are inclined to experience more stress than Type B individuals in similar situations. A relationship was found between Type A behavior and internal locus of control indicating that individuals with internal locus of control are more likely to be Type A personalities than Type B personalities. Relationships were also found among Type A behavior, internal locus of control, and assertiveness indicating that Type A individuals are more assertive than Type B individuals. Family inventory was inversely related to locus of control inferring that internal locus of control individuals are more satisfied with their personal relationships than are external locus of control individuals. Because family inventory was also inversely related to stress, when stress is present in one area of an internal locus of control individual's life, the individual looks to other areas of their life for satisfaction. No relationship was found between stress and assertiveness indicating that assertive individuals deal more effectively with stressful situations. This investigation also determined that as the

environment changes to a more structured rigid environment, the individual shifts from an internal to an external locus of control. These determinations were based on statistical analysis using Pearson Correlations, Paired t-Tests, and Regression Analysis.

AN INVESTIGATION INTO EFFECTS OF ENVIRONMENTAL CHANGES ON LOCUS OF CONTROL

I. Literature Review

Introduction

Nearly one-third of all American deaths can be attributed to coronary heart disease (CHD). In fact, over 700,000 Americans die prematurely each year from the effects of CHD. An article on stress management in a recent Air Force publication states that some physicians claim "up to 80 percent of all patients in hospitals are there because of stress-related illnesses" (1:18). Organizational managers are realizing the impact of stress on workers and productivity. Since the beginning of the twentieth century, researchers have linked stress to CHD. Research has shown that a relationship exists between Type A behavior pattern, stress, and coronary heart disease. However, little or no research has been done concerning recovery rates (return to normal state) on long-term verses short-term stressors.

Definition of Coronary Heart Disease

Coronary Heart Disease is a physiological disorder with three variations:

1. Coronary artery disease--hardening of the

arteries to the heart causing loss of blood flow.

2. Arteriosclerosis--hardening of all the arteries.

3. Ischemic heart disease--loss of oxygen to the heart.

CHD is manifested by two main conditions:

1. Angina pectoris--chest pain resulting from an insufficient supply of oxygen to the heart muscle caused by the blockage of one or more coronary arteries.

2. Myocardial infarction--heart attack resulting from an insufficient supply of oxygen to the heart muscle over an extended period of time.

Definition of Type A and Type B Behavior Patterns

Type A behavior pattern is characterized by excessive competitive achievement striving, exaggerated sense of time urgency, inability to relax without guilt, and aggression/hostility (10:627-637; 13:688-699; 15:820-821).

Opposite to Type A behavior is Type B behavior. Type B individuals are characterized by the ability to pursue leisure activities, patience, and the ability to relax (10:627-637; 13:688-699; 15:820-821).

Definition of Locus of Control

The concept of locus of control involves the perception of being able to predict and control events in

the environment. Two possibilities exist: external or internal locus of control. Individuals with external locus of control believe in chance, luck, and fate. They do not perceive themselves as responsible for what happens to them. For example, they believe their promotion was a result of being in the right place at the right time. Individuals with internal locus of control, on the other hand, do not believe in chance, luck or fate. They believe they are responsible for events in the their lives. For example, they believe hard work leads to promotion, advancement, etc. and failure to be promoted is because they did not work hard enough (7:3-8).

Definition of Stress

There is no clear cut definition of stress among researchers primarily because stress research encompasses several disciplines. For the purpose of this thesis, stress is defined as the condition, real or perceived, that disrupts the body's state of physiological and/or psychological equilibrium (6:5-9).

Type A and Type B Behavior Patterns. Two researchers, Rosenman and Friedman, are credited with the development of the Type A and Type B behavior hypotheses. As early as the 1890s, physicians had characterized "coronary prone" patients by their overt behavior. Two psychiatrists, Menninger and Dunbar, "observed that coronary heart disease patients were hard driving and goal directed

people who also frequently exhibited an aggressive personality" (16:133). It should be noted that there is a significant difference between Type A behavior and stress. C. David Jenkins, a researcher in Type A behavior, stated that Type A behavior "is neither a stressor situation nor a distressed response. It is rather . . . a style of overt behavior which some people confront life situations with [sic]" (16:133).

Type A behavior has been linked to CHD by numerous studies. A 1960 study rated 3,400 men, aged 39 to 59, as Type A or Type B from interview data. At the start of the study, all were free of CHD. Within two and one-half years, 70 had developed CHD. Of these 70, 54 had been initially identified as Type A behavior patterns. In the final report published in 1975, 257 of the original participants developed CHD. The results indicated Type A individuals to be twice as likely to develop CHD as Type B individuals (16:133-134).

Studies have also been done on Type A behavior patterns and performance under stress. In 1976, Carver, Colman, and Glass found that when given a strenuous task such as a treadmill, Type As worked harder than Type Bs but reported fewer symptoms of fatigue. Even though Type As were experiencing the same amount of fatigue as Type Bs, they did not report it in order to continue working on the task at a high level of exertion. If Type As acknowledged

their fatigue, it would interfere with their successful completion of the task. By not paying attention to the symptoms of fatigue they were able to facilitate their performance (14:1369).

A similar study done in 1978 by Weidner and Matthews dealt with interference with task performance. They hypothesized that a variety of symptoms could interfere with task performance but that Type A individuals might not report the symptoms until the task was completed. The results of their experiment indicated that when Type As were working on a task they expected to continue, they reported fewer symptoms than did Type Bs. This occurred even though Type As and Type Bs did not differ in the symptoms they reported if they thought the task was completed. Weidner and Matthews concluded that Type As were less likely to report the presence of symptoms that could interfere with task performance than were Type Bs, but only when the symptoms had the potential to interfere with task completion (14:1369).

However, not all Type As react to stress in the same manner. A study done by Smith and Sheridan showed that not all Type As appear to be threatened by uncontrollability of a situation and that some Type As are even likely to report symptoms of stress. The differences in reporting stress symptoms occurred between males and females. Type A males, especially those who are hurried and impatient, are far more

likely to report physical stress reactions. These same Type A males are more likely to worry about such things as information overload or complexity, and uncertainty, and are likely to blame themselves for their misfortune (12:545-546). In contrast, Type A females are generally no more likely than other females to report symptoms of stress. Smith and Sheridan felt that Type A females report little cognitive stress because they blame external factors, i.e., society or fate, for their misfortunes whereas Type A males are more likely to blame themselves (12:545-546). This same study showed that Type As who are hard-driving, competitive, and job-involved are less likely to recall fatigue and other physical stress reactions that are perceived as socially undesirable for their sex (12:545-546).

Research done by Matthews and Siegal suggests that at some point in their development, "Type As learn to value productivity and, at the same time, fail to acquire clear standards of acceptable performance" (11:662). These two factors may be the cause of many of the Type A behavior characteristics such as excessive achievement striving.

An investigation into Type A behavior and achievement striving was done by Wolf and Kissling. They sampled first year medical students to determine if Type A behavior would increase over the first year of medical school. The researchers predicted that Type A behavior would be positively related to measures of academic

achievement. However, their results indicated that Type A behavior decreased significantly over the first year of medical school. Wolf and Kissling believed that, in view of the extreme environmental demands on first year medical students, the students learn to adapt to a stressful environment through "a style of coping that does not involve overstriving, over-driving, and struggling to achieve and maintain unrealistically high goals and environmental control" (17:820-821).

Studies have shown that Type As tendency to see themselves as the cause of their behavior and the subsequent outcome contributes to their increased sensitivity to threats to control. It has been shown that if a behavioral freedom is blocked or coerced, Type As perceive a greater threat and exhibit a stronger reactance response than will Type Bs (11:663). It has also been shown that

> . . . in situations in which there is even slight ambiguity about the cause of the behavior, Type As will be more likely than Type Bs to attribute causality to factors under their control" (11:663).

Locus of Control. Research has been conducted concerning lack of control in situations. In 1971, Straub, Tursky, and Schwartz found differences in reaction to electrical shock by individuals who could control the administration and level of intensity of the shock than those who had no control over the shock. Individuals who had control reported less discomfort at similar intensity

levels than did individuals who had no control over the shock. Those individuals in control were also able to endure the electrical shock for longer periods than were those individuals who had no control. However, on a second administration of the electrical shock in which neither group had control, although no difference was found in the group who had no control in the first trial, there was significant difference in the group who had previously had control. This group exhibited reduced tolerance to the intensity and length of the shock (13:157-162).

Hokanson, et al. investigated the relationship between control, or lack of control, and stress in a study conducted in 1971 using electrical shock. Volunteers were paired by resting systolic pressure with one member of the pair having control over rest periods from the shock. The researchers found those individuals with control had lower systolic pressure than their counterparts who had no control over the rest periods (5:60-68).

In a more recent study, Strube and Werner investigated the relationship between relinquishment of control and Type A behavior pattern. They hypothesized that a Type A individual would be less willing to give up control over a situation than would a Type B individual. Their finding supported this hypothesis. In performance trials in which a Type A was partnered with a Type B individual, the Type A individual was less willing to relinquish control

than was the Type B individual, even though previous performance of the Type B individual had been rated equal or superior to the Type A individual (15:688-701).

Stress. The term stress was first used in a physiologic sense in 1914 by Walter Cannon. His perception of stress involved both physical and emotional stimuli.

> The chance of gaining insight into the strength and endurance of stabilizing factors of the organism and thus its ability to resist the operation of disturbing forces makes it worthwhile to inquire where the limits lie beyond which stresses overwhelmed these corrective factors and alter the steady state of the organism [16:128].

Cannon's studies dealt with catecholamine release into the blood stream to prepare for the "fight or flight" response.

After 1946, the term "stress" became popular as the result of the work of Hans Selye. In 1974, he published a book entitled Stress Without Distress in which he delineates stress and what he calls distress. Selye equates the stress described by Cannon in 1914 with "an athlete competing to stay ahead or the parachutist keeping steady at the moment of the jump." Selye viewed these nerve exciting events as "joyous excitement." They are associated with many things and need not be avoided. In contrast to these stimuli are those Seyle labeled as distress. He associated distress with deprivation and an unfulfilled need for achievement. It is distressing he says, "to have perceived oneself as having failed" (16:129). Nonetheless, prolonged periods of either stress and/or distress can be detrimental to the

organism's health. Most recently, the term stress has come to denote both stress and distress by researchers.

Stress and Coronary Heart Disease. Research done linking stress and CHD in animals was done in the late 1960s by H. L. Radcliffe. His study showed an increase in coronary artery disease in a population of zoo birds from 1 percent in 1948 to over 10 percent in 1968. Diet and the mean age of the birds at death were the same and could not account for the increase. However, around 1950, the zoo began artificially assembling family groupings. Radcliffe believed this artificial grouping resulted in "conflicts, breeding failures and abnormal behavior within the family group" resulting in an increase in coronary artery disease (16:130).

In a later experiment, Radcliffe examined the effects on swine of separation after social bonds had been formed. Both control and test groups responded to "human care hands" with normal grunts and squeals for a handout. However, "the separated animals showed an increased incidence, extent, and severity of coronary atherosclerosis" (16:130).

CHD, as mentioned earlier, is responsible for over one-third of all American deaths. It is an accepted belief in the medical field that certain factors can be associated with increased risk of CHD (3:1031; 4:283-284). There are three types of these risk factors:

possibility of shifts in an individual's locus of control as shifts in the environment occur. This thesis attempted to discern if an individual's locus of control shifts from internal to external when an individual is placed in an externally controlled environment.

This research was designed to answer the following questions:

1. Is there a difference in the stress level of individuals exposed to long-term stressors as opposed to individuals exposed to a stressor for short periods?

2. When the long-term stressor is removed, is there an increase in the time required to return to the normal state for the individual?

3. Is there a shift in locus of control as a result of a shift in the amount of control the individual has over the environment?

1. Primary risk factors. These factors contribute directly to CHD. Some primary risk factors are high concentrations of low-density lipoproteins, low concentrations of high-density lipoproteins, hypertension and smoking.

2. Secondary risk factors. These are factors that influence the primary risk factors. Obesity, genetic predisposition, and excessive dietary sodium levels are all examples of secondary risk factors.

3. Tertiary risk factors. These factors do not cause CHD but are helpful in identifying individuals with increased risk. Tertiary risk factors include baldness, and ear lobe creases (4:283-284).

Research Questions

This review suggests that a clear relationship exists between Type A behavior, stress, and coronary heart disease (CHD). However, there is little research concerning differences in recovery rates (return to the normal state) when a long-term stressor is removed. This thesis investigated the stress levels and recovery rates of individuals exposed to long-term stressors. Since there is no clear cut definition of what signifies a long-term stressor, for the purpose of this thesis, a long-term stressor is defined as a stressor that is continuously present for at least one week. A short-term stressor is defined as brief and non-continuous.

Also, little research has been conducted on the

II. Methodology

This thesis investigated the stress levels and recovery rates of individuals exposed to long-term stressors and possible shifts in locus of control due to environmental changes. To accomplish this, a sample of a population exposed to a long-term stressor was surveyed twice; once during the presence of a long-term and a short-term stressor, and again after the short-term stressor was removed. This same population was surveyed on their perceived beliefs prior to and while exposed to a structured environment.

The population used for this research was the population of students enrolled in the master's degree program at the Air Force Institute of Technology (AFIT), Wright-Patterson Air Force Base, Ohio. The program was a full-time, 15 month master's degree requiring a thesis. It was a very structured environment and was selected for several reasons; first, because it contained both a long-term stressor (the entire program) and short-term stressors (final examination periods); second, because it was a very structured environment; and third because the population was readily accessible to the researcher.

Students selected for admission to the AFIT program were officers and/or civilian equivalents with prior work experience within the Department of Defense (DOD) in middle

management areas indicating they exercised a certain degree of freedom within their work environment. The fact that the population came from an unstructured environment was a prerequisite because this thesis investigated the effect on an individual's locus of control when the environment changed from an unstructured environment (DOD) to a structured environment (AFIT).

Volunteers were solicited from the AFIT population for participation. Ninety-seven officers and civilian volunteers responded to the first survey but only 81 responded to the second survey. As a consequence, the data used for this thesis contained only the responses from the 81 individuals who completed both surveys. The 16 respondents who did not complete the second survey were eliminated from the first set of survey data prior to analysis.

The students were surveyed twice: (1) during the presence of the long-term stressor and a short-term stressor, and (2) after the short-term stressor had been removed. The actual administration of the survey was during final examinations 11 months after the start of the AFIT program and then again when the examinations were completed and the students were on break before the start of the next term. Due to time limitations, the entire 15 month program could not be measured for recovery from long-term stress. Instead, changes in stress levels were measured.

The survey used was adapted from the Stress Assessment Package (2:64-68; 8:37-44). The portions of the Stress Assessment Package used were those designed to measure (1) perceived productivity; (2) certain individual character traits; and (3) perceived stress. The questionnaire was divided into six sections with two of the sections further divided into two or three subsections. An abbreviated version of the questionnaire was used for the first survey. Questions eliminated were from areas in which it was not necessary to measure any change in response or questions in which no change in response was anticipated, such as demographics. Questionnaires I and II are included as Appendices A and B.

Section 1, Personal Beliefs. This section was used to measure the degree to which each participant was either an internal or an external locus of control. The section was divided into three parts. Part I used seven questions to measure overall locus of control. Part II and Part III used five questions each to measure any shift in locus of control since attending the AFIT program. These questions were developed specifically for this study by the researcher from the locus of control questions used in Part I. Pre-testing was not done because the questions were identical to the original locus of control questions. The resulting reliabilities for Part II and Part II were 0.53 and 0.65, respectively.

Section 2, Personal Attributes. This section was divided into two parts to measure Type A versus Type B behavior patterns. The first section consisted of six question and the second section consisted of nine questions.

Section 3, Assertiveness Inventory. Five questions were used to measure each participant's level of assertiveness.

Section 4, Perceived Stress. This section consisted of seven questions designed to measure each participant's stress level.

Section 5, Family Inventory. This section used five questions to measure the amount of family problems each individual was encountering that could affect their stress level.

Section 6, Background Information. Demographics, exercise, smoking and stress-related illnesses were measured in this section using 11 questions.

Statistical Analysis

Statistical analysis of the data was performed on the Harris computer using the Statistical Package for the Social Sciences (SPSS) (9). Three types of statistical tests were performed; Pearson Correlations, stepwise regression, and paired t-test.

Pearson Correlations and reliability coefficients were performed on scaled sections of Questionnaires I and II to determine the degree to which the resulting 12 variables

were linearly correlated.

Two separate stepwise regressions were run. In both regressions, the dependent variable was identified as Stress and the remaining variables were the independent variables. The first regression was run on the data from the first survey. The resulting independent variables were Locus of Control, and both measures of Type A versus Type B Behavior Pattern. The second regression was run on the data from the second survey and the resulting independent variables were Locus of Control, Pre-AFIT Locus of Control, Locus of Control During AFIT, both measures of Type A versus Type B Behavior Pattern, Family Inventory, and Assertiveness.

Three paired t-tests were performed to determine if there was any statistical difference between the means;

1. The first scaled variables to be paired were Locus of Control from the first survey and Locus of Control from the second survey.

2. The second t-test paired the scaled variable Stress from the first survey with the scaled variable Stress from the second survey.

3. The final t-test performed paired the scaled variables Pre-AFIT Locus of Control with Locus of Control During AFIT.

III. Analysis

This chapter presents and discusses the results of the statistical analysis performed using the Harris computer and the Statistical Package for the Social Sciences (SPSS).

Pearson Correlation

Questionnaires I and II were scaled by section and subsection to yield 12 variables, 4 from Questionnaire I and 8 from Questionnaire II. Pearson correlations and reliability coefficients were performed on each variable. Resulting correlations are presented as Appendices C and D. Reliability coefficients are presented next by variable and summarized in Table I.

Variables 1 and 5, Locus of Control. Questions 1 through 7 of Questionnaire I and II were used to obtain a scale with an alpha = 0.71 during the stress period and 0.82 after the stressor had been removed.

Variables 2 and 8, 3 and 9, Type A and Type B Behavior Patterns. Questions 8 through 13 of Questionnaire I and questions 18 through 23 of Questionnaire II were used to obtain Variable 2 and Variable 8 with alphas of 0.60 and 0.64 respectively. Questions 14 through 22 of Questionnaire I and questions 24 through 32 of Questionnaire II were used to obtain a second scale for Type A and B behavior patterns. The resulting alpha value for Variable 3 was 0.81 and the

resulting alpha value for Variable 9 was Ø.83.

Variables 4 and 11, Stress. The alpha values obtained for Variable 4 was Ø.64 and for Variable 11 was Ø.65. These values were obtained by scaling questions 23 through 29 in Questionnaire I and questions 38 to 44 in Questionnaire II respectively.

Variables 6 and 7, Locus of Control, Before and During AFIT. Questions 8 through 12 of Questionnaire II were used to obtain a Pre-AFIT Locus of Control alpha = Ø.53. The same five questions used to measure Locus of Control while attending the AFIT program resulted in an alpha = Ø.65. These questions were numbered 13 through 17 of Questionnaire II.

Variable 12, Family Inventory. Questions 45 through 49 from Questionnaire II were scaled to obtain an alpha value for Variable 12 of Ø.94.

Reliability coefficients are summarized in Table I.

Stepwise Regression

A stepwise regression was performed on the data from the first survey. The dependent variable was Stress and the independent variables were Locus of Control, and both variables to measure Type A versus Type B Behavior Pattern. Only one variable entered the regression equation, Variable 3, Type A versus Type B Behavior Pattern, with a resultant r square value of Ø.12.

A stepwise regression was also performed on the data

TABLE I

COEFFICIENTS

VARIABLE	RELIABILITY COEFFICIENT
V1 - Locus of Control	Ø.71
V2 - Type A versus Type B	Ø.6Ø
V3 - Type A versus Type B	Ø.81
V4 - Stress	Ø.64
V5 - Locus of Control	Ø.82
V6 - Pre-AFIT Locus of Control	Ø.53
V7 - During AFIT Locus of Control	Ø.65
V8 - Type A versus Type B	Ø.64
V9 - Type A versus Type B	Ø.83
V1Ø - Assertiveness	Ø.83
V11 - Stress	Ø.65
V12 - Family Inventory	Ø.94

from the second survey. As with the first stepwise regression, the dependent variable was Stress. The independent variables were Locus of Control, Pre-AFIT Locus of Control, Locus of Control During AFIT, both variables to measure Type A versus Type B Behavior Pattern, Family Inventory, and Assertiveness. Three variables entered the regression equation. The first to enter was Variable 9, Type A versus Type B Behavior Pattern, with a r square value of Ø.13. The second variable to enter was Family Inventory raising r square to Ø.19. The third and final variable to enter the regression equation was Pre-AFIT Locus of Control yielding a r square value for the regression of Ø.24.

Paired t-Test

Three paired t-tests were performed on the available data. The first t-test paired the variable Locus of Control from the first survey with the variable Locus of Control from the second survey. The resulting correlation was Ø.73 with a -Ø.46 t-value and a two-tail probability of Ø.65.

The second t-test performed paired the variable Stress from the first survey with the variable Stress from the second survey. The correlation value obtained was Ø.81 with a Ø.64 t-value and a two-tail probability of Ø.52 indicating there was no statistical difference between the two variables.

The final t-test performed paired the variables Pre-AFIT Locus of Control and Locus of Control during AFIT. The

resulting correlation value was Ø.81 with a 2.3Ø t-value and a significant two-tail probability of Ø.Ø2.

Correlation and t-values for the three t-tests are summarized in Table II.

TABLE II

PAIRED t-VALUES

Variables	Correlation	t-value	2-Tail Probability
V1 with V6	Ø.73	-Ø.46	Ø.65
V4 with V12	Ø.81	Ø.64	Ø.52
V7 with V8	Ø.81	2.3Ø	Ø.Ø2

IV. Discussion

The intention of this thesis was to investigate the possibility of differences in recovery rates when long-term, as opposed to short-term, stressors were removed. In addition, the intention was to determine if the recovery rates increased in relation to increased periods of stress. The final research question examined what effect a change in environment would have on an individual's locus of control. However, due to unforseen time constraints, the first two research questions dealing with long-term stressors could not be properly investigated. As a consequence, only data on the final research question dealing with shifts in locus of control was adequately analyzed.

Locus of Control

The analysis of the data supported the research hypothesis that there is a shift in locus of control as a result of a lack of control in the individual's environment. The results of the paired t-test were significant at the 0.025 level with 80 degrees of freedom. It should be noted that this may not be an actual shift but only a perceived shift in locus of control. However, even if there was not an actual shift in locus of control it is significant that the individual would perceive this shift. As control over environmental conditions lessens, the individual shifts from

an internal to a more external locus of control. The perceived change in locus of control appeared to modify the amount of stress the individual experienced because the variable Pre-AFIT Locus of Control entered the regression equation as a predictor of stress. Therefore, the more control individuals perceived as having over the environment originally, the more stress they experienced as they began to lose control over the environment.

The results of the second and third paired t-tests showed no statistical difference between the means of the two paired variables. In the second paired t-test, when Stress from the first survey was paired with Stress from the second survey, there was no statistical difference between their means indicating there was no statistical difference in the individual's stress level. This may be a result of the individual perceiving no change in the amount of stressor present. It may also be the result of the presence of a different stressor during the second survey measurement. Another possible explanation for the stress level to remain the same is that the time period between survey administrations was insufficient for recovery to the normal state to occur.

The third t-test indicated there was no statistical difference between the variables Locus of Control from the first survey and Locus of Control from the second survey. This was expected since there was little change in the

environment from the first survey administration to the second survey administration.

Correlations were found between Stress and Type A Behavior Pattern in the first and second surveys. A relationship was also found between Stress and Type A Behavior Pattern in both regression analyses. This would indicate that Stress and Type A behavior are positively related. This is consistent with findings of previous researchers that a relationship exists between Type A individuals and stress (reference pages 3-7).

All three Locus of Control variables were highly correlated to each other in the second survey indicating a strong linear relationship among the three variables. This was anticipated since all three are measuring the same variable but at different times and because all measures had acceptable reliabilities.

Both personality type variables were highly correlated with each other in both surveys. These same two variables were also correlated to the variables Locus of Control During AFIT and Assertiveness indicating there are linear relationships between Type A behavior and internal locus of control as well as between Type A behavior and assertiveness. Family Inventory was negatively correlated with all three measures of Locus of Control and negatively correlated with Stress.

Recommendations

1. Due to problems encountered in completing this research, future AFIT research efforts should concentrate on short-term stressors.

2. Since the results of this research did not agree with the results of Wolf and Kissling (17:820-821), further research should be conducted in the area of behavior modification when long-term stressors are present.

A. Because Wolf and Kissling only examined the effects of long-term stress on personality type, additional research should be conducted into the effects of long-term stress on locus of control.

B. This research did not find a change in personality type from Type A to Type B but did find a change in locus of control. The difference in findings between this research and that of Wolf and Kissling may be the result of the difference in the length of the stressors used. Wolf and Kissling used first year medical students and this researcher used master's degree students. Research should be conducted to determine if the length of the stressor affects the personality variable which is modified.

C. Research should also be directed to determine if, after the stressor is removed, the modification which occurred in the personality variable reverses itself.

Conclusion

This thesis examined the effects of the presence of long-term and short-term stressors. Linear relationships were found between stress levels and the Type A behavior pattern indicating a relationship between the level of stress and personality type. The results showed that Type A individuals are inclined to experience more stress than are Type B individuals in similar situations. It should be noted that the population used consisted primarily of Type A males. This is significant with regard to research done by Smith and Sheridan (12:545-546) on differences in reaction of Type A males versus Type A females to stress.

Linear relationships were also found between internal locus of control and Type A behavior indicating individuals with internal locus of control are more likely to be Type A personalities than Type B personalities. Since internal locus of control individuals see themselves as responsible for events in their lives, they are more likely to be aggressive, competitive, achievement striving Type A individuals.

Since linear relationships were also found among Type A behavior, internal locus of control, and assertiveness, it can be inferred that Type A individuals, because they perceive themselves as responsible for events in their lives, will be more assertive than Type B individuals in achieving their goals.

Family inventory was inversely related to locus of control indicating that internal locus of control individuals are more satisfied with their personal relationships. Family inventory was also inversely related to stress. From these two relationships, it can be inferred that when stress is present in one area of an internal locus of control individual's life, the individual looks to other areas of their life for satisfaction.

A relationship was not found between stress levels and assertiveness indicating there was no correlation between the two variables. This supported a research finding by Lieutenant Colonel Raymond G. Troxler, MD (Fye and Staton). He felt that assertive individuals deal more effectively with stressful situations by responding immediately to stressors rather than allowing them to accumulate to a degree that could result in psychological and/or physiological harm (2:42).

Statistical analysis showed that as the environment became more structured, there was a corresponding shift in locus of control from internal to external. This was the most significant finding of this research and indicated that the less control individuals have over events in their environment, the less inclined they are to accept responsibility for what happens to them.

Appendix A: Questionnaire I

STRESS MEASUREMENT QUESTIONNAIRE

The Stress Measurement Questionnaire (SMQ) is a tool designed to aid in measuring your personal stress level and determine some of the original components that may contribute to stress.

It is important that you answer all items honestly. This is the only way an accurate stress measurement can be made.

Your individual responses will be held in the strictest confidence and will not be provided to any person or organization. Only those individuals directly involved in this thesis will have access to your complete SMQ, however, there will be no way to identify the persons by name who complete the SMQ.

INSTRUCTIONS

This questionnaire contains 34 items (individual "questions"). All items must be answered by filling in the appropriate spaces on the computer-scored response sheet provided. If for any item you do not find a response that fits your situation exactly, use the one that is the closest to the way you feel.

Please use a soft-lead (No. 2) pencil, and observe the following:

1. Make heavy black marks that fill the space of the response you select.

2. Erase cleanly any response you wish to change.

3. Make no stray markings of any kind on the response sheet.

4. Do not fold, staple, or tear the response sheet.

PRIVACY ACT STATEMENT

In accordance with paragraph 8, AFR 12-35, the following information is provided by the Privacy Act of 1974:

a. Authority

(1) 5 U.S.C. 301, Departmental Regulations, and/or

(2) 10 U.S.C. 8012, Secretary of the Air Force, Powers, Duties, Delegation by Compensation, and/or

(3) DOD Instruction 1100.13, 17 Apr 68, Surveys of Department of Defense Personnel, and/or

(4) AFR 30-23, 22 Sep 76, Air Force Personnel Survey Program.

b. Principal Purpose. The survey is being conducted to collect information to be used in research aimed at illuminating and providing inputs to the solution of problems of interest to the Air Force and/or DOD.

c. Routine Uses. The survey data will be converted to information for use in research of management related problems. Results of the research, based on data provided, will be included in a master's thesis and may also be included in published articles, reports, or texts. Distribution of the results of the research, based on the survey data, whether in written form or presented orally, will be unlimited.

d. Participation in this survey is entirely voluntary.

Personal Beliefs

Part I

This portion of the questionnaire relates to the way in which certain important events in our society affect different people. Each of the five items consists of a pair of alternatives labeled A or B. Using the scale below, indicate which statement most closely follows your own beliefs and record it on your answer sheet.

1 = I strongly agree more with statement A
2 = I moderately agree more with statement A
3 = I slightly agree more with statement A
4 = I slightly agree more with statement B
5 = I moderately agree more with statement B
6 = I strongly agree more with statement B

1. A Becoming a success is a matter of hard work; luck has little or nothing to do with it.
   B Getting a good job depends mainly on being in the right place at the right time.

2. A Getting people to do the right thing depends on ability; luck has little or nothing to do with it.
   B Who gets to be the boss often depends on who was lucky enough to be in the right place first.

3. A There is really no such thing as luck.
   B Most people don't realize the extent to which their lives are controlled by accidental happenings.

4. A It is impossible for me to believe that chance or luck plays an important role in my life.
   B Many times I feel that I have little influence over the things that happen to me.

5. A What happens to me is my own doing.
   B Sometimes I feel that I don't have enough control over the direction my life is taking.

6. A Usually people get the respect they deserve in this world.
   B An individual's worth often passes unrecognized no matter how hard he/she tries.

7. A The ideas that teachers are unfair to students is nonsense.
   B Most students don't realize the extent to which their grades are influenced by accidental happenings.

Personal Attributes

Part I

The next set of questions is concerned with your personal attributes. Each item consists of five alternatives. Select the alternative that that is the most descriptive of you as an individual.

8. 1 Winning is everything; my satisfaction comes from winning.
   2 I like winning any game or event, and am very disappointed when I lose.
   3 I like winning any game or event, and am somewhat disappointed when I lose.
   4 I like winning any game or event, but I equally enjoy interaction and participation.
   5 I enjoy the social interaction and participation that comes with a game or event, and losing does not bother me at all.

9. 1 I do my very best when I'm fighting a tight deadline.
   2 I seem to do my best work when I have a reasonable deadline to meet.
   3 I work equally well whether I have a deadline to meet or not.
   4 Although I perform adequately with a deadline to meet,
   I prefer to not meet a deadline.
   5 I do not like deadlines; I do my best work when I'm not hurried in any manner.

10. 1 I hate to wait on anything or anybody.
    2 I do not enjoy waiting but I will if I absolutely have to.
    3 Although I really don't enjoy waiting, I don't mind if I don't have to wait too long.
    4 I don't mind waiting; there are many situations where one must wait.
    5 Waiting on something or someone is a pleasant opportunity to relax.

11. 1 I am always in a rush, even when I don't have to be.
    2 Most of the time I'm in a hurry, even when I don't have to be.
    3 I occasionally find myself in a hurry, even though most of the time I don't have to.
    4 I seldom hurry myself; only when I have to.
    5 I will not hurry myself, even when I know I'm late.

12. 1 I always try to do too much, as a result I always feel tired.
    2 I frequently try to do too much, and as a result I feel tired most of the time.
    3 On rare occasions I find myself trying to do too much; when these occasions arise, I slow down.
    4 I pace myself in accomplishing tasks so that they are all accomplished with the minimum amount of fatigue.
    5 I will not overextend myself, even if it means not getting something done.

13. 1 I set very high work standards for myself, and get very upset when I don't meet them.
    2 I set high work standards, and get upset when I don't meet them.
    3 I set my own work standards, and it bothers me somewhat if I don't meet them.
    4 I set work standards for myself, and it bothers me to a little extent if I don't meet them.
    5 I maintain work standards that I can make without over-extending myself, and I do not get upset if I occasionally fail.

Part II

Indicate your agreement with the statement by selecting the response which best represents your attitude concerning your personal attributes.

1 = Strongly disagree
2 = Moderately disagree
3 = Slightly disagree
4 = Neither agree nor disagree
5 = Slightly agree
6 = Moderately agree
7 = Strongly agree

14. I like winning any game or event, and am very disappointed if I lose.

15. I hate to wait on anything or anybody.

16. I am frequently in a hurry, even when I don't have to be.

17. I frequently get upset with people, but I usually do not show it.

18. I set high work standards for myself, and get upset when I don't meet them.

19. I frequently try to do too much, and as a result I feel tired most of the time.

20. I eat fast, because sometimes I feel that I could put the time I spend eating to better use.

21. I frequently get irritated when a person takes too long in making his/her point in a normal conversation.

22. I get agitated when someone is late in meeting me.

Perceived Stress

Instructions

This portion of the questionnaire relates primarily to the extent to which you perceive yourself as under stress and to what you consider the prime contributor. Using the scale below the extent to which you agree with the statements.

1 = Strongly disagree
2 = Moderately disagree
3 = Slightly disagree
4 = Neither agree nor disagree
5 = Slightly agree
6 = Moderately agree
7 = Strongly agree

23. My lifestyle away from school is extremely tense and stressful.

24. My unfulfilled homelife greatly adds to my frustration.

25. I feel a great deal of stress and anxiety in school.

26. I feel more stress and anxiety in school than in my previous job(s).

27. I must admit that it makes me angry when other people interfere with my daily activity.

28. I find that a well-ordered mode of life with regular hours is congenial to my temperament.

29. It bothers me when something interrupts my daily routine.

Family Inventory

Instructions

Indicate your agreement with the statement by selecting the answer which best represents your opinion.

Consider the term "spouse" in questions 30-34 to include any person with whom you have a similar relationship.

1 = Not at all
2 = To a very little extent
3 = To a little extent
4 = To a moderate extent
5 = To a fairly large extent
6 = To a great extent
7 = To a very great extent

30. To what extent are things going well between you and your spouse?

31. To what extent are there negative feelings between you and your spouse when you are together?

32. To what extent are you satisfied with your family life?

33. To what extent is your relationship with your spouse a good one?

34. To what extent do you and your spouse enjoy your time together?

Appendix B: Questionnaire II

STRESS MEASUREMENT QUESTIONNAIRE

The Stress Measurement Questionnaire (SMQ) is a tool designed to aid in measuring your personal stress level and determine some of the original components that may contribute to stress.

It is important that you answer all items honestly. This is the only way an accurate stress measurement can be made.

Your individual responses will be held in the strictest confidence and will not be provided to any person or organization. Only those individuals directly involved in this thesis will have access to your complete SMQ, however, there will be no way to identify the persons by name who complete the SMQ.

INSTRUCTIONS

This questionnaire contains 60 items (individual "questions"). All items must be answered by filling in the appropriate spaces on the computer-scored response sheet provided. If for any item you do not find a response that fits your situation exactly, use the one that is the closest to the way you feel.

Please use a soft-lead (No. 2) pencil, and observe the following:

1. Make heavy black marks that fill the space of the response you select.

2. Erase cleanly any response you wish to change.

3. Make no stray markings of any kind on the response sheet.

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(3) DOD Instruction 1100.13, 17 Apr 68, Surveys of Department of Defense Personnel, and/or

(4) AFR 30-23, 22 Sep 76, Air Force Personnel Survey Program.

b. Principal Purpose. The survey is being conducted to collect information to be used in research aimed at illuminating and providing inputs to the solution of problems of interest to the Air Force and/or DOD.

c. Routine Uses. The survey data will be converted to information for use in research of management related problems. Results of the research, based on data provided, will be included in a master's thesis and may also be included in published articles, reports, or texts. Distribution of the results of the research, based on the survey data, whether in written form or presented orally, will be unlimited.

d. Participation in this survey is entirely voluntary.

Personal Beliefs

Part I

This portion of the questionnaire relates to the way in which certain important events in our society affect different people. Each of the five items consists of a pair of alternatives labeled A or B. Using the scale below, indicate which statement most closely follows your own beliefs and record it on your answer sheet.

1 = I strongly agree more with statement A
2 = I moderately agree more with statement A
3 = I slightly agree more with statement A
4 = I slightly agree more with statement B
5 = I moderately agree more with statement B
6 = I strongly agree more with statement B

1. A Becoming a success is a matter of hard work; luck has little or nothing to do with it.
   B Getting a good job depends mainly on being in the right place at the right time.

2. A Getting people to do the right thing depends on ability; luck has little or nothing to do with it.
   B Who gets to be the boss often depends on who was lucky enough to be in the right place first.

3. A There is really no such thing as luck.
   B Most people don't realize the extent to which their lives are controlled by accidental happenings.

4. A It is impossible for me to believe that chance or luck plays an important role in my life.
   B Many times I feel that I have little influence over the things that happen to me.

5. A What happens to me is my own doing.
   B Sometimes I feel that I don't have enough control over the direction my life is taking.

6. A Usually people get the respect they deserve in this world.
   B An individual's worth often passes unrecognized no matter how hard he/she tries.

7. A The ideas that teachers are unfair to students is nonsense.
   B Most students don't realize the extent to which their grades are influenced by accidental happenings.

Part II

Answer questions 8 - 12 based on how you felt before you came to AFIT.

Indicate your agreement with the statements below using the following scale:

1 = Strongly disagree
2 = Moderately disagree
3 = Slightly disagree
4 = Neither agree nor disagree
5 = Slightly agree
6 = Moderately agree
7 = Strongly agree

8. What happens to me is usually of my own doing.

9. I frequently feel that in dealing with life situations I might do just as well if I flipped a coin.

10. Generally speaking, there really is no such thing as luck.

11. Witnout the right breaks one can not become effective as a manager.

12. Usually, individuals have misfortunes due to their own mistakes.

Part III

Answer questions 13 - 17 based on how you feel now.

Indicate your agreement with the statements below using the following scale:

1 = Strongly disagree
2 = Moderately disagree
3 = Slightly disagree
4 = Neither agree nor disagree
5 = Slightly agree
6 = Moderately agree
7 = Strongly agree

13. What happens to me is usually of my own doing.

14. I frequently feel that in dealing with life situations I might do just as well if I flipped a coin.

15. Generally speaking, there really is no such thing as luck.

16. Without the right breaks one can not become effective as a manager.

17. Usually, individuals have misfortunes due to their own mistakes.

Personal Attributes

Part I

The next set of questions is concerned with your personal attributes. Each item consists of five alternatives. Select the alternative that that is the most descriptive of you as an individual.

18. 1 Winning is everything; my satisfaction comes from winning.
    2 I like winning any game or event, and am very disappointed when I lose.
    3 I like winning any game or event, and am somewhat disappointed when I lose.
    4 I like winning any game or event, but I equally enjoy interaction and participation.
    5 I enjoy the social interaction and participation that comes with a game or event, and losing does not bother me at all.

19. 1 I do my very best when I'm fighting a tight deadline.
    2 I seem to do my best work when I have a reasonable deadline to meet.
    3 I work equally well whether I have a deadline to meet or not.
    4 Although I perform adequately with a deadline to meet, I prefer to not meet a deadline.
    5 I do not like deadlines; I do my best work when I'm not hurried in any manner.

20. 1 I hate to wait on anything or anybody.
    2 I do not enjoy waiting but I will if I absolutely have to.
    3 Although I really don't enjoy waiting, I don't mind if I don't have to wait too long.
    4 I don't mind waiting; there are many situations where one must wait.
    5 Waiting on something or someone is a pleasant opportunity to relax.

21. 1 I am always in a rush, even when I don't have to be.
    2 Most of the time I'm in a hurry, even when I don't have to be.
    3 I occasionally find myself in a hurry, even though most of the time I don't have to.
    4 I seldom hurry myself; only when I have to.
    5 I will not hurry myself, even when I know I'm late.

22. 1 I always try to do too much, as a result I always feel tired.
2 I frequently try to do too much, and as a result I feel tired most of the time.
3 On rare occasions I find myself trying to do too much; when these occasions arise, I slow down.
4 I pace myself in accomplishing tasks so that they are all accomplished with the minimum amount of fatigue.
5 I will not overextend myself, even if it means not getting something done.

23. 1 I set very high work standards for myself, and get very upset when I don't meet them.
2 I set high work standards, and get upset when I don't meet them.
3 I set my own work standards, and it bothers me somewhat if I don't meet them.
4 I set work standards for myself, and it bothers me to a little extent if I don't meet them.
5 I maintain work standards that I can make without over-extending myself, and I do not get upset if I occasionally fail.

Part II

Indicate your agreement with the statement by selecting the response which best represents your attitude concerning your personal attributes.

1 = Strongly disagree
2 = Moderately disagree
3 = Slightly disagree
4 = Neither agree nor disagree
5 = Slightly agree
6 = Moderately agree
7 = Strongly agree

24. I like winning any game or event, and am very disappointed if I lose.

25. I hate to wait on anything or anybody.

26. I am frequently in a hurry, even when I don't have to be.

27. I frequently get upset with people, but I usually do not show it.

28. I set high work standards for myself, and get upset when I don't meet them.

29. I frequently try to do too much, and as a result I feel tired most of the time.

30. I eat fast, because sometimes I feel that I could put the time I spend eating to better use.

31. I frequently get irritated when a person takes too long in making his/her point in a normal conversation.

32. I get agitated when someone is late in meeting me.

Assertiveness Inventory

Instructions

The following questions will attempt to measure your level of assertiveness. Indicate your agreement with the statements by
selecting the answer which best represents your opinion.

1 = Not at all	5 = To a fairly large extent
2 = To a very little extent	6 = To a great extent
3 = To a little extent	7 = To a very great extent
4 = To a moderate extent	

33. To what extent do you call it to his/her attention when a person is highly unfair?

34. To what extent do you speak out or protest when someone takes your place in line?

35. To what extent do you call attention to the situation in which a latecomer is waited on before you?

36. To what extent do you insist that your landlord (mechanic, repairman, etc.) make repairs that are his/her responsibility to make?

37. To what extent are you able to speak up for your viewpoint when you differ with a person you respect?

Perceived Stress

Instructions

This portion of the questionnaire relates primarily to the extent to which you perceive yourself as under stress and to what you consider the prime contributor. Using the scale below the extent to which you agree with the statements.

1 = Strongly disagree
2 = Moderately disagree
3 = Slightly disagree
4 = Neither agree nor disagree
5 = Slightly agree
6 = Moderately agree
7 = Strongly agree

38. My lifestyle away from school is extremely tense and stressful.

39. My unfulfilled homelife greatly adds to my frustration.

40. I feel a great deal of stress and anxiety in school.

41. I feel more stress and anxiety in school than in my previous job(s).

42. I must admit that it makes me angry when other people interfere with my daily activity.

43. I find that a well-ordered mode of life with regular hours is congenial to my temperament.

44. It bothers me when something interrupts my daily routine.

Family Inventory

Instructions

Indicate your agreement with the statement by selecting the answer which best represents your opinion.

Consider the term "spouse" in questions 45 - 49 to include any person with whom you have a similar relationship. If you are not married or involved in any significant relationships skip to question 50.

1 = Not at all	5 = To a fairly large extent
2 = To a very little extent	6 = To a great extent
3 = To a little extent	7 = To a very great extent
4 = To a moderate extent	

45. To what extent are things going well between you and your spouse?

46. To what extent are there negative feelings between you and your spouse when you are together?

47. To what extent are you satisfied with your family life?

48. To what extent is your relationship with your spouse a good one?

49. To what extent do you and your spouse enjoy your time together?

Background Information

Instructions

The last section of this survey concerns your background. Select the most appropriate alternative.

50. Your race is:

1 American Indian or Alaskan Native
2 Asian or Pacific Islander
3 Black, not of Hispanic origin
4 Hispanic
5 White, not of Hispanic origin
6 Other

51. Your sex is:
1 Male
2 Female

52. Have you been diagnosed as having coronary artery/heart disease?

1 Yes
2 No

53. Have you been diagnosed as having an ulcer?

1 Yes
2 No

54. Do you have a problem with your blood pressure?

1 I don't know
2 Yes
3 No

55. Do you have frequent or severe headaches?

1 Yes
2 No

56. If you smoke cigarettes, you smoke the following number of cigarettes per day:

1 I do not smoke cigarettes
2 Less than 5
3 6 - 10
4 11 - 20
5 21 - 30
6 31 - 40
7 More than 40

57. If you smoke a pipe or cigar, you smoke the following number of pipe bowls or cigars per day:

1 I do not smoke a pipe or cigar
2 Less than 2 bowls or cigars
3 2 - 4 bowls or cigars
4 5 - 6 bowls or cigars
5 7 - 8 bowls or cigars
6 9 - 10 bowls or cigars
7 More than 10 bowls or cigars

58. If you are a jogger, the average number of miles you jog per day is:

1 I do not jog
2 1 mile
3 2 miles
4 3 miles
5 4 miles
6 5 miles
7 More than 5 miles

59. If you exercise regularly, the average amount of time per day that you exercise is:

1 I do not exercise
2 10 minutes
3 15 minutes
4 20 minutes
5 25 minutes
6 30 minutes
7 More than 30 minutes

60. Which of the following best describes your martial status:

1 Married - Spouse is not employed
2 Married - Spouse is employed outside home
3 Married - Separated due to employment and have children
4 Married - Separated due to employment, children are with spouse
5 Married - Separated by choice and have children
6 Married - Separated by choice, children are with spouse
7 Divorced - Do not have custody of children
8 Divorced - Do have custody of children
9 Single - No children
10 Single parent

Appendix C: Pearson Correlation Values, Questionnaire I

	V2	V3	V4
V1	-0.69 P=0.27	-0.05 P=0.33	-0.09 P=0.21
V2		0.60 P=0.00	0.23 P=0.01
V3			0.34 P=0.00

Appendix D: Pearson Correlation Values, Questionnaire II

	V6	V7	V8	V9	V10	V11	V12
V5	0.75 P=0.00	0.78 P=0.00	-0.07 P=0.25	-0.08 P=0.24	-0.01 P=0.48	0.02 P=0.42	-0.23 P=0.02
V6		0.80 P=0.00	-0.07 P=0.27	-0.10 P=0.19	0.06 P=0.30	0.10 P=0.19	-0.29 P=0.00
V7			-0.15 P=0.09	-0.19 P=0.04	0.10 P=0.19	-0.01 P=0.45	-0.24 P=0.01
V8				0.67 P=0.00	0.19 P=0.04	0.24 P=0.02	0.05 P=0.34
V9					0.14 P=0.10	0.37 P=0.00	0.01 P=0.47
V10						-0.06 P=0.30	0.07 P=0.27
V11							0.24 P=0.02

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VITA

Capt Susan A. Answay graduated from the University of Pittsburgh, Pennsylvania. She received the degree of Bachelor of Science in Biology in April 1976. She received a commission in the USAF in May 1979 through the OTS commissioning program. Upon completion of the Executive Support Officer Course at Keesler AFB, Mississippi she served as the Executive Support Officer of the 343d Missile Security Squadron, Malmstrom AFB, Montana. She was transferred in June 1981 to Spangdahlem Air Base, Federal Republic of Germany, where she served as Squadron Section Commander for the 52d Aircraft Generation Squadron and, finally, as the Maintenance Management Division Chief of the 52nd Tactical Fighter Wing Maintenance Complex. She then entered the School of Systems and Logistics, Air Force Institute of Technology, in June 1984.

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Past research suggests that a relationship exists between environmental changes and locus of control. This investigation determined that as the environment changes to a more structured rigid environment, the individual will shift from an internal to an external locus of control. This determination was based on statistical analysis using Pearson correlations, paired t-tests, and regression analysis. Relationships between Type A behavior, stress, assertiveness and locus of control were found to a certain degree.

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