INTERPERSONAL TRUST, LIFE EVENTS AND SELECTED CORONARY HEART DISEASE RISK FACTORS IN A COLLEGE POPULATION

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MARGARET TILLMAN BEARD, B.A., M.S.

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We hereby recommend that the prepared under our supervision by Margaret Tillman Beard entitled Interpersonal Trust, Life Events and Selected Coronary Heart Disease Risk in a College Population

be accepted as fulfilling this part of the requirements for the Degree of Doctor of Philosophy.

Committee:

Patricia N. Mahon, Ph.D
Chairman

Lynne M. Lydmundsen

Edward K. Stone

John W. McFarland

Margie N. Johnson

Anne M. Sudmundson

Accepted:

Margaret J. Ferrell
Dean of The Graduate School

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Abstract

Problem: What is the relationship between interpersonal trust and life events and coronary heart disease risk factors? A two group survey method with a volunteer university sample of 105 subjects comprising 54 males and 51 females in two age groups, 20 to 35 and 50 to 65 were used. Rotter's Interpersonal Trust Scale and Holmes and Rahe Recent Life Changes Questionnaire were instruments used. Subjects were asked to: complete a health history, have blood pressure, weight, height and pulse recorded, maintain a nutrition diary, and have one fasting blood sample drawn. Results indicated significant correlations between interpersonal trust, life events, age, sodium levels, potassium levels, and carbon dioxide levels. There were also differences in number of packs of cigarettes smoked per day, carbohydrate intake, life events, systolic and diastolic blood pressure, and mean arterial pressure. It was concluded that a significant relationship exists between interpersonal trust and life events and coronary heart disease risk factors, diastolic blood pressure, body mass index, exercise, age, carbohydrate intake, and blood values. Older subjects have significantly lower level of interpersonal trust than the younger subjects.

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Chapter

Introduction

The purpose of this study was to examine the relationship between interpersonal trust, life events, and coronary heart disease risk factors. The major theoretical and methodological focus of this study is centered on the concept of interpersonal trust as a generalized expectancy, perception of life events as stress, and risk factors in the development of coronary heart disease in younger and older adults.

In this particular investigation, health history, general opinion as related to interpersonal trust, and perception of adjustment to recent life events were inventoried. A 7-day nutrition diary, bio-medical measures, and clinical measures were also obtained.

The relationships between life events and coronary heart disease have been the subject of much scientific investigation; however, little consideration has been given to the variable of interpersonal trust. Interpersonal trust may be viewed theoretically as an internal factor which serves as a buffer to life events in the presence of other factors and the risk of coronary heart disease.

The theoretical proposition of interpersonal trust is derived from the social learning theory of Rotter (1954) and states that goal directed behavior is a function of the expectancy and reinforcement value in a given situation (Rotter, 1975). The theoretical propositions for conceptualizing interpersonal trust, life events and risk of coronary heart disease are several, based on the general adaptation syndrome of Selye (1946). The first proposition is that coronary heart disease and interpersonal trust alterations are diseases of adaptation which have no single cause, no specific pathogen, but are due largely to nonspecific stress and to pathogenic situations resulting from inappropriate responses to nonspecific stress (Selye, 1955, p. 254). The second proposition is that any agent demanding increased vital activity automatically elicits a nonspecific defense mechanism which raises resistance to stressful agents (Selye, 1965, p. 98). The third proposition is that cardiovascular derangement depends upon an individual's reaction to demands. The fourth proposition is that the cumulative effect of everyday stress may become pathogenic and add to premature development of the aging process and to coronary heart disease development in the presence of other conditions.

The fifth proposition deals with the three phases of

the general adaptation syndrome. If there are alterations in the level of trust, such as trustlessness or mistrust, then (1) general resources are mobilized in response to the situation, (2) specific responses are mobilized in response to tension if the initial problem goes unsolved, and (3) depletion of energy and resources results from increased maintenance needs and biochemical changes.

Interpersonal trust is important in the area of mental health and in the area of diagnosed mental illness. Trust is a basic factor of human existence. The quality of trust is important in human growth, in development, and in interpersonal situations. Each person's experience involves dependence on others for fulfillment of biological and socio-psychological needs. Because of the unpredictability of others' responses, the need to understand interpersonal trust is indicated. Suspicion in the relationship instead of trust can be a source of stress.

Generally, trust and stress are part of everyday occurrences. Various life events occur in which energy is expended in deciding what to do about an event and behaviorally acting on that decision (Scott, 1977). Life event challenges evoke defensive physiological arousal without providing opportunities for musculoskeletal discharge of

the arousal state. Chronic arousal is damaging to the cardiovascular system (Dembroski, 1977).

The concept of coronary heart disease risk factors is based on comprehensive research data. High-risk factors are numerous and varied. The main factors are age, sex, blood pressure, cholesterol, tobacco, obesity, diabetes mellitus, sedentary life style, psychological profile, psychosocial factors and heredity. Coronary heart disease risk is multifactoral and the presence of one factor does not carry the same weight as the simultaneous presence of many factors (Degré, 1977). The forewarnings of coronary heart disease can be detected in the newborn (Neufeld, 1974).

Coronary heart disease is a problem of epidemic proportions in economically developed countries, is the commonest cause of death in the western world, and is increasing in many other countries. Coronary disease is responsible for 54.1 per cent of fatalities in the United States and like death, it is associated with age (Neufeld, 1974). However, recent documented evidence reveals the existence of coronary heart disease in the young (Enos, 1962; Kaplan, 1967; Neufeld, 1974). It further reveals that coronary heart disease is a more severe and devastating disease in the overall younger age groups than in the

old age group (Kaplan, 1967) and that there is an increased frequency among young people now than some decades ago (Selye, 1976).

The Problem

What is the relationship between interpersonal trust and life events, and coronary heart disease risk factors of younger and older persons?

Stress has protective values. Suitably handled, stress can produce and also prevent disease (Selye, 1965). Because of this, it is expedient to clarify and make explicit the relationship of interpersonal influence processes as potential contributors to the quality of life (Mettlin and Woelfel, 1974). Is a high level of trust a psychological factor which protects the human organism from risks of coronary heart disease?

The incidence of arteriosclerosis and coronary heart disease increases with age (Selye, 1976). Do older persons experience more stress than younger persons? Are coronary heart disease risk factors more prevalent among younger or older persons?

Does a decrease in trust occur with age? Jean Jacques Rousseau (1712-1788), the French philosopher, is described as displaying marked symptoms of a lack of trust during the latter part of his life. According to Rousseau, his

enemies corrupt vegetable peddlers so they would sell him better vegetables more cheaply to prove their generosity and his baseness (Coleman, 1976).

Hypotheses

The null hypotheses that were tested are listed below. In each case the hypotheses were tested for the total group, for younger and older subjects, and for differences between younger and older subjects:

1. No significant relationship exists between interpersonal trust, and life events, and coronary heart disease risk factors.

2. No significant relationship exists between interpersonal trust, and clinical, and biochemical measures of subjects.

3. No significant relationship exists between subjects' interpersonal trust scores, and dietary intake, and biochemical measures.

Significance

Interpersonal trust, life events and coronary heart disease risk factors are important considerations in health care today. The inter-relationships of these variables are paramount to developing an understanding of psychophysiological adaptation. Trust is an endogenous factor while

life events are exogenous factors influencing adaptive capacity. If the health of people is dependent upon harmonious interaction of endogenous and exogenous factors, it follows that illness or psychophysiological disruption is a result of disharmony.

The relationship of interpersonal trust and life events as factors influencing the adaptive capacity may provide further insight into psychophysiological dynamics and the development of coronary heart disease. Enhanced knowledge of variables that affect adaptation may help nurses identify persons at risk and help them adapt more effectively. Upgrading the quality of health care through high-level wellness cannot be accomplished without attaining a better understanding of the interaction of biochemical, physical, psychological and sociocultural variables. If health is considered a state of adaptation, then factors influencing adaptive ability are important for exploration to gain insight into the nature of adaptation and maladaptation. This is essential before the design of educative and intervention systems. Reduction of conditions that lead to maladaptive functioning can be achieved by identifying factors, susceptible persons and appropriate intervention techniques.

Rogers (1961) summarizes research in which an increase in trust appeared to be causally related to increased emotional stability, increased self control and decreased physiological arousal to defend against threat. It may be possible that a clue to reducing illnesses and improving the quality of life is an increase in the level of trust. Studies have examined the relationship between life events and illness but this investigator found none which focused on the role of interpersonal trust in producing or preventing illness. If a lack of trust makes one ill as observed in paranoid states, then a high level of trust may provide a protective factor.

Findings of this study could provide a means for better understanding the aging process, the effects of nutrition on mental health, the interpersonal trust levels of younger and older adults, persons at risk for interpersonal trust alterations, and risk factors of coronary heart disease. The findings may also be helpful in nursing diagnosis, may provide a clue to disease susceptability, and may have implications for primary prevention.

Chapter II

Review of Literature

Trust

The importance of basic trust was first emphasized by Erikson (1959). He defined trust as an

> attitude toward oneself and the world derived from the experiences of the first year of life ...and implies not only that one has learned to rely on the sameness and continuity of the outer providers but also that one may trust oneself and the capacity of one's own organs to cope with urges (Erikson, 1959, p. 112).

Erikson (1950) proposed a psychosocial theory of personality with the primary stage a balance between trust and mistrust. If biological and social needs are met regularly and predictably during the first year of life, the child reacts to people in a trusting fashion. Development of a sense of trust is a crucial factor in successful resolution of stressors in life. Trust in self and environment is the cornerstone of a healthy personality. A basic sense of mistrust may develop and last throughout life if there are discontinuities in care (Erikson, 1960).

Maslow (1962) states that the development of a basic attitude of trust within a child is the first step

necessary toward the development of a mature person. Child development is a continuous process of choosing between the need for safety and the delight of new experiences. The love and approval of others are necessary for physical and emotional security. New experiences involve self-trust and safety. The need for safety is dominant over the need for change. Growth through change requires trust in oneself and trust in others. This involves interpersonal and intrapersonal trust.

Rotter (1967) defined the trust variable in terms of expectations. This person expects others to be honest, to be open and to do what they say they will do. This person is cynical, thinks others are out to get as much as they can for themselves, has little faith in human nature, and little faith in the promises or statements of others.

Some degree of trust in the confirmation of others is necessary for survival. A human being, who remains isolated, is threatened by loneliness. Feeling the need to justify existence against non-being, energies are directed toward self-defense and self-justification which increases isolation and loneliness. Trust aims at interpersonal truth. A failure of mutual trust leads to self

concern in search for security. Self-concern cannot provide the security of trust.

> It separates the partners in their longing for mutuality, by emerging suspicions. Trust, by its very nature, does not force, does not impose one partner's will on the other; nor does a trusting person give up his own identity to submit to the partner's wishes, blindly for the sake of peace and harmony. Trust is characterized by self-revelation that needs neither diplomacy nor hypocrisy, no false appearances for the sake of approval, no clever persuasion or concealment to avoid disapproval (Weigert, 1960, p. 124).

Threatened isolation and loss of trust could lead to anxiety. Anxiety is a basic problem in all neuroses and is at the root of functional psychosis. Openness to the future and to the encompassing world is reflected in the subjective experience of trust.

Rogers emphasizes the importance of trust. Trustworthiness is important if the relationship is to be helpful. To create a helping relationship, it is necessary to be in some way which will be perceived by the other person as trustworthy. Being trustworthy is being dependably real. Being congruent implies that whatever feeling or attitude is being experienced is matched by an awareness of that attitude. In summarizing his approach to human relationships, Rogers states:

> I have come to trust persons--their capacity for exploring and understanding themselves and their troubles, and their ability to resolve those problems--in any close, continuing relationship where I can provide a climate of real warmth and understanding. I am going to venture to put the same kind of trust in a staff group, endeavoring to build an atmosphere in which each is responsible for the actions of the group as a whole, and where the group has a responsibility to each individual. Authority has been given to me, and I'm going to give it to the group.
>
> I am going to experiment with putting trust in students, in class groups, to choose their own directions and to evaluate their progress in terms of their own choosing (Rogers, 1973, p. 10).

The importance of trust in nursing is emphasized. Developing a sense of trust is the cornerstone of wholesome personality development. A child builds a "trust account" through hundreds of interactions and events (Dittman, 1966). Nurses see children and other clients at a time when unusual demands are made on their trust accounts. Withdrawals can be made on the trust account in times of everyday stresses. It is a bulwark from which to cope with the unexpected and the unknown. Such an account is needed for moments of deeper frustration, deprivation and disappointment. As years pass, a child may build up a trust account large enough to tide him over the most shattering losses. Nurses usually are brought in contact with clients when circumstances have caused large withdrawals to be made from trust accounts.

The quality of trust is important in interpersonal situations. The patient's trust in a nurse, the nurse's acceptance of it, and the nurse's respect for the patient are interacting forces which aid in the maintenance of the nurse-patient relationship (Orem, 1971). If the person trusts himself to be open to experience, he will discover guidance and control for health growth. Hiding one's feelings or playing the part of another's expectations hinders authentic behavior. Although the importance of interpersonal trust in nursing is emphasized, research evidence indicates a paucity of studies in this area. Interpersonal trust has been studied more extensively in industry and school settings.

Mellinger measured interpersonal trust as a factor in communication with 330 professional scientists (Mellinger, 1956). He found that perceptions are impaired with overestimate and underestimate agreement and that concealment is accomplished by evasive, compliant or aggressive communication.

Using college students as subjects, many studies of trust have been conducted. Findings using game choices indicate that low scores on the F scale are trusting and trustworthy while high scores are suspicious and untrustworthy (Deutsch, 1960) and that both matching and concili-

atory strategies increase cooperation but the combination of concilatory strategy with honest prior announcement are the most effective strategy for inducing reciprocal cooperation (Pilisuk & Skolnick, 1968). Also with college students as subjects, Garske found intercorrelations between the total score of Rotter's interpersonal trust scale and Cattell 16 PF which indicated convergent and discriminant validation for the generalized expectancy construct of trust (Garske, 1976). Interpersonal trust tended to be related with personality traits that suggested a social orientation and adaptive functioning. A relationship has been found between self-concept and psychological distance for females, with more trusting females producing closer distances than less trusting females (Tolar, Cramer, D'Amico & O'Marra, 1975).

Deutsch (1958) was the first to study the phenomena of trust. He found that mutual trust can occur where people are unconcerned with each other's welfare, provided the situation leads one to expect one's trust to be fulfilled. In a six year study of interpersonal trust with college students, Rotter found a decrease in trust which led to special concern (Rotter, 1971).

Wallston, Wallston & Gore (1973) devised a scale to measure nurses' beliefs in the expectancy that patients

could be trusted. In their research on factors that influence information disclosure to nurses, it was hypothesized that patients would be able to ascertain which nurses were more trusting and that such high trust nurses would elicit more disclosures from patients who otherwise might be reticent to communicate pertinent information. The scale was found to have face, concurrent, predictive and discriminant validity.

Life Events

Research findings link events to onset and intensity of health disorders. A significant relationship has been reported between life change and physical illness in general (Dohrenwend & Dohrenwend, 1974; Gunderson & Rahe, 1974), between specific diseases such as myocardial infarction (Rahe & Paasikini, 1971), and between sudden cardiac death (Rahe & Lind, 1971). Other investigators have found associations between life events and mental illness in general (Dohrenwend, 1975), schizophrenia (Dohrenwend & Dohrenwend, 1974), attempted suicide (Gunderson & Rahe, 1974), and psychophysiological symptoms (Wyler, Masuda & Holmes, 1971). There is also research indicating the severity of physical and mental health problems increase with the intensity of life change experienced. One explanation

for the association between life change and health change is that changing situations requiring adaptive behavior evoke significant alterations in the psychophysiological system which lowers resistance to illness. Selye found that if rats are exposed to stress prior to sensitizing pretreatment, subsequent exposure to stress does not cause cardiac death. Finding that only unaccustomed stress triggers cardic accidents, he concluded that pretreatment with stress offers protection (Selye, 1965).

Studies reveal an association between life events and psychological impairment. Among a sample of 938 adults in New Haven; Myers, Lindenthal and Pepper (1971) found a positive relationship between psychological impairment and the experiencing of life events in the year previous to the interview. On examining the relationship between life changes and psychiatric disturbance, Micklin and Leon (1978) found higher symptom scores for females. Strategies aimed at primary prevention were suggested by removing the likely source of stress which may be the inequalities be tween the two sexes.

Holmes and Rahe's Social Readjustment Scale which was introduced in 1967 has been used extensively in stress research (Holmes & Rahe, 1967). The relationship between life stress and illness was suspected but little was known

about pathogenic events and in what manner or what type of person. Researchers have focused on multiple consequences of a single calamity, have searched backward from a specific illness to discover the stressful experience that might be counted among the causative factors, and have sought to develop typologies or personality profiles of persons vulnerable to particular life events (Spielberger & Saranson, 1975). Controversy also emerged as to whether upheaval caused by pleasant or desirable changes should be viewed as stressful. According to Holmes and Rahe (1967), it is not necessarily the negative or undesirable life events that lead to pathology but the amount of change involved. Man has finite capacity for adaptation and each change in the life of a person requires an adaptation. When the amount of change exceeds the adaptive capacity, the result is a lowering of bodily resistance with increased probability of disease. Defining stress as the rate at which one lives at any moment, Selye emphasized the importance of learning to live a full life with a minimum of wear and tear (Selye, 1965). Certain hormones and nervous reactions exert a protective influence under the stress of life. The stress defense mechanism is an increased secretion of adrenocorticotropic hormone. In addition to hormones serving as defense against stress, other chemical

compounds and the reactions of the nervous system in response to stress are of great importance. Both chemical and hormone reactions are subject to error and can precipitate disease. Certain emotional disturbances, high blood pressure, and cardiovascular disease are diseases of adaptation.

In a study of sudden cardiac death, life change data was gathered on 39 subjects over the last three years of their lives. For subjects with and without prior histories of coronary heart disease, findings indicated a significant increase in the number and intensity of life-change units during the final six months of their lives compared to identical time periods two or three years prior to death. The life-change event increase was threefold in magnitude (Coleman, 1973).

Coronary Heart Disease

Dramatic changes in the type and pattern of diseases attacking western societies in the past century are amply documented. With the process of modernization, urbanization and industrialization have come an initial increase in coronary heart disease and mental disorders while a subsequent decrease in the infectious diseases is noted (Reeder, 1971).

That the increased incidence of coronary heart disease is of recent origin is documented by Dr. Austin Flint, a noted New York physician who remarked about coronary heart disease in 1866, "it is an affliction of rare occurrence. Of over 150 cases of organic disease of the heart which I have analyzed and a few since, it occurred in only 7..." (Flint, 1866). In 1812, Corvisart expressed the view that cardiac disease depends upon the "passions of men" and that the heart can be injured by emotional arousal associated with anger, fear or despair (Selye, 1976).

The Framingham Study has been in continuous operation for 25 years involving 5,209 subjects ages 30-62 years to learn in what areas those who develop cardiovascular disease differ from those who do not (Kannel & McGee, 1979). This classic investigation helped elucidate the precursors of coronary heart disease. It indicated that elevated levels of serum lipids, including cholesterol, phospholipids, beta and prebeta lipoproteins; hypertension; obesity; low vital capacity; electrocardiographic abnormalities; diabetes; genetic disposition; smoking; and a sedentary life style were all associated with increased incidence of coronary heart disease (Corday & Corday, 1975). The findings have been corroborated by others in voluminous studies.

Coronary heart disease risk factors first elucidated by the Framingham study were higher mean serum cholesterol, elevation of blood pressure and electrocardiographic pattern of left ventricular hypertrophy (Kannel, Dawber, Kagan, Revotskie & Stokes, 1961). Coronary heart disease was found to be rare in the female (two per thousand) in sharp contrast to the male of the same age (twenty-five per thousand) (Kannel et al., 1961). It is probably that the difference in the incidence of coronary artery disease in the two sexes can be attributed to the role of sex hormones. Estrogens appear to protect the artery from atherosclerosis while there is evidence to suggest that androgens make the artery more vulnerable (Cochran & Givenup, 1962). From a study of major clinical features of 231 women with proved myocardial infarctions, it was concluded that coronary artery disease must be seriously considered in women presenting a suggestive clinical picture, particularly in the younger age groups (Weinreb, German & Rosenberg, 1947).

A comprehensive prospective study of coronary heart disease risk factors was done by the Inter-Society Commission for Heart Disease Resources (Stamler, 1970). The study represents the combined results of projects in Framingham, Massachusetts; Albany, New York; Los Angeles,

California; and two studies in Chicago, Illinios. Subjects were randomly selected; biochemical, medical and social data were collected. Following this, subjects were followed for a ten-year period to collect outcome data on their health. It was concluded that the three risk factors--hypercholesterolemia, hypertension, and cigarette smoking--are properly designated major risk factors for premature coronary heart disease (Stamler, 1970).

> This designation is appropriate first because of the impact of these factors on risk, particularly when present in combination, second because of the consistency of the findings from multiple studies, and third because of the frequency of occurrence of these factors singly and in combination in the American population (Stamler, 1970, p. 69).

The pooled results of five longitudinal investigations on the incidence of coronary heart disease in middle-aged white men plus findings from eight separate studies working together add further to the large body of epidemiologic data that the three major risk factors and premature coronary heart disease meet the criteria of consistency, strength, graded relationship and predictive capacity. Predictive analyses of pooling projects demonstrate the findings to be generalizeable for predictive purposes both qualitatively and quantitatively for middle-aged white men in the United States (The Pooling Project

Research Group, 1978). Coronary heart disease rate is much higher among both American and African Negro women than men. Primary prevention studies have successfully employed low fat, relatively unsaturated diets for lowering serum cholesterol (Jolliffe, 1959; Stamler, 1960; Pilkington, 1960).

The Nature of Coronary Heart Disease

Stated simply, coronary heart disease is a result of a buildup of fatty materials, most prominently cholesterol, in the walls of medium and larger arteries supplying blood to the heart. The blood supply to the heart muscle decreases as the buildup of fatty materials increases. This eventually cuts off some of the arteries completely and damages the heart muscle tissue. Pain associated with a reduced blood supply is called angina pectoris. An attack which completely blocks an artery and damages the heart muscle tissue is called a myocardial infarction or in lay terms, heart attack.

Coronary heart disease does not have a single cause as most infectious diseases but occurs as a result of multiple causes which work slowly within the individual (Dawber, Meadors & Moore, 1951). The central cause of coronary heart disease appears to be cholesterol (Friedman & Rosenman, 1974). Although the function of cholesterol

in the body is not completely known, it is thought to provide a sheath around the cell which provides a supportive framework for it. Cholesterol is nature's cellular insulator keeping "separate the individual electrochemical reactions taking place in each of your active brain and nerve cells" (Friedman & Rosenman, 1974).

Cholesterol is thought to be related to the transport of fats in the blood, which may be another of its functions. Because cholesterol and fats are not readily soluble in the blood, they must be bound to protein molecules (lipoproteins) so that they can be transported to areas of the body where they are needed as metabolic fuel (Hinkle, 1967).

The blood cholesterol level is thought to be a function of the amount of cholesterol consumed in the diet. The level of cholesterol decreases during prolonged muscular activity and appears to increase during stressful periods.

The possibility of intervening in the process of coronary heart disease by treating the risk factors is excellent since the disease takes years to develop overt symptoms. Neufeld divided the development of coronary heart disease into three stages: (1) incubation period, recognized in fetal life, infancy, childhood and adolescence;

(2) latent period, asymptomatic but already presenting pathological changes in young age; and (3) clinical period, accompanied by signs and symptoms (Neufeld, 1974).

Selected Risk Factors

Smoking. Coronary heart disease is pluricausal. Cigarette smoking as a sole risk factor is associated with a tenfold greater risk of coronary heart disease (Stamler, 1968). In the healthy, there is increased coronary blood flow but in persons with coronary artery disease, the increased myocardial demands cannot be met and ischemia with dysrhythmias may occur. Nicotine stimulates catecholamine production. Smokers who inhale may have carboxyhaemoglobin (COHB) levels up to 15 per cent. Carbon dioxide combines more readily with hemoglobin than oxygen, and displaces the oxygen dissociation to the left. Endothelial permeability is increased which may lead to atheroscleroses. Subjects with a carboxyhemogloben over five per cent have a higher incidence of coronary heart disease (Turner & Ball, 1973).

Obesity. Obesity is associated with the risk of developing heart disease. A loss of body weight can occur in response to stressors. Stressors can cause a decrease in appetite and in caloric intake so that requirements are supplied by endogeneous sources, namely, the

breakdown of fat, protein, and carbohydrate stores (Selye, 1976). Sometimes under the influence of psychogenic stress of moderate intensity, people will eat more because a full stomach has a tranquilizing effect and also takes their mind off the psychogenic irritant to which they are exposed. These people tend to become overweight as they are driven to food in a manner similar to that of subjects driven to alcohol or drugs (Selye, 1976).

Exercise. Exercise is considered dangerous and also of prophylactic value in persons prone to coronary heart disease. Keeping fit through gradual comparatively mild exercise induces considerable resistance, whereas sudden extreme muscular effort may precipitate a cardiac accident, especially in persons used to sedentary life and unadapted to muscular effort (Selye, 1976).

There is a gradual reduction in physical strength and ability to sustain strenuous physical exercise with advancing age. From respiratory measurements of 54 sedentary subjects ages 16 to 68 during progressive exercise on a bicycle ergometer, it was found that the maximum tolerated exercise as indicated by the highest achieved level of oxygen consumption diminished with age (Stevo, Amery, Whitlock & Conway, 1967). Older subjects had a lower resting cardiac output than normal subjects, but an identical

increase in cardiac output with oxygen consumption. The relationship between inspired air volume and heart rate with oxygen consumption at submaximal loads was not influenced by age. Systolic pressure increased progressively with exercise and showed a greater change in older subjects. Total peripheral resistance at rest increased with age, but with increasing exercise, this difference progressively diminished (Stevo et al., 1967).

Diet and serum lipids. Diet and serum lipids are important considerations in the development of coronary heart disease. Of central importance in evaluating the association between risk factors and coronary heart disease is the finding that arterial lesions cannot generally be produced experimentally in animals without a substantial modification of the diet involving increased intake of cholesterol and fat, leading to elevation of serum lipid levels (Stamler, 1970). Human populations consuming diets high in saturated fat and cholesterol have high mean serum cholesterol levels and high incidence and mortality from coronary heart disease, while populations consuming diets low in cholesterol have low mean serum cholesterol levels and mortality rates from coronary heart disease. "Recent evidence suggests that elevated serum triglycerides may also be related to increased risk of coronary heart

disease" (Stamler, 1970, p. 59). There is an emerging concept that high lipoprotein (HDL) may confer protection from premature atherogenesis. Premature refers to coronary heart disease manifested prior to age 59.

In a study of 100 men, ages 30 to 50, with documented coronary artery disease and post myocardial infarction who were placed under dietary management with 20 per cent fat diet matched with a group whose diet was not managed over a five year period, the diet managed group maintained a significant reduction in serum cholesterol. The serum triglyceride level was also significantly lower in the diet-managed group than in the non-diet managed group (Bierenbaum, Fleischman, Green, Raichelson, Hayton, Watson, & Caldwell, 1970).

Marked increases in serum cholesterol and triglycerides of persons kept on a constant diet and exposed to stressful events have been found (Wolf, Yamamoto, Adsett, & Schattstredt, 1962). Stressful interviews covering topics of known troublesome emotional significance to the subjects were used. Increases of serum cholesterol and triglycerides occurred within sixty minutes.

To ascertain whether the use of a serum cholesterol lowering diet would bring about a reduction in the incidence and mortality of coronary heart disease, dietary

intervention trials were carried out in two Finnish mental hospitals from 1959 to 1971. Diary fats were replaced with vegetable oils in the diets with substantial reduction in the mortality of men from coronary heart disease (Turpeinen, 1979).

Age. Age is considered a risk factor in coronary disease development.

> Following...short exposure to stress, simple rest will result in near complete recovery because most of the chemical waste of short term stress can be metabolized or excreted. After a whole lifetime of adaptation to the countless demands of homeostasis under constantly changing conditions, the destruction and elimination of wastes can no longer keep pace with their accumulation, probably representing...tissue aging (Selye, 1976, p. 1148).

There is a progressive decline in cardiac output with age (Brandfonbrener, Landowne & Shock, 1955). Landowne, Brandfonbrener and Shock (1955) concluded that the increase in mean brachial pressure with age was not significant, although systolic pressure increased; that the ratio of pressure to flow (a measure of total vascular resistance of greater circulation) increased with age; and that estimates of central elasticity are developed and are highly correlated with age.

Blood pressure. Systemic arterial blood pressure or blood pressure represents a force which is the result of cardiac output and peripheral vascular resistance.

Impressive clinical and experimental data as well as protective epidemiologic findings have demonstrated significant correlations between blood pressure and subsequent development of coronary heart disease (Doyle, 1963; Stamler, 1962). In a study of 21 high blood pressure subjects compared with 30 normal subjects, Rowe, Castillo, Maxwell, and Crumpton (1961) found an increase in coronary vascular resistance and in peripheral vascular resistance in the hypertensive subjects.

Stress. The intense effects that stress may exert upon the cardiovascular system are among the earliest manifestations of the emergency reaction in preparation for fight or flight (Eaton, 1978). Among the less frequently discussed cardiovascular manifestations of stress is that cardiac glycogen tends to be depleted.

The importance of expectations has been emphasized by Jackson (1962) who holds that symptoms of stress may be the consequence of conflicting expectations. Trust is an expectancy which the lack of may generate stressful emotion precipitating coronary heart disease. The effects are thought to be due to the secretion of catecholamines, often potentiated by adrenocorticoids, which increase myocardial oxygen needs. In the healthy individual this is met by increased coronary flow and no harmful results, but if there

is significant narrowing of the coronary arteries there will be impairment of function and even necrosis due to myocardial ischaemia (Turner & Ball, 1973). Catecholamine secretion may also produce electrolyte imbalance with loss of potassium and magnesium ions from the myocardial cells (Roab, 1966), a rise in triglycerides, free fatty acids, and cholesterol, increased platelet stickiness and thrombus formation with decreased fibrinolysis (Turner & Ball, 1973).

Selye discovered a marked sensitization of the heart muscle by corticoids to the necrotizing cardiotoxicity of injected catecholamines and stress-induced catecholamine action (Selye, 1968). A combination of catecholamine induced metabolic hypoxia with an ACTH-mediated, corticoid-induced superimposed loss of potassium from the heart muscle seems to constitute the underlying mechanism of myocardial destruction under stress (Roab, 1966).

Stressors stimulated by the cerebral cortex and hypothalamus, the sympathetic nervous system, which releases potentially myocardium-hypoxiating epinephrine from the adrenal medulla, and norepinephrine from the postganglionic nerve endings within the heart muscle, and the anterior pituitary, which by means of ACTH secretion release 17 - hydroxycorticosteroids from the adrenal cortex,

cause losses of potassium through the kidneys and losses of potassium from the heart muscle (Roab, 1966). This is critical in the presence of coronary atherosclerosis.

A type C personality was suggested by Rosenman, et al., as a kind of personality that is coronary prone in the absence of the kinds of conditions a type A person is likely to seek out for himself (Rosenman, Friedman, Strauss, Jenkins, Zyzanski & Wurm, 1970). Type A is characterized by self-driving, competitive, achievement-oriented, experiencing time urgency, and coronary prone. Type B is the opposite of all these dimensions. Thomas, Ross and Duszynski (1975) found a significant difference at the outset in hypercholesteremic subjects who subsequently sustained a myocardial infarction and hypercholesteremic subjects who did not.

Conceptual Framework

The conceptual framework for this investigation is the social learning theory of Rotter and Selye's neurophysiological theory of stress.

Rotter's theory explains goal-directed behavior by the formula:

$$B_{p \times S_1, R_a} = f\ (E_x \cdot R_a \cdot S_1, \& R V_a, S_1)$$

Behavior potential (B_p) is a function of expectancy (E) and reinforcement value (RV). Given a particular situation 1, and a particular reinforcement a, the potential for a behavior x to occur is a function of the expectation that the particular reinforcement a will occur, given the behavior x and the specific situation 1 and the value of reinforcement a, or the relative preference of reinforcement a in that situation. When more than one response is involved, the formula is modified to explain the behavior:

$$B_{p(x-n)}, S_{(1-n)}, R_{(a-n)} = f\ (E_{(f-n)}, S_{(1-n)}, R_{(a-n)} \ \& \ RV_{(a-n)}, S_{(1-n)})$$

The expectancy component is further defined by the formula:

$$E_{S1} = f\ (E^{1}_{S_1} + \frac{GE}{N_{S1}})$$

The formula expresses in a given situation the relative importance of specific versus generalized expectancies in determining behavior potential (Rotter, 1954, 1975). The potential of the occurrence of a behavior is a function of the expectancy that the behavior will lead to a particular reinforcement or reinforcements, and the value of these reinforcements in a given situation. The

relationship postulated among behavior potentials, expectancies, reinforcement values, and situations allows for the prediction of a specific behavior in a given situation. The generalization process accounts for the consistency and stability of behavior across situations. An expectancy is a function of a specific expectancy, and a generalized expectancy resulting from the generalization from related experience. The relative importance of the specific expectancy is a function of the degree of experience in that specific situation. The importance of generalized expectancy is a function of the degree of novelty, ambiguity, or unstructuredness of a particular situation. The more novel the situation, the greater the weight of generalized expectancies. Since expectancies generalize along lines of perceived similarity, relatively stable modes of responding develop. Within this framework, interpersonal trust is defined as an expectancy held by an individual or a group that the word, promise, verbal or written statement of another individual or group can be relied on. The expectancies are generalized and constitute a relatively stable personality characteristic.

Selye's neurophysiological theory of stress is used to conceptualize interpersonal trust, life events and coronary heart risk factors (Selye, 1946). The theory provides

a frame of reference based on processes related to the general adaptation syndrome. The general adaptation syndrome is a triphasic, non-specific, adaptive reaction comprising the alarm reaction, the phase of resistance and the phase of exhaustion. The non-specific response is characterized by increased pituitary-adrenal cortical hormone secretions. The adaptive reaction is the result of an agent (stressor) producing stress. The alarm reaction is elicited by sudden exposure to stimuli to which adaptation has not occurred. The phase of resistance is elicited by prolonged exposure to stimuli to which adaptation has been acquired as a result of continuous exposure. During the resistance phase, adaptation to one agent is required at the expense of resistance to other agents. Most morphologic and biochemical changes of the alarm disappear during this phase and in some cases the direction of the deviations from the normal is reversed.

The phase of exhaustion is the result of prolonged exposure to stimuli to which adaptation has been developed but could no longer be maintained. Response to stressors is influenced by age. The phase of exhaustion is similar to the exhaustion of vitality as a consequence of aging.

The general adaptation syndrome is the telescoped equivalent of a normal lifespan. As time passes, the

sensitivity and adaptability of childhood is followed by less responsiveness, but greater resistance of adulthood and eventually by tissue breakdown and degeneration, loss of adaptability and death (Selye, 1976).

Adaptive energy is the ability to acquire resistance to stress. The phase of resistance cannot be maintained indefinitely. If exposure to abnormal stimuli, real or imagined, continues, adaptation wears out. Aging is a function of the rate of adaptative energy expenditure. A fixed quantity of adaptive energy is present at birth.

Stress is the non-specific response of the body to any demand made upon it (Selye, 1974). Stress is basic to all adaptive reactions and is the sum of all non-specific biologic phenomena. A stressor is any agent which produces stress. A stressor may have adaptive or maladaptive results. The four main elements are: an antecedent stressor; conditioning or mediating factors such as diet which increase or decrease the impact of the stressor; the General Adaptation Syndrome of non-specific physical and chemical changes, indicating the intervening state of stress over time; and the consequent or maladaptive response in the form of a disease of adaptation which may be coronary heart disease or mental illness if there is a lack of trust. Diseases of adaptation and aging progress through three

phases: alarm, resistance, and exhaustion (Dohrenwend, 1961).

In Figure 1, life events and interpersonal trust are natural occurrences in the process of living. Trust is an internal factor which helps to defend against a stressor.

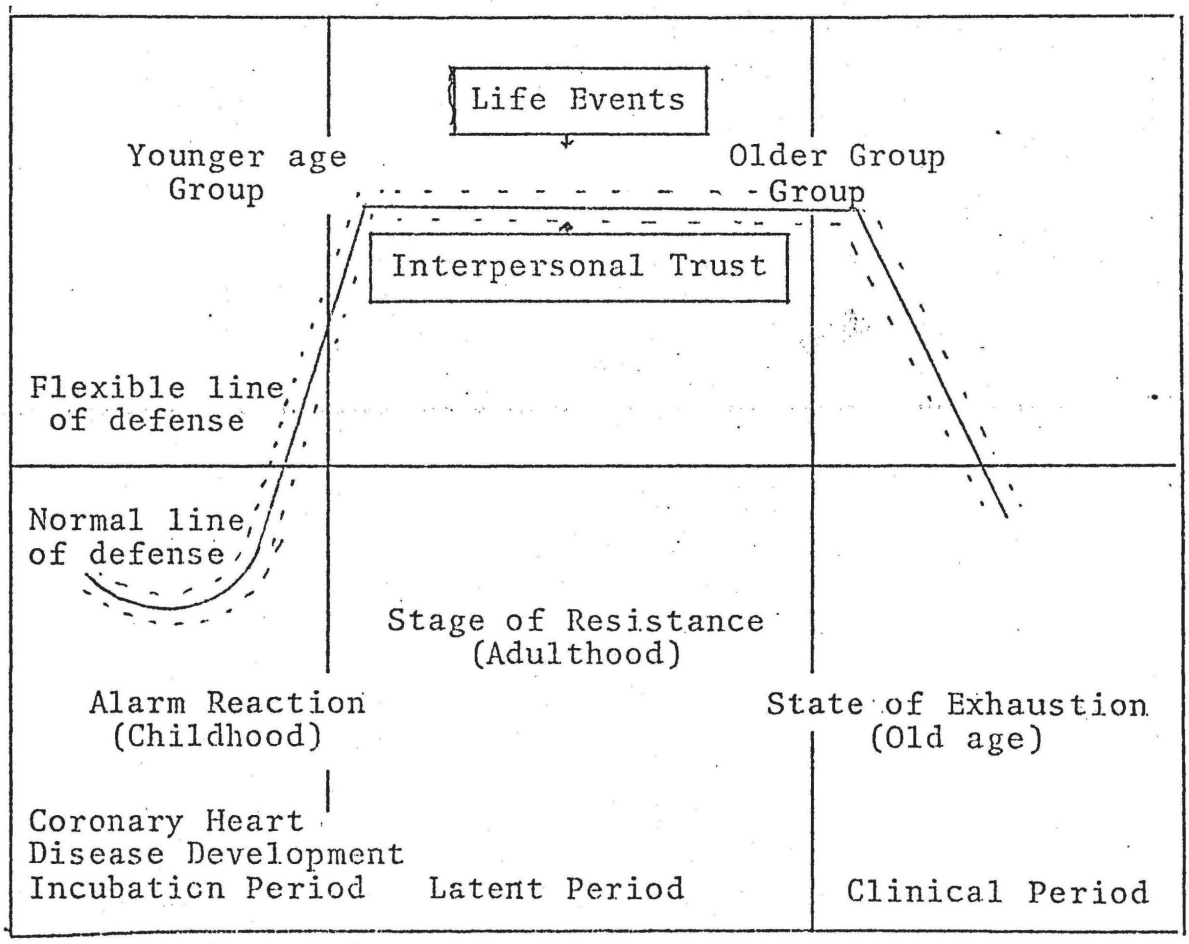

Figure 1. The General Adaptation Syndrome (Adapted from Selye, Hans. Stress in Health and Disease, 1976, p. 1150).

Each person has a normal line of defense which is the way a person is stabilized to deal with life events over time. The alarm reaction is the first phase of the General Adaptation Syndrome. This stage is equated with childhood and the incubation period of coronary heart disease development. The second stage, the stage of resistance, which is analagous to adulthood, constitutes the latent period in the development of coronary heart disease. The final stage, exhaustion, equated with old age, is the clinical period of coronary heart disease.

Homeostasis maintains the normal steady state by physiologic reactions. Heterostasis resets the thermostat to maintain a higher state of defense (Selye, 1973).

It is the intention of this study to provide empirical data for the existence of a constellation of social, physiological, and psychological measures which identify persons at risk for interpersonal trust alterations and coronary heart disease. Specifically, this study is designed to measure the relationship between trust and life events and coronary heart disease risk factors.

Dependent and Independent Variables

The dependent variable is the level of interpersonal trust.

The independent variables are life events and coronary heart disease risk factors. The coronary heart disease

risk factors are sex, diet, blood values, exercise, family history, body mass index, smoking, mean arterial pressure, blood pressure, systolic blood pressure, diastolic blood pressure, pulse, pulse pressure and age.

Hypotheses

The following formal null hypotheses were tested.

I. There is no significant relationship between interpersonal trust and life events and coronary heart disease risk factors of subjects.

II. There is no significant relationship between interpersonal trust, and life events and coronary heart disease risk factors of subjects ages 50 to 65.

III. There is no significant relationship between interpersonal trust and life events and coronary heart disease risk factors of subjects ages 20 to 35.

IV. There is no significant difference between interpersonal trust and life events and coronary heart disease risk factors of subjects ages 20 to 35 and subjects ages 50 to 65.

V. There is no significant relationship between interpersonal trust and clinical and biochemical measures of subjects.

VI. There is no significant relationship between interpersonal trust and clinical and biochemical measures of subjects ages 20 to 35.

VII. There is no significant relationship between inter-

personal trust and clinical and biochemical measures of subjects ages 50 to 65.

VIII. There is no significant difference between interpersonal trust and clinical and biochemical measures of subjects ages 20 to 35 and subjects ages 50 to 65.

IX. There is no significant relationship between interpersonal trust and dietary intake and biochemical measures.

X. There is no significant relationship between interpersonal trust and dietary intake and biochemical measures of subjects ages 20 to 35.

XI. There is no significant relationship between interpersonal trust and dietary intake and biochemical measures of subjects ages 50 to 65.

XII. There is no significant difference between interpersonal trust and dietary intake and biochemical measures of subjects ages 20 to 35 and subjects ages 50 to 65.

Definition of Terms

High-level wellness - The maximum health potential of the individual.

Interpersonal trust - Generalized expectations that the communication and behaviors of others can be relied on.

Expectancy - The probability held by the individual

that a particular reinforcement will occur as a function of specific behavior on his part in a specific situation or situations.

Life events - Desirable and undesirable occurrences in daily living. Life events and stress will be used interchangeably.

Social readjustment - A measure of the intensity and length of time necessary to accommodate to a life event.

Blood pressure - This is the amount of pressure exerted by the blood against the walls of arterial blood vessels as measured by an aneroid sphygmomanometer.

Systolic blood pressure. - The first sound heard with the aneroid sphygmomanometer.

Diastolic blood pressure - The last sound heard with the aneroid sphygmomanometer.

Mean arterial pressure - The diastolic pressure plus one third of the pulse pressure.

Pulse - The throb in an artery caused by the rise and fall of arterial pressure as the left ventricle contracts.

Pulse pressure - The difference between systolic and diastolic pressures.

Body mass index - A number representing the ratio of height and weight.

Aging - The cumulative effect of responses as the

cardiovascular system adapts to stressors.

Disease - An inferred relational structure of observed factors.

Basic Assumptions

1. Man in a state of wellness or illness is a dynamic composite of physiologic, psychologic, sociocultural and developmental variables which are always present.
2. Primary prevention relates to general knowledge applied in assessment to identify and allay possible risk factors associated with stress.
3. Each individual is a composite of characteristics within a normal range of responses which evolved over time.
4. There are many stressors, each with potential to disturb an individual's equilibrium. Particular relationship of physiologic, psychologic, sociocultural, and developmental variables can affect the degree to which the individual can defend against reaction to a single stressor or stressors.
5. In a state of wellness or illness, man is a dynamic composite of the interrelationships of physiologic, psychologic, sociocultural and developmental variables which are always present (Neuman, 1974).

6. Man is a categorizing organism continuously forming concepts, changing concepts and discovering new dimensions of similarity.
7. A common human experience is that of being provided with information from others, either promises of reinforcements to come or statements of presumed facts (Rotter, 1971).
8. The risk of coronary heart disease is pluricausal and becomes additive with each factor increasing the probability of developing the disease.
9. Adaptability decreases with age.

Delimitations

To increase homogeneity of the sample and reduce time and cost, subjects were from one university. There is reasonable basis for the belief that the level of interpersonal trust and the distribution of coronary heart disease risk factors in a college population in the United States is such that within college population variance is greater than between population variance and that a wide range of type-situations influencing the development of alterations in level of trust and coronary heart disease may be found in any college population. This hypothesis can be tested by similar studies in other college populations.

Chapter III

Method

Subjects

A two-group survey method was used. One hundred five subjects between the ages of 20 to 35 and 50 to 65, in a state supported southwestern university with a 14,000 student enrollment, participated in the study. The university is located in a "college" town with a population of 50,000 near a large metroplex area. There were a total of 108 participants of which three did not complete requirements because dietary intake would not be typical due to attendance at meetings. Participants were volunteer faculty, students, and other university employees including librarians and secretaries. The sample consisted of any volunteer between the stated ages

Table 1

Description of Sample

Age Group	Male	Female	Total
20-35	28	26	54
50-65	26	25	51
Total	54	51	105

until a total of 25 males and 25 females were obtained in each age group to ensure a total of 100 subjects. A description of the sample is shown in Table 1. Subjects were promised a report of findings and a copy of laboratory tests (Appendix A).

Procedure

A planned meeting (Appendix B) was held with the eight (8) persons to be involved in attendance. Posters (Appendix C) asking for volunteers were posted on bulletin boards throughout the university campus. The coordinator, a paid student, scheduled six (6) appointments on each of eighteen (18) days designated for data collection allowing fifteen (15) minutes between appointments (Appendix D). A record of persons in each age range and sex was maintained by the coordinator in order to obtain the appropriate number of subjects in each category.

Data was collected at the university's Speech and Hearing Center with adjoining rooms designated as Questionnaire and Health Station using temporary signs. The coordinator supervised the completion of the questionnaires, while the investigator was responsible for the health station. As a control and to eliminate a possible source of variability, the investigator collected the blood pressure, weight, height, pulse and health history (Appendix E) of

all subjects. Questionnaires used were the 1974 revision of Holmes and Rahe Recent Life Changes Questionnaire and Rotter's Interpersonal Trust Scale (General Opinion Survey). Fasting blood samples for determination of cholesterol, triglycerides and blood chemistry (SMAC-20) were drawn one week following the clinical measures with return of the nutrition diary (Appendix F) at this time.

Instruments

Interpersonal Trust Scale: The Interpersonal Trust Scale of Rotter (1967, Appendix G) was used to measure interpersonal trust. It consists of a 40-item additive scale which utilizes a Likert type format. The scale has 25 items which requires an expression of the extent to which the respondent trusts parents, friends and other social objects. Two hundred ninety-nine female and male psychology students were involved in the standardization with group administration of the Interpersonal Trust Scale and the Marlowe-Crowne Social Desirability Scale. A relatively low correlation with the Marlowe-Crowne Social Desirability Scale and a reasonable spread over the 5 Likert categories were required for an item to be included in the final version. The purpose of the scale is disguised.

The internal consistency of the Interpersonal Trust Scale is based on split-half reliability corrected by the Spearman-Brown formula. For males and females combined,

it has a mean of 72.41 and standard deviation of 10.90.

> While these consistencies are not high for objective type tests...these are additive scales sampling a variety of different social objects rather than a measure of intensity limited to a narrow area of behavior. Regarded in this light these internal consistencies are reasonably high (Rotter, 1971).

The test-retest reliability has a correlation coefficient of .68 at .01 level. There are important differences in administration procedures and long periods of time between tests indicating stability of test scores (Rotter, 1971). Evidence of the discriminant and convergent validity of the construct and measurement of interpersonal trust is provided by Cash, Stack, and Luna (1975).

The Interpersonal Trust Scale has been validated in a number of laboratory settings, with questionnaires, self-reports, and peer ratings (Wright & Maggied, 1975). The scale has received construct validation (Rotter, 1971). In investigating the convergent and discriminant validation for the Interpersonal Trust Scale and exploring its relationship to other measures of personality, Garske found the total trust score a better predictor of personality than any of its factor scores (Garske, 1976).

Holmes & Rahe Recent Life Changes Questionnaire: The 1974 revision of Holmes & Rahe Recent Life Changes

Questionnaire was used to measure the impact of life events (Holmes & Rahe, 1967, Appendix H). The items consist of 43 life events empirically derived from clinical experience and tested with 394 subjects. Consensus concerning the order and magnitude of the means of items has a coefficient of correlation (Pearson's r) above 0.90 except that between white and black which is 0.82. For the 394 subjects, Kendall's coefficient of concordance was 0.477, significant at $p = 0.0005$. The Recent Life Changes Questionnaire has been used worldwide with many people of varying ages, races, social classes and religions (Askenasy & Dohrenwend, 1977).

Ethical Considerations

Prior to implementation of the study, all subjects were given a description and explanation of the investigation including the purpose and nature, benefits, discomforts and risks with the understanding that permission could be withdrawn at any time. An informed consent form was signed by each subject (Appendix I).

Statistical Analyses

Test scores were computed by the investigator. Nutrient analyses were performed through the College of Nutrition with IBM Seq 7576. Descriptive statistics were

performed by the investigator with Hewlett Package 9825A. The specific programs were mean, standard deviation, and standard error; and t-test for unpaired data. Correlations were computed by the investigator.

Chapter IV

Results

Clinical

Interpersonal trust was correlated with life events and each of the selected coronary heart disease risk factors. These correlations are presented in Table 2. Subjects with missing data were dropped. A two-tailed test of significance was used for all Tables. To determine how much of the variance in one variable can be explained by scores of the second variable, r^2 a coefficient of determination was computed. As revealed in Table 2, there is a significant negative relationship between interpersonal trust and diastolic blood pressure of older subjects, r (98) = -.37, $P < .01$, with 13% of the variance accounted for. Table 2 also reveals a significant negative relationship (r (103) = -.26, $P < .01$) between interpersonal trust and body mass index of older subjects with 6.7% of the variance accounted for. A significant negative relationship is presented between trust and exercise for younger subjects, r (103) = .27, $P < .01$, with 7.2% accountable variance in exercise by knowledge of interpersonal trust scores.

Table 3 presents the means, standard deviations, t and r_{pb} values of the two age groups on interpersonal trust, life events and the selected coronary heart disease risk factors.

Table 2

Pearson r Correlations Between Interpersonal Trust and Life Events and the Selected Coronary Heart Disease Risk Factors for Younger and Older Subjects

Variable	Age Group	Pearson r	r^2
Life Events	Younger	.25*	6.2 %
	Older	.05	.25%
Smoking	Younger	-.14	1.00%
	Older	.17	2.00%
Blood Pressure Systolic	Younger	.05	.25%
	Older	-.09	.81%
Blood Pressure Diastolic	Younger	.06	.36%
	Older	-.37**	13.00%
Pulse	Younger	.08	.64%
	Older	-.17	3.00%
Pulse Pressure	Younger	.02	.04%
	Older	-.15	2.00%
Mean Arterial Pressure	Younger	-.04	.16%
	Older	-.07	.49%
Body Mass Index	Younger	.11	1.2 %
	Older	-.26***	6.7 %
Exercise	Younger	-.27**	7.2 %
	Older	-.02	.04%

*p < .05
**p < .01

Subjects with missing data were dropped. There were 54 subjects in the younger, 20 to 35 year age group; and 46 subjects in the older, 50 to 65 year age group. Significant differences were found between younger and older subjects on all variables except pulse, although it approached significance. A two-tailed test of significance was used with an r_{pb} computed on all significant t-values using formula

$$r_{pb} = \sqrt{\frac{t^2}{t^2 + df}}$$

(Cohen, 1974, p. 33). The mean interpersonal trust score for the younger group was 113.87 while the mean interpersonal trust score for the older group was 104.07. A significant difference was found between the interpersonal trust scores of younger and older subjects, t (98) = 2.68, $P < .01$. There is a weak relationship between the level of trust and age group with 6% of the variance of trust accounted for, $r_{pb} = .26$, $r^2pb = 6\%$.

The mean recent life event scores of the younger group was 277.62 and the older group was 129.32. A significant difference between recent life event scores for younger and older subjects was found, t (98) = 3.67, $P < .001$. A moderate association exists between recent life

event score and subject's age group, r_{pb} = .34. Eleven percent of the variance is accounted for, r^2pb = 11%.

Coronary heart disease risk factor in Table 3 reveals the mean exercise of younger subjects to be 18.55 while that of older subjects was 10.37 with the differences significant, t (98) = 3.03, P < .01, association mild, r_{pb} = - 29, and eight percent of the variance accounted for, r^2pb = 8%. Smoking as a factor of risk indicated a mean of 0.42 for the younger group and 0.84 for the older group with significant differences between the groups, t (98) = -2.15, P < .05, weak association, r_{pb} = .21, and 4% accountable variance, r^2pb = 4%. The systolic blood pressure for the younger subjects revealed a mean of 113.26 while older subjects' mean systolic blood pressure was 125.74 with differences in the means significant, t (98) = -4.67, P < .001; a moderate association, r_{pb} = .43; and 18% of the variance in systolic blood pressure accounted for by knowing the age group, r^2pb = 18%. The mean of the diastolic blood pressure of the older group was 83.66 and the younger group 77.00, with differences significant, t (98) = -3.74, P < .001, association moderate, r_{pb} = .35; and 12% of the variance accounted for. Younger subjects had an average pulse rate of 72.77 beats per minute; those of the older age group had beats at the

Table 3

Descriptive Statistics, t-values and Point Biserial Correlations of Age Groups on Variables

Variable	Age Group	Mean	Standard Deviation	t-value	r_{pb}	r^2_{pb}
Trust	Younger	113.87	12.89	2.68**	.26	6%
	Older	104.07	19.98			
Life Events	Younger	277.62	239.90	3.67***	.34	11%
	Older	129.32	137.82			
Exercise	Younger	18.55	17.71	3.03**	.29	8%
	Older	10.37	8.39			
Smoking (No. of Packs)	Younger	0.42	0.81	-2.15*	.21	4%
	Older	0.84	1.09			
Blood Pressure Systolic	Younger	113.26	12.04	-4.67***	.43	18%
	Older	125.74	14.31			
Blood Pressure Diastolic	Younger	77.00	8.12	-3.74***	.43	12%
	Older	83.66	9.47			
Pulse	Younger	72.77	11.22	-1.95		
	Older	76.67	8.67			
Pulse Pressure	Younger	36.19	10.04	-2.81**	.27	7%
	Older	42.26	11.34			
Mean Arterial Pressure	Younger	87.15	13.02	-4.60***	.42	17%
	Older	97.73	0.90			
Body Mass Index	Younger	0.03	0.0040	-4.93***	.44	19%
	Older	0.035	0.0058			
Family History	Younger	0.30	0.7171	-2.77**	.26	6%
	Older	0.78	0.98			

*p < .05
**p < .01
***p < .001

Note: r_{pb} (Cohen, 1974, p. 33)

rate of 76.67 per minute which were not significant, t (98) = -1.95, $P < .10$. The older group had a higher mean pulse pressure of 42.26 in comparison to the younger group's 36.19 with differences significant, t (98) = -2.81, $P < .01$, association weak, $r_{pb} = .27$ and accountable variance 7%, $r_{pb}^2 = 7\%$. Older subjects also had a higher mean arterial pressure with the average for the group 97.73, while the younger subjects' average was 87.15; the difference was significant, t (98) = 4.60, $P < .001$; moderate relationship, $r_{pb} = .42$; and 17% variance accounted for, $r_{pb}^2 = 17\%$. Mean body mass index for the older group was .035 and for the younger group, .030 with a significant difference, t (98) = -4.93, $P < .001$, moderate relationship, $r_{pb} = .44$, and 19% accountable variance, $r_{pb}^2 = 19\%$. Genetic differences by family history revealed the mean of older subjects to be 0.78 while that of younger subjects was 0.30, with the difference significant, t (98) = -2.77, $P < .01$, relationship weak, $rpb = .26$ and 6% accountable variance, $r^2pb = 6\%$.

In Table 4, a correlation coefficient indicated a significant relationship between life events and interpersonal trust (r (103) = .23, $P < .05$); a significant relationship between life events and age (r (103) = -.40, $P < .01$) and a significant negative relationship between interpersonal

trust and age, r (103) = -.35, $P < .01$. As indicated in Table 4, 5% of the variance in life events can be accounted for by knowing the interpersonal trust score, (r^2 = 5%); 16% of the variance in life event scores can be accounted for by knowing the age, (r^2 = 16%); and 12% of the variance in interpersonal trust scores can be accounted for by knowing the age (r^2 = 12%).

Table 4

Correlation Matrix of Life Events, Trust and Age

	Life Events		Trust		Age	
	r	r^2	r	r^2	r	r^2
Life Events	1.0	1.0	.23*	5%	-40**	16%
Trust			1.0	1.0	-.35**	12%
Age					1.0	1.0

*$P < .05$
**$P < .01$

Descriptive statistics and t-values with r_{pb} of significant values of clinical measures by sex with all subjects combined are shown in Table 5; of interpersonal trust, life events and clinical measures for subjects, ages 50 to 65 are shown in Table 6; and the same values for subjects, ages 20 to 35 are shown in Table 7. Table 5 indicates a significant difference between males and females on mean arterial pressure (t (96) = -2.22, $P < .05$); systolic blood

pressure (t (96) = -2.21, $P < .05$); and diastolic blood pressure (t (96) = -2.29, $P < .05$), indicating a significant decrease for females; with weak associations, (r_{pb} = .21 to .23); and 4 to 5% accountable variance (r^2pb = .4 to .5%). As indicated in Table 6, females, ages 50 to 65, had a significantly higher pulse rate per minute than males, (t (96) = 2.27, $P < .05$), with a moderate

Table 5

Descriptive Statistics and t-values with r_{pb} of Subjects Combined by Sex on Mean Arterial Pressure, Systolic and Diastolic Pressure for all Subjects

Variable	Sex	Mean	Standard Deviation	t-value	r_{pb}	r^2Pb
Mean Arterial Pressure	Male	95.04	8.09	-2.22*	.22	4.8%
	Female	90.60	11.39			
Systolic Blood Pressure	Male	121.96	10.98	-2.12*	.21	4%
	Female	115.96	16.80			
Diastolic Blood Pressure	Male	82.11	7.76	-2.29*	.23	5%
	Female	78.00	10.20			

*$P < .05$

relationship between pulse and sex (r_{pb} = 0.33) and 10% of variance in pulse accounted for by knowledge of the sex (r^2pb = 10%). For subjects ages 20 to 35, a significant difference exists between the pulse pressure of males and females, t (52) = -2.35, $P < .05$; between the mean arterial

pressure, t (52) = -3.94, $P < .01$; between systolic blood pressure, t (52) = -4.04, $P < .001$; and between diastolic blood pressure; with females being significantly lower; moderate relationship, r_{pb} = 31 to 49, and 9% to 24% accountable variance, r_{pb}^2 = 9% to 24%.

Table 6

Descriptive Statistics, t-values and Correlations of Subjects Ages 50 to 65 on Interpersonal Trust, Life Events and Clinical Measures

Variable	Sex	Mean	Standard Deviation	t-values	r_{pb}	r^2_{pb}
Pulse	Female	85.50	23.54	2.27*	.33	10%
	Male	72.27	9.45			
Pulse Pressure	Female	48.00	4.23	-1.08		
	Male	40.36	9.25			
Mean Arterial Pressure	Female	106.36	29.18	-.168		
	Male	97.99	8.60			
Systolic	Female	138.36	37.38	.537		
	Male	124.54	12.74			
Diastolic	Female	90.18	24.27	-.68		
	Male	84.54	7.91			
Trust	Female	111.50	29.51	-1.40		
	Male	107.63	12.03			
Life Events	Female	177.40	152.02	.45		
	Male	123.65	192.99			

*$P < .05$

Table 7

Descriptive Statistics, t-values and Correlations of Subjects Ages 20 to 35 on Interpersonal Trust, Life Events and Clinical Measures

Variable	Sex	Mean	Standard Deviation	t-value	r_{pb}	r^2_{pb}
Pulse	Female	64.07	26.76	.68		
	Male	72.41	11.14			
Pulse Pressure	Female	28.07	14.19	-2.35*	.31	9%
	Male	38.62	8.19			
Mean Arterial Pressure	Female	73.01	29.84	-3.94**	.48	23%
	Male	92.74	7.91			
Systolic Blood Pressure	Female	91.86	37.83	-4.04***	.49	24%
	Male	119.03	10.56			
Diastolic Blood Pressure	Female	63.66	26.29	2.82**	.33	10%
	Male	79.73	7.86			
Inter-personal Trust	Female	100.14	41.07	- .81		
	Male	135.24	115.00			
Life Events	Female	249.61	246.08	.54		
	Male	254.64	222.39			

*$P < .05$

**$P < .01$

***$P < .001$

Nutrient

Nutrient analysis of average 7-day total food intake is shown in Tables 8 and 9. Table 8 reveals the average 7-day carbohydrate intake for the older group was 178.06 grams, the younger group 176 grams; protein intake for older group 63.66 grams and 61.95 for the younger age group; fat intake for the older group was 60.30 grams; the younger group consumed 63.11 grams of fat; older subjects

Table 8

Descriptive Statistics and t-values of the Average Seven Day Nutrient Intake for the Two Age Groups

Food Intake	Age Group	Mean	Standard Deviation	t-value
Carbohydrate (Gm)	Younger Older	176.00 178.06	73.37 72.06	0.14
Protein (Gm)	Younger Older	61.95 63.66	20.92 13.69	-0.44
Fat (Gm)	Younger Older	63.11 60.36	24.17 18.23	-0.63
Cholesterol (Mg)	Younger Older	302.43 301.71	134.02 153.71	-0.02

consumed 60.36 grams of fat; older subjects consumed an average of 301.71 milligrams of cholesterol, while younger subjects consumed 302.43 milligrams. None of the t values were significant. Pearson r correlations were computed on interpersonal trust scores and average 7-day nutrient

intake. These values are shown in Table 9. As Table 9 reveals, for older subjects, there is a significant negative relationship between level of interpersonal trust and average grams of carbohydrates consumed in a 7-day period, r (42) = -0.34. Average of a 7-day intake of cholesterol for older subjects approached significance, r (42) = -.20.

Table 9

Pearson r Correlations Between Trust and Nutrients

Nutrient	Age Group	r	r^2
Protein (Gm)	Younger	0.01	.01%
	Older	0.07	.49%
Carbohydrate (Gm)	Younger	0.09	.81%
	Older	-0.34*	11.00%
Fat (Gm)	Younger	0.01	.01%
	Older	0.07	.49%
Cholesterol (Mg)	Younger	0.04	.16%
	Older	-0.20	4.00%

*P < .05

Biochemical

Results of abnormal findings of blood determinations are shown in Figure 2. Twenty-two subjects had high serum iron levels, 14 had increased CO_2 levels and 13 had elevated creatinine levels. None of the subjects had elevated cholesterol levels, while 5 subjects had low cholesterol levels. Eighteen subjects had elevated levels of serum

triglycerides as shown in Figure 3.

Mean and standard deviations were computed on blood values for each age group (Table 10). Table 10 presents the mean values as follows: mean high density lipoprotein (LDH) for younger group 151.20, for older group 180.34; mean creatinine for younger group 1.00, for older group 1.22; mean uric acid for younger group 5.41, for older group 5.66; mean cholesterol for younger group 173.78, for older group 202.21; mean low-density lipoprotein cholesterol (LDL) for younger group 114.26, for older group 131.92.

To determine if there were significant differences between level of interpersonal trust and biochemical measures, t-tests were computed. Separate means and standard deviations were computed for the interpersonal trust scores in each group prior to computing t-tests. All values were significant except LDL cholesterol, while LDL cholesterol of the younger group approached significance, t (106) = 1.67, $P < .10$, $r_{pb} = .16$, $r^2pb = 2\%$. For the younger and older age groups, significant differences were found between LDH and level of interpersonal trust with greater differences in the older age group, t (94) = 16.58, $P < .001$, a strong relationship, $r_{pb} = .85$, and 72% accountable variance $r^2pb = 72\%$; for the younger group, t (106) = 9.13,

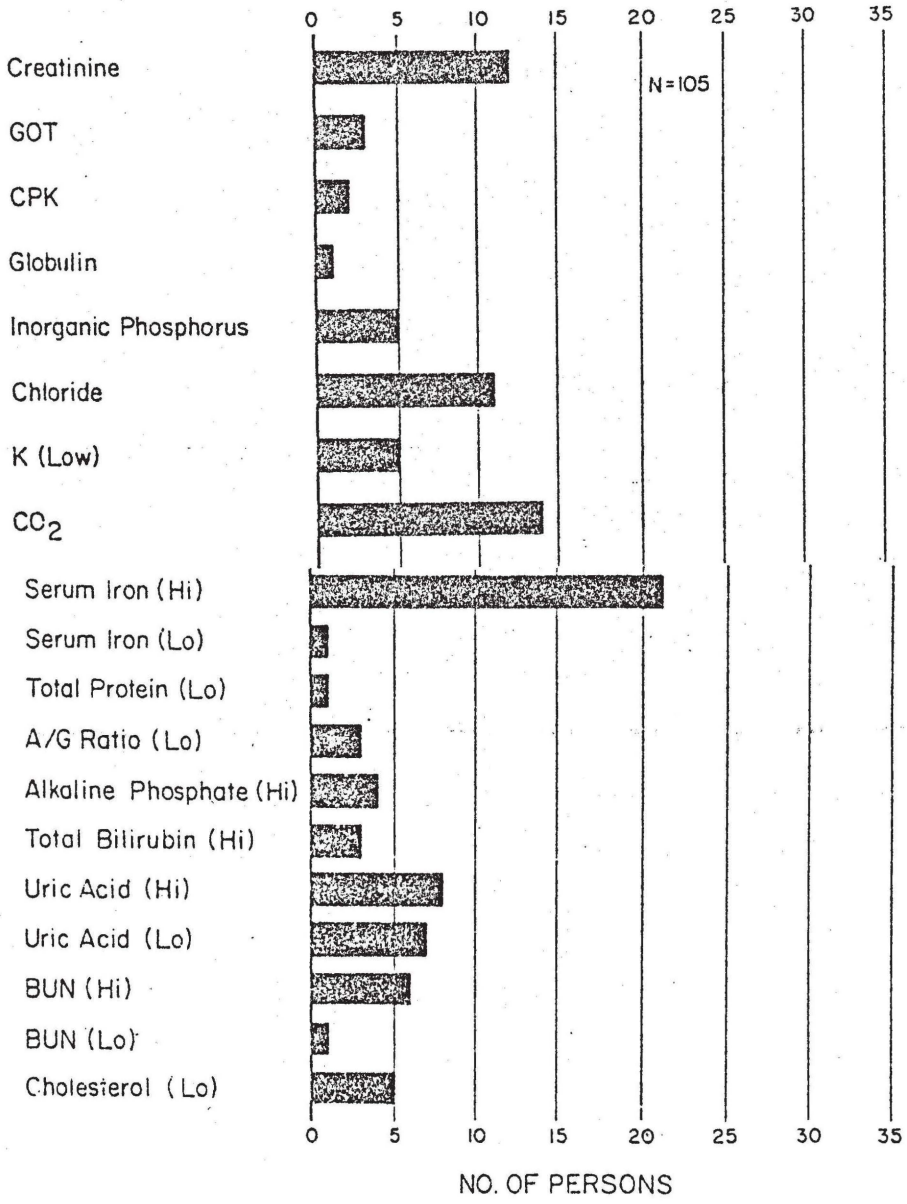

Figure 2. Subjects' Abnormal Blood Value Levels

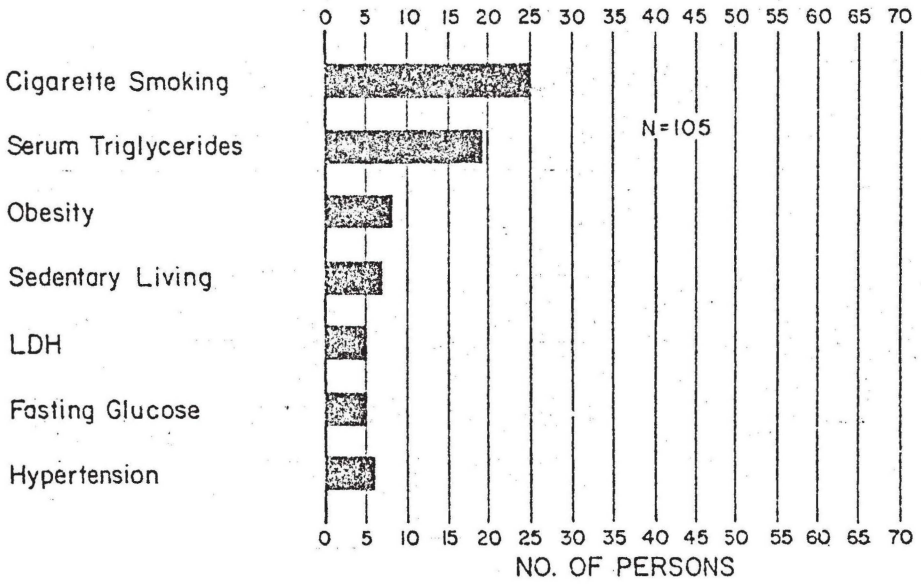

Figure 3. Selected Coronary Heart Disease Risk Factors of Subjects

$P < .001$, moderate association, $r_{pb} = .66$, with 44% of variance accounted for.

The largest differences between level of interpersonal trust and biochemical blood variables were creatinine for the younger age group, t (106) = -84.20, $P < .001$ with a strong negative relationship, $r_{pb} = .99$, and variance accounted for 98%; for the older age group, as the level of interpersonal trust decreased significantly,

Table 10

Descriptive Statistics and t-values of Age Groups on Level of Interpersonal Trust and Biochemical Variables

Biochemical Blood Value	Age Group	Mean	Standard Deviation	t-value	r_{pb}	r^2_{pb}
LDH	Younger	151.20	27.02	9.13***	.66**	44%
	Older	180.34	27.68	16.58***	.85**	72%
Creatinine	Younger	1.00	.05	-84.20***	.99**	98%
	Older	1.223	1.049	-51.71***	.98**	96%
Uric acid	Younger	5.41	1.47	-67.79***	.97**	95%
	Older	5.666	1.388	-27.33***	.93**	88%
Cholesterol	Younger	173.78	27.91	12.42***	.77**	59%
	Older	202.21	30.56	17.53***	.87**	75%
LDL Cholesterol	Younger	114.26	23.48	1.67*	.16*	2%
	Older	131.92	33.147	.5007		

*$P < .10$
**$P < .01$
***$P < .001$

the level of creatinine increased, $\underline{t}$ (94) = -51.71, $\underline{P}$ < .001 with a strong negative relationship, $\underline{r}_{pb}$ = .98, and variance in trust from knowledge of creatinine level 96%, $\underline{r}^2pb$ = 96%.

A significant negative difference was found between level of interpersonal trust and serum level of uric acid for both age groups with the greater difference in the younger age group (Table 10), $\underline{t}$ (106) = -67.79, $\underline{P}$ < .001, strong relationship, $\underline{r}_{pb}$ = .97, with 95% accountable variance; for the older age group also as the level of interpersonal trust increased, the level of uric acid decreased, $\underline{t}$ (94) = -27.33, $\underline{P}$ < .001 with a strong relationship, $\underline{r}_{pb}$ = .95, which accounts for 88% of the variance, $\underline{r}^2pb$ = 88%.

Significant differences were found between the level of interpersonal trust and level of cholesterol for both groups although cholesterol levels were within normal limits, for the older group, $\underline{t}$ (94) = 17.53, $\underline{P}$ < .001, with a moderately strong relationship, and 87% of the variance in interpersonal trust scores accounted for by cholesterol level.

$\underline{T}$-values of differences between the age groups on biochemical variables are shown in Table 11. Significant differences were found between the two groups on high-density lipoproteins (LDH, $\underline{t}$ (100) = 5.31, $\underline{P}$ < .001, relation-

ship moderate, r_{pb} = .47, with accountable variance 22%; between the two groups on low-density lipoprotein (LDL) cholesterol, t (100) = 3.08, P < .01, weak relationship, r_{pb} = .29, 8% variance accounted for; between the two groups on cholesterol, t (100) = 4.88, P < .001, moderate relationship, r_{pb} = .44, and 19% of variance accounted for.

Pearson r correlations between level of interpersonal trust as indicated by trust scores and biochemical blood values are shown in Table 12, with significant relationship between interpersonal trust and uric acid for the

Table 11

T-values of Age Groups on Biochemical Blood Variables

Biochemical Variable	t-value	r_{pb}	r^2_{pb}
LDH	5.31***	.47	22%
Creatinine	1.47*		
LDL Cholesterol	3.08**	.29	8%
Uric Acid	.88		
Cholesterol	4.88***	.44	19%
Serum Iron	1.06		
Potassium	-1.42		
Carbon Dioxide	-2.86***	.276	7%
Sodium	-2.94**	.283	8%

*P < .20
**P < .01
***P < .001

older group, t (94) = .20, with 4% variance in level of interpersonal trust accounted for by levels of serum uric

Table 12

Pearson r Correlation Between Level of Interpersonal Trust and Biochemical Blood Variables

Blood Value	Group	Pearson r	r^2
LDL Cholesterol	Younger	.05	.25%
	Older	.02	.04%
Uric Acid	Younger	.07	.49%
	Older	.20*	4.00%
Cholesterol	Younger	.05	.25%
	Older	-.33**	11.00%
Creatinine	Younger	-.18	3.04%
	Older	.17	2.56%
Serum Iron	Younger	.15	2.00%
	Older	.39*	15.00%
Potassium	Younger	.07	.49%
	Older	.01	.01%
Carbon Dioxide	Younger	.13	1.69%
	Older	.13	1.69%
Sodium	Younger	.07	.49%
	Older	.07	.49%

*$P < .05$

**$P < .01$

acid. Pearson r correlation of cholesterol level was significant negatively for the older group, indicating that as interpersonal trust level increases there is a decrease in serum level of cholesterol, t (94) = -.33, P

< .01, with 11% of variance in interpersonal trust accounted for by knowledge of cholesterol level.

There is a significant relationship between level of interpersonal trust and serum iron level of older subjects, r (94) = .39, P < .01, as shown in Table 12.

In Table 13, descriptive statistics for blood values of iron, potassium, carbon dioxide and sodium are shown for younger and older subjects. T-values were computed between these means and the mean of interpersonal trust for each age group. All of the t-values were significant (P < .001) except serum iron and interpersonal trust for the younger age group.

Table 13

Descriptive Statistics, t-values and Correlation of Age Groups on Interpersonal Trust & Biochemical values

Biochemical Variable	Age Group	Mean	Standard Deviation	t-value	r_{pb}	r^2_{pb}
Serum Iron	Younger	123.17	29.40	1.63		
	Older	129.20	40.45	3.88***	.35	12%
Potassium	Younger	4.06	.311	-73.03***	.98	96%
	Older	4.13	.3937	-48.327***	.96	92%
Carbon Dioxide	Younger	26.79	2.66	-56.27***	.96	92%
	Older	27.74	2.505	-36.54***	.93	86%
Sodium	Younger	139.04	2.47	16.28***	.71	50%
	Older	139.97	1.96	11.97***	.60	36%

***P < .001

Health History

Results from subjects' health histories are shown in Figures 3, 4, 5, and 6. As shown in Figure 3, coronary heart disease risk factors most prevalent in this sample were cigarette smoking with 25 subjects, triglycerides as mentioned earlier and sedentary living.

In Figure 4, cardiovascular illness was second to allergies in frequency with 17 subjects. In the time prior to 1978-1979, 28 subjects reported illness in the cardiovascular category. For 1978-1979, the illness reported most frequently for parents and/or siblings was cardiovascular with the frequency increasing from 43 to 70 for the time prior to 1978 as shown in Figure 5. Emotional illness was reported by four subjects and 12 parents and/or siblings as Figure 6 reveals.

Evaluation of Formal Hypotheses

Hypothesis I. Pearson product moment correlation coefficient was applied to interpersonal trust acores and recent life change scores. Pearson's r (103) = .23 $P <$ .05 (Table 4) allows for rejection of Part a of the null hypothesis at .05 level of significance. Pearson's r between interpersonal trust scores and coronary heart disease risk factors yielded significant findings for body mass

r (103) = .26, P < .01, for exercise r (103) = .27, P < .01 and for diastolic blood pressure, r (103) = .37, P < .01 which leads to a rejection of part b of the null hypothesis at the .01 level of significance. Based on the findings, Hypothesis I is rejected at the .05 level of significance.

Hypothesis II. The Pearson product moment correlation coefficient was applied to scores of interpersonal trust and life events and coronary heart disease risk factors of subjects ages 50 to 65; the coefficient obtained was .05 for life events and is not significant. Coefficient obtained for coronary heart disease risk factors of diastolic blood pressure was r (98) = -.37, P < .01, and body mass index, r (103) =-.26, P < .01. On the basis of this analysis, part a of hypothesis II is accepted; part b of the hypothesis is rejected at the .01 level of significance.

Hypothesis III. Pearson product moment correlation between scores of interpersonal trust and life events and coronary heart disease risk factors of subjects ages 20 to 35 yielded a coefficient of r (98) = .25, P < .02 for life events; and of coronary heart disease risk factor, exercise yielded a coefficient of r (103) = -.27, P < .01. Hypothesis III was rejected on the basis of this analysis.

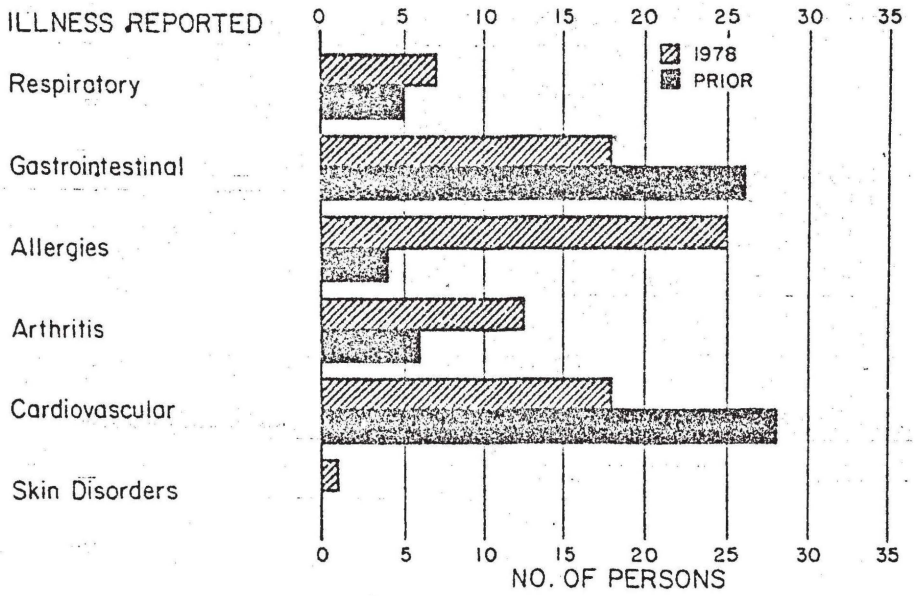

Figure 4. Subjects' Psychophysiological Reactions in Major Categories (Based on Hebert)

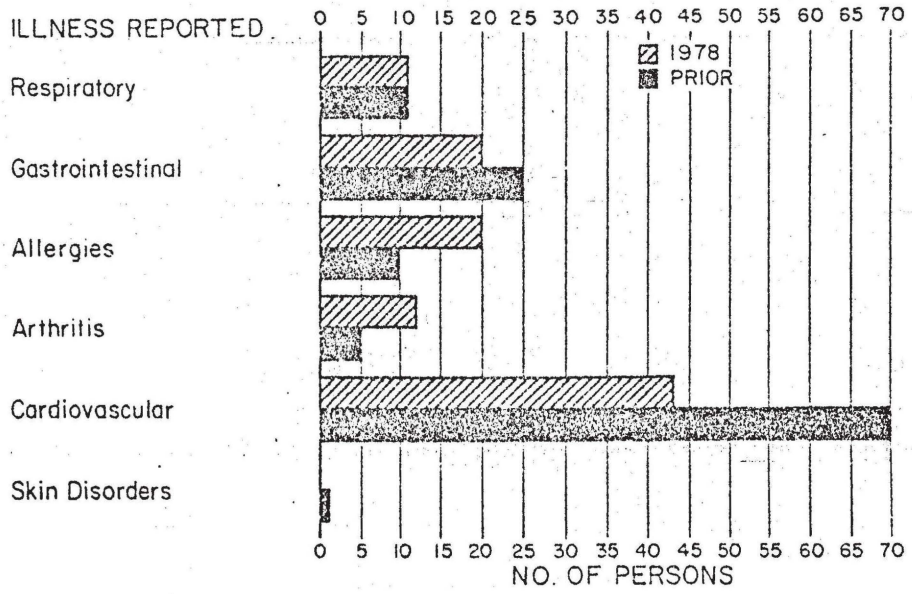

Figure 5. Parents/Siblings' Psychophysiological Reactions in Major Categories

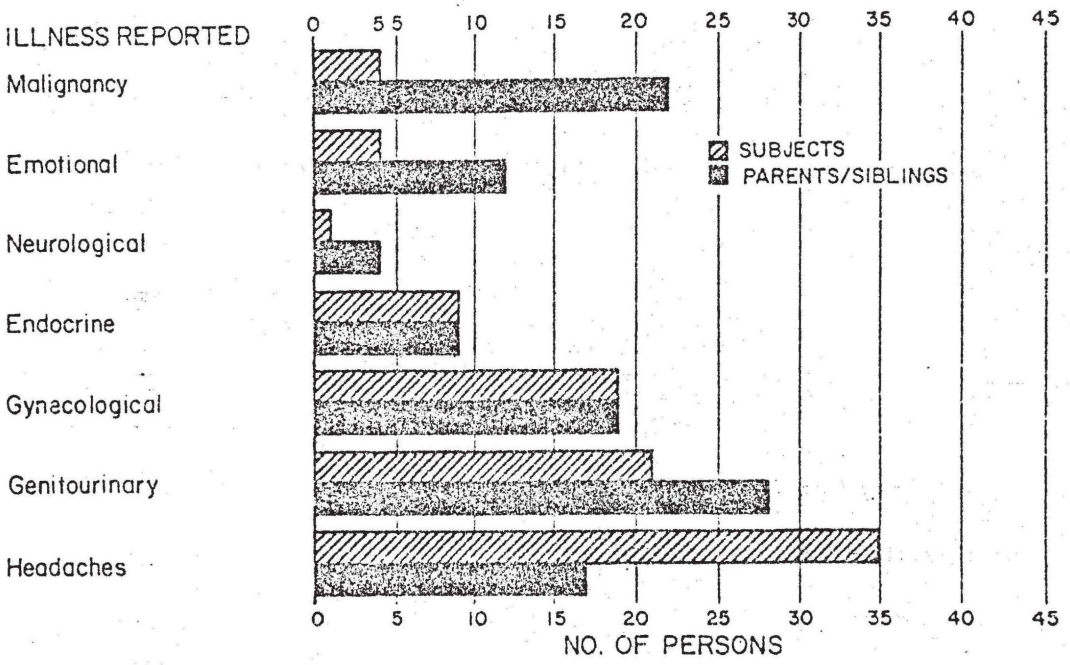

Figure 6. Subjects and Parents/Siblings' Psychophysiological Reactions in Other Categories

Hypothesis IV. Significant differences were found between subjects ages 20 to 35 and subjects ages 50 to 65 on interpersonal trust, t (98) = 2.68, $P < .01$, on life event scores, t (98) = 3.67, $P < .001$; on coronary heart disease risk factors of exercise, t (98) = 3.03, $P < .01$; smoking, t (98) = -2.15, $P < .05$; systolic blood pressure t (98) = -4.67, $P < .005$; diastolic blood pressure, t (98) = -3.74, $P < .001$; pulse pressure, t (98) = -2.81, $P < .01$; mean arterial pressure, t (98) =-4.60, $P < .001$; and family history, t (98) = -2.77, $P < .01$. Hypothesis IV was rejected on the basis of this analysis.

Hypothesis V. Pearson's product moment correlation coefficient revealed significant relationship between interpersonal trust scores and diastolic blood pressure, r (103) = .37, $P < .01$; between interpersonal trust scores and uric acid, r (94) = .20, $P < .05$; and between interpersonal trust scores and cholesterol, r (94) = -.33, $P < .01$. The hypothesis is rejected at the .05 level.

Hypothesis VI. Pearson product moment correlation between interpersonal trust scores and clinical measures of subjects ages 20 to 35 yielded the following: systolic blood pressure r (103) = .05; diastolic blood pressure r (103) = .06; pulse r (103) = .08; pulse pressure, r (103)

= .02; and mean arterial pressure r (103) = .04. None of the values were significant. Coefficients of interpersonal trust and biochemical values yielded the folowing: LDL cholesterol r (106) = .05; uric acid r (106) = .07, cholesterol r (103) = .05, creatinine r (106) = -18. None of these values were significant. On the basis of these findings, hypothesis VI is accepted.

Hypothesis VII. Pearson product moment correlations of interpersonal trust and clinical and biochemical measures of subjects ages 50 to 65 resulted in a significant negative correlation, r (98) = -.37, $P < .01$), between interpersonal trust scores and diastolic blood pressure; between interpersonal trust scores and uric acid level, r (94) = .20, $P < .05$; and between interpersonal trust scores and cholesterol level, r (94) = -.33, $P < .01$. Hypothesis VII is rejected at the .05 level based on the findings.

Hypothesis VIII. The t-tests revealed significant differences between interpersonal trust scores and clinical and biomedical measures of subjects ages 20 to 35 and subjects ages 50 to 65. Significant differences were found between systolic blood pressure, t (98) = -2.15, $P < .05$; diastolic blood pressure, t (98) = -3.74, $P < .001$; pulse

pressure, t (98) = -2.81, $P < .01$; and mean arterial pressure, t (98) = 4.60, $P < .001$. Significant differences were found between the following biochemical measures: high-density lipoprotein, t (100) = 5.31, $P < .001$; low-density lipoprotein (LDL) cholesterol, t (100) = 3.08, $P < .01$ and cholesterol, t, (100) = 4.88, $P < .001$. On the basis of this analysis, hypothesis VIII is rejected.

Hypothesis IX. Pearson product moment correlation between interpersonal trust and dietary intake yielded values which were not significant except for carbohydrate intake of subjects ages 50 to 65, r (82) = -0.34, $P < .05$; between interpersonal trust and biochemical measures of uric acid, r (94) = .20, $P < .05$; and of cholesterol, r (94) = -.33, $P < .01$. This hypothesis is rejected at the .05 level of significance.

Hypothesis X. A coefficient of r (100) = .01 for protein, r (100) = .09 for carbohydrate, r (100) = .01 for fat and r (100) = .04 for cholesterol was found between interpersonal trust and dietary intake. None of the values were significant. A coefficient of r (106) = .05 for LDL cholesterol, of r (106) = .07 for uric acid, of r (106) = =.18 for creatinine was found between interpersonal trust and biochemical measures. None of the values are significant. Hypothesis X is accepted based on the analysis.

Hypothesis XI. Pearson product moment correlation between interpersonal trust and dietary intake of subjects ages 50 to 65 yielded a coefficient of r (84) = -.34, $P < .05$ for carbohydrates; between interpersonal trust and biochemical measures of uric acid, r (94) = 20, $P < .05$, and of cholesterol r (94) = -.33, $P < .01$. Hypothesis XI is rejected at the .05 level of significance.

Hypothesis XII. A t-test of differences between interpersonal trust and dietary intake of subjects ages 20 to 35 and subjects ages 50 to 65 revealed the following for dietary intake: carbohydrate t (82) = .13, protein t (82) = -.44, fat r (82) = -.63, cholesterol t (82) = -.12. None of the values are significant. A t-test of differences between interpersonal trust and biochemical measures of the two age groups revealed the following values: LDH t (100) = 4.31, $P < .001$; LDL cholesterol t (100) = 3.08, $P < .01$; and cholesterol t (100) = 4.88, $P < .001$. On the basis of the analysis, there is no statistically significant difference between interpersonal trust and dietary intake of subjects in the two age groups, part a of the hypothesis is accepted. Findings of a significant difference between interpersonal trust and biochemical measures leads to rejection of part b of the hypothesis at the .01 level of significance. Part a of the hypothesis XII is

accepted; part b of the hypothesis is rejected.

Conclusions

A statistically significant relationship exists between interpersonal trust and life events.

A statistically significant relationship exists between interpersonal trust and coronary heart disease risk factors: diastolic blood pressure, body mass index, exercise, age, and carbohydrate intake.

A statistically significant relationship exists between interpersonal trust and the following blood values: uric acid, cholesterol, high-density lipoprotein, low-density lipoprotein and serum iron.

A statistically significant difference exists between the level of interpersonal trust, of subjects ages 20 to 35 and subjects ages 50 to 65, and exercise, smoking, systolic blood pressure, diastolic blood pressure, pulse pressure, mean arterial pressure, body mass index and family history.

A statistically significant difference exists between subjects ages 20 to 35 and subjects ages 50 to 65 on: trust, life events, exercise, smoking, systolic blood pressure, diastolic blood pressure, pulse pressure, mean arterial pressure, body mass index and family history.

Chapter V

Discussion

This study was an attempt to provide empirical data for the existence of a constellation of social, psysiological and psychological measures which identify persons at high risk for interpersonal trust alterations and coronary heart disease. A second purpose was to determine the norms for younger and older adults. The relationship between interpersonal trust, life events and coronary heart disease risk factors were examined. The differences between persons ages 20 to 35 and persons 50 to 65 were also examined.

The hypotheses fall into three categories: hypothesis I to IV, V to VIII and IX to XII. They will be discussed according to these categories.

Hypotheses I to IV. These hypotheses state there is no significant relationship between interpersonal trust and life events and coronary heart disease risk factors of subjects; of subjects ages 50 to 65; of subjects ages 20 to 35 and that there is no significant difference between the two groups on the measures.

The hypotheses were rejected by findings of statistical significance. Statistically significant correlation

coefficients were found between interpersonal trust and life events ($P < .05$), between interpersonal trust and diastolic blood pressure and body mass index (negative $P < .01$) of persons ages 50 to 65; and between interpersonal trust and exercise (negative $P < .01$) of persons ages 20 to 35.

Hypotheses V to VIII. The hypotheses state there is no significant relationship between interpersonal trust and clinical and biochemical measures of subjects; of subjects ages 20 to 35; of subjects 50 to 65; and that there is no significant difference between the two age groups on the measures.

The hypotheses were rejected by findings of significant correlation coefficients between interpersonal trust and diastolic blood pressure ($P < .01$); between interpersonal trust and high-density lipoprotein, creatinine, uric acid, and cholesterol ($P < .01$); statistically significant relationships between interpersonal trust and uric acid ($P < .01$) and cholesterol ($P < .01$) of subjects ages 50 to 65. No statistically significant relationship was found between interpersonal trust and biochemical variables for subjects ages 20 to 35. Older subjects had higher mean values for all biochemical blood measures.

Hypothesis IX to XII. These hypotheses state there is

no significant relationship between interpersonal trust, dietary intake and biochemical measures of subjects; of subjects ages 20 to 35; of subjects ages 50 to 65; and that there is no significant difference between the two groups on the measures. No statistically significant differences were found between interpersonal trust and dietary intake of subjects ages 20 to 35. A significant negative relationship between interpersonal trust and carbohydrate intake ($P < .05$) of subjects ages 50 to 65 indicates that high trusters consumed fewer carbohydrates. No statistically significant difference was found between the dietary intake of the two groups.

Significant relationships ($P < .01$) were found between the level of interpersonal trust and high-density lipoprotein, creatinine, uric acid, cholesterol, potassium, carbon dioxide and sodium for subjects ages 20 to 35 and subjects ages 50 to 65.

In both groups subjects with a high level of interpersonal trust had significantly lower ($P < .001$) creatinine levels, significantly lower ($P < .001$) uric acid levels and significantly higher ($P < .001$) high-density lipo-protein (LDH).

This study is based on a natural experiment. It is not as precise, as well controlled or as clear-cut as

planned experiments. Yet, the first step for the solution of major problems regarding interpersonal trust is the study of nature's experiments.

Interpersonal trust was not consistently significantly correlated to the coronary heart disease risk factors. These findings may indicate a relatively healthy sample as noted by mean bio-medical and clinical measures. Interpersonal trust as a psychological process may not be involved in the development of the risk factors. This is understandable since paranoid psychosis and myocardial infarction follow severe stress but rarely in the same person. A consistent finding of Holston (1977, p. 87) was that none of the psychological variables significantly correlate to the risk factor variables of cholesterol and blood pressure.

Significant correlations were found between interpersonal trust and variables of older subjects. A significantly higher negative correlation (.01) between interpersonal trust and body mass index of older subjects may indicate that with an increase in body weight relative to height, there is a decrease in the level of interpersonal trust. A significant negative correlation (.01) between interpersonal trust and diastolic blood pressure for older subjects may indicate that the higher the level of interpersonal trust, the lower the diastolic blood pressure due

to less stress. A significant decrease (.05) in average carbohydrate intake for persons with a high level of interpersonal trust indicates that high trusters consume less carbohydrates. High trusters in the older age groups also have a lower level of cholesterol as indicated by a significant negative correlation between interpersonal trust and blood cholesterol. Significant correlations for older subjects may be due to the natural process of aging.

Findings of significant correlations between interpersonal trust and life events (stress) suggest interpersonal trust as an important variable influencing neurophysiological adaptation. Life event changes as stress is a universal human phenomenon exerting a tremendous influence on health and behavior. For health promotion, an understanding of variables influencing health and high level wellness is necessary. If the person is essentially healthy or apparently healthy, then the nurse provides services through the health maintenance activities (Burgess, 1978, p. 23). Measures to promote or reinforce health or positive adaptive responses, to protect or retain the health of the person through health maintenance activities are important to nursing. Stress can increase creativity, motivation, productivity and satisfaction. Unpleasant

stress or distress from frustrating and difficult struggles leaves irreversible chemical scars which accumulate to form the aging process.

Theoretically, a decrease in the level of trust mobilizes resources in response to the situation causing increased maintenance needs and biochemical changes. Although chemical indices of stress have not been determined (Selye, 1976), significant findings of a relationship between interpersonal trust and biochemical blood values may have implications for studies in this area. A decreased level of interpersonal trust may produce biochemical changes. Persons with a low level of interpersonal trust would encounter more stressful emotions which could enhance catecholamine secretion thus increasing myocardial oxygen needs. Catecholamine secretion may produce a rise in triglycerides (Turner & Ball, 1973).

All subjects had normal or below normal cholesterol, while 18 subjects had high triglycerides. Blood samples were drawn after a fasting period of 12 to 15 hours. For younger subjects, ingestion of triglycerides by diet would be absorbed; however, in the older age group dietary triglycerides may not have all been removed. It has been found that in an older age group, removal of triglycerides may take up to 24 hours (Latner, 1975, p. 98).

High serum triglycerides may be a precursor to coronary heart disease. Triglycerides are neutral fats, the storage lipid of animals, consisting of three molecules of fatty acids esterified to a molecule of glycerol. Glycerol is allied chemically and metabolically to carbohydrates. Studies have suggested that highly refined carbohydrates, particularly sucrose, when substituted for starch, lead to an increase in the concentrations of serum triglycerides (Goodhart & Shils, 1975, p. 698).

Many lipids are combined with proteins as lipoproteins. When carbohydrate is present as a high percentage of total calories, there is a rise in the concentrations of lipoproteins. This has been attributed to the accumulation of triglycerides synthesized endogenously from carbohydrate (Goodhart & Shils, 1975). Increasing the frequency of carbohydrate ingestion from a fixed amount three times daily to six times daily results in reduced insulin requirements for diabetics. Frequent carbohydrate ingestion has resulted in lower concentrations of serum cholesterol. The only significant dietary intake correlation was between interpersonal trust and carbohydrates for older subjects. As a nutrient carbohydrate may have great potential for understanding aging.

The high blood iron may be due to greater than need

intake, diets with too much iron, or iron from overload may come from cooking pots as with the Bantu (Goodhart & Shils, 1975, p. 320).

The leading illness reported by subjects prior to 1978 to 1979 was cardiovascular. For parents and/or siblings, the leading cause of illness was cardiovascular with the frequency increasing prior to 1978. This finding confirms previous findings on the prevalence of cardiovascular disease (Stamler, 1979; Kannel & McGee, 1969). As the number of persons and time increase, there is a subsequent increase in the prevalence of cardiovascular illness.

A significant difference between the mean life event scores of younger and older subjects ($\underline{t} = 3.67$, $\underline{P} < .001$) may indicate improved coping styles for older subjects. Muhlenkemp, Gress and Flood (1975) found significant differences between elderly subjects ages 65 to 84, and the normative sample, with the elderly assigning the larger magnitude to life event changes. The group ages 50 to 65, may deal with stress using techniques which could be applicable to the younger group, ages 20 to 35, and to older persons, ages 65 to 84. As shown in Table 4, with increased age there is a decrease in the magnitude of life events which indicates less stress for subjects ages 50

to 65. This may also indicate that middle adulthood is a time of job and financial security, fewer purchases all pointing toward decreased economic problems.

The theoretical consequences of significant findings between trust and life events (t (103) = .23, $P < .05$) and between trust and age (r (103) = -.85, $P < .01$) indicates the importance of trust as a variable influencing neurophysiological adaptation. If trust occurs as a result of social learning then it is possible to increase as well as decrease the level of interpersonal trust. If trust is a protective factor against illness, then increasing the level of trust of low trusters will contribute to maintenance of high level wellness. Effective use of what is presently known about the sources of ill health could vastly reduce unnecessary suffering and the frequency of premature deaths. Improvements in health will not be achieved by curative measures but by changes in the social structures and behavior patterns.

Sex was one of the independent variables in this study. In this sample, females, ages 50 to 65, have higher mean values on pulse, pulse pressure, mean arterial pressure, systolic blood pressure, diastolic blood pressure, interpersonal trust and life events. In the 20 to 35 age group, males had higher mean values on all of the same measures.

This finding may have implications for nursing assessments of level of interpersonal trust, life events and clinical measures in younger males and older females.

Implications

A statistically significant correlation between interpersonal trust and life events may have implications for assessing recent life events and level of interpersonal trust. These assessments could provide a good estimate of the person's adaptive status. Persons at risk could be identified and appropriate intervention techniques designed since recent life event values are supported as valid predictor variables. Knowledge of life event change, how it is perceived, and the level of interpersonal trust may allow the nurse to increase the person's tolerance for further change without rendering behavioral consequences manifested by functional health changes. Functional health changes could be coronary heart disease or mental illness, diseases of adaptation. Techniques for relaxation could be instituted such as stress innoculation training, Transcendental Meditation, Yoga, Zen, sentic cycles, hypnosis and related practices. Future studies could focus on the effects of relaxation on the cardiovascular system and the level of interpersonal trust.

Recent life changes may predict higher percentages of persons who will develop coronary heart disease during the following year than is possible with currently used risk factors. Future longitudinal studies could observe which persons develop coronary heart disease focusing on life events as stress.

Further insight and knowledge into human dynamics are provided by these findings of association between interpersonal trust and life events. Life event changes as related to stress needs emphasis in health care today. Knowledge of the association between interpersonal trust and life event changes can assist nurses. Nurses are challenged to consider the relationship of interpersonal trust and life event changes to health maintenance and illness prevention. In some situations life event changes can be selected. With knowledge of recent life event changes or stressors, the nurse can help the individual maintain stress within safe limits. Inclusion of life event change questionnaire in a nursing assessment can assist the nurse with health maintenance education. This is an important step toward illness prevention.

Based on the findings of this study, it would appear that older persons are a high-risk group for a low level of interpersonal trust or a nursing diagnosis of mistrust.

Consideration of this factor could assist in assessment, planning and implementation of nursing care.

A statistically significant finding that level of interpersonal trust decreased with age may have important implications for individual and group psychotherapy. This study's results generally suggest that older persons have a low level of trust. It might be more important that nurses consistently keep their word or promise in order that trust be maintained than would be the case with younger persons or persons with a high level of interpersonal trust. Neistein (1977) found that high trusters are more willing to tolerate and/or forgive untrustworthy behavior than low trusters without it adversely affecting their trust. Psychotherapy consists of alleviating anxiety and thereby minimizing the biochemical and structural changes which occur as a result of stress. The general adaptation syndrome of Selye with the alarm reaction indicates how organ pathology can be produced by stresses of any nature, including symbolic threats. Psychopathological manifestations very closely parallel organic pathology and is observed in the final appearance of neurosis and psychosis (Yacorzynski, 1952). It is not primarily the stress but the biochemical and structural changes within the body as a result of the stress. Events consist of

symbolic threats which produce biochemical and structural changes within the body. If measures are taken to prevent a decrease in the level of interpersonal trust, then stress requiring an adaptive response can be prevented.

Trust is an important interpersonal factor. A person may respond to stress through cognitive behaviors of mentally thinking about the situation. Quietly thinking through a situation alone can promote problem solving and can also provide anxiety release. In addition to the positive effects of thinking, negative effects are also possible. A decrease in the level of interpersonal trust can occur in thinking to relieve ego tension. This can be observed in premonition as the person becomes aware of a plot in the development of a delusion. Anxiety is relieved as the focus becomes attributed to something outside of the self. Future studies could focus on how a decrease in the level of interpersonal trust becomes pathological.

Generally, serum cholesterol levels tend to rise with age and high density lipoprotein cholesterol levels usually fall. Findings of this study provide evidence that a high level of interpersonal trust is associated with an increase in high density lipoprotein. This is an important discovery since high density lipoprotein has been correlated with

relative protection from coronary heart disease (Eaton, 1978). A high level of interpersonal trust is also associated with lower cholesterol levels which decrease the risk of coronary heart disease development.

Previous research with the interpersonal trust scale indicates that subjects with a low level of interpersonal trust are more suspicious than persons with a high level of interpersonal trust (Wright & Maggied, 1975). A high level of interpersonal trust produces a general sense of well-being in the bodily system thereby decreasing the psysiological tendency to defend against threat. Older subjects in this study had a low level of interpersonal trust, therefore they would be more suspicious than younger subjects. Higher clinical variables are associated with a low level of interpersonal trust. A high diastolic blood pressure, systolic blood pressure, pulse pressure and mean arterial pressure occur as a result of the alarm reaction and the stage of resistance of the general adaptation syndrome. These findings are consistent with those of Rogers (1961).

The significant finding of a negative relationship between level of interpersonal trust and average grams of carbohydrates consumed by older subjects in a 7-day period is important to help unravel the role of nutrition in aging.

The identification of nutrients associated with level of interpersonal trust provide knowledge of mechanisms which could lead to the development of rational and effective dietary approaches for improving health and survival during advancing years.

The findings of a significant decrease in the level of interpersonal trust with age is of extreme importance because of the loss of adaptive mechanisms during aging. With knowledge and understanding of the level of interpersonal trust, methods can be instituted to decrease tension involved in physiological adaptation. Low trust mobilizes the body's nonspecific adaptive system with biochemical changes in serum levels of carbon dioxide, sodium, potassium and cholesterol. The body reacts in maintaining homeostasis and living in satisfying equilibrium with its surroundings when the level of interpersonal trust decreases. Catecholamines are discharged that increase diastolic blood pressure, while the entire nervous system becomes alarmed and tense in anticipation. Interpersonal trust is a coordinated psychophysiological process of assured anticipation.

A high level of interpersonal trust is associated with decreased risk of coronary heart disease development. A coordinated physiological process is produced which maintains a steady state. With a high level of interpersonal

trust, a natural homeostasic mechanism maintains a normal state of resistance. When the level of interpersonal trust decreases, defense is raised to a heightened level as heterostasis establishes a new steady state by stimulating physiologic adaptive mechanisms.

Interpersonal trust passes through the three stages of the general adaptation syndrome as alterations occur. The body reacts in maintaining homeostasis as defensive adaptive responses.

Future studies

High level wellness and health care improvement rest with an understanding of casual relationships in man-environment interactions. It is suggested that the present study be repeated using three age groups 15 years apart. In addition to the 20 to 35 age group and 50 to 65 age group, an 80 to 95 age group should be instituted to determine the relationship between interpersonal trust and life events and coronary heart disease risk factors over a greater life span. The present study could be repeated in several universities in different sections of the country to further substantiate or repudiate the present findings. The 35 to 50 age group could be included in the study. The study could be repeated using a more "normal"

population.

Longitudinal studies of interpersonal trust, and life events, and coronary heart disease risk factors during development periods beginning with adolescence could be instituted. The physiological indices could be determined at the time of occurrence and at varying periods.

The qualitative nature of trust in the nurse-patient relationship could be measured to explore which behaviors on the part of the nurse create feelings of distrust in patients. A modified Q-sort of responses to an open-ended statement could be used.

A study of the relationship of life events (stress) and trust and related concepts, namely hope and faith would add further clarification to an understanding of the dynamics of basic human needs.

Future theoretical and experimental research should consider the process and product of life events and diseases of adaptation.

Summary

A number of studies have established the relationship between life events and coronary heart disease. The present paper reports a study of the relationship between interpersonal trust, life events as stress and coronary

heart disease risk factors. A sample of 105 subjects in two groups, ages 20 to 35 and 50 to 65, were administered questionnaires regarding interpersonal trust and life events. Bio-medical data such as SMAC-20, health history, nutrition diary, blood pressure, pulse, weight, and height were also collected on each subject.

Rotter's Interpersonal Trust Scale and Holmes and Rahe Recent Life Change Questionnaire were administered to subjects. Selected instruments were correlated with clinical and biochemical variables. Differences between the two age groups on selected variables were determined.

Significant correlations were found between levels of interpersonal trust and life events, age and carbohydrate intake of older group.

Older subjects smoked significantly more packs of cigarettes per day than younger subjects. They also had statistically significant lower interpersonal trust scores, fewer life events, exercised less, had higher systolic and diastolic blood pressure, higher pulse pressure, higher mean arterial pressure, larger body mass index, higher serum iron and a larger family history of coronary heart disease. High trust in the older age group was significantly associated with lower cholesterol levels although cholesterol levels of all subjects were within the normal

range.

Younger subjects had statistically significant lower systolic and diastolic blood pressure, lower pulse pressure, smaller body mass index, smoked fewer packs of cigarettes per day and had a smaller family history of heart disease.

Females in general had a statistically significant lower mean arterial pressure, systolic blood pressure and diastolic blood pressure than males. Older females (50 to 65 years) had a significantly higher pulse, pulse pressure, mean arterial pressure, systolic and diastolic blood pressure, and higher life event scores than older (50 to 65 years) males. Younger females had significantly lower mean arterial pressure, systolic and diastolic blood pressure.

For both age groups, persons with high interpersonal trust scores had significantly higher serum sodium levels and significantly lower potassium and carbon dioxide levels.

Based on the findings of this study, interpersonal trust is defined as an endogenous coordinated socio-psycho-physiological process of assured anticipation involving motivational relevance and predictability, which unites man with others, yet permits him to be himself. It is a force comprising the emotional structure's organizing

element which breaks the boundaries of man's separateness, allowing him to retain his integrity without defenses or concealment. Interpersonal trust affects the body's reactivity to situations manifesting itself in biochemical and clinical change.

Findings of this study provide empirical evidence for the importance of interpersonal trust with persons ages 50 to 65. Findings also provide evidence of the importance of health assessments of relatively healthy persons for maintenance of high level wellness.

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Appendices

APPENDIX A

Dear

Thank you for participating in our research study to examine multiple sociopsychologic and physiologic correlates of stress in two age groups. The following results were noted:

BLOOD PRESSURE_____PULSE_____WEIGHT_____

HEIGHT_____

Attached is a copy of your laboratory results.

Since the results of your_____are not within normal range, we advise you to discuss these findings with your physician. The results of the other tests were within normal range.

The results of the tests were within normal range.

Sincerely,

APPENDIX B

AGENDA

Meeting of Researchers Involved in Stress Study to be Conducted March 20 - May 6

I. Introductory Remarks
Status of Volunteer Sign-up

II. Tour of Facility
Selection of "Station"

III. Explanation of Rotation of Volunteers

IV. Discussion of Means for Providing Results to Volunteers

V. Discussion of Human Subjects Form, Research Instruments and Coding Procedures

APPENDIX C

The Center for Studies in Aging NEEDS YOUR HELP if you are between 20-35 or 50-65 years of age

The Center for Studies in Aging is conducting a study to examine multiple socio-psychologic and physiologic correlates of stress in two age groups. The study design calls for 25 males and females age 20-35 and 25 males and females age 50-65 to volunteer for a single two-part data collection session. After the initial afternoon or evening session, expected to take less than 1 hour, the volunteer will be asked to return in the morning when a blood sample will be taken (requires 5-10 minutes time). STRICTEST CONFIDENTIALITY WILL BE MAINTAINED.

Those participating in the study will:

1) be asked to complete a health history, recent stressful events, general opinion questionnaire and habits of nervous tension checklist.
2) be asked to maintain a one week nutrition diary, i.e., keep a list of daily food intake.
3) have their blood pressure, weight and height recorded.
4) have one early morning (fasting) blood sample taken for the following determinations: total cholesterol, high-density lipo-protein cholesterol, triglycerides, and automated blood chemistry analysis (SMAC 20).

APPOINTMENTS ARE BEING SCHEDULES NOW. The data and blood samples will be collected at the NTSU Speech and Hearing Clinic with the diary returned to us at the end of one week.

Upon the completion of the data analysis, each volunteer WILL RECEIVE A COPY OF HIS/HER LABORATORY TEST RESULTS and will be informed if any of the other results of data analysis are outside the normal range. This can be a considerable savings as, for example, an automated blood chemistry analysis to rule out metabolic disorders plus the determinations listed above can cost approximately $58.00.

If you are interested in participating in this study, and/or have any questions, please contact Lessell White of Philippa Ann Hodge, Center for Studies in Aging.

APPENDIX D

DATA COLLECTION SCHEDULE

For_____

Name	Number	Time

APPENDIX E

Health History

1. Name_____ 2. Occupation_____

3. Sex_____male_____female 4-5. Age_____Years

6. Marital status (check) _____single _____married

_____separated _____divorced _____widowed

After each of the following items please respond in both columns using one of the following:

0 - None
1 - During the past year
2 - Over one year ago
3 - Not applicable
4 - Don't know

Condition present	Yourself	Parent(s) and/ or sibling(s)
7. Anemia		
8. Abnormal bleeding		
9. Asthma		
10. Hay fever		
11. Other allergy		
12. Tuberculosis		
13. Other chronic respiratory disease		
14. Thyroid disease or goiter		
15. Diabetes		
16. Obesity		
17. Epilepsy		
18. Emotional disorder		
19. Hemorrhoids		
20. Hernia		
21. Peptic ulcer		
22. Gall bladder disease		
23. Liver disease		
24. Prostate disease		
25. Kidney stones		
26. Kidney or bladder infection		
27. Kidney disease		
28. Rheumatic fever		
29. High cholesterol ____mg.%		
30. High blood pressure		
31. Low blood pressure		

	Yourself	Parent(s) and/ or sibling(s)
32. Heart disease	_____	_____
33. Heart attack	_____	_____
34. Stroke	_____	_____
35. Congenital heart disease	_____	_____
36. Arthritis or rheumatism	_____	_____
37. Fractures	_____	_____
38. Malignancy	_____	_____
39. Headaches	_____	_____
40. Gynecological problem	_____	_____

41-42. Age of father_____(at death if deceased)

43-44. Cause of death_____

45-46. Age of mother_____(at death if deceased)

47-48. Cause of death_____

49-50. Are you on a special diet? yes_____ no_____

If yes, what type?

Diabetes	____	For allergy	____
Caloric restriction	____	Modified fat	____
Na restriction, pregnant	____	Ulcer	____
Na restriction, other	____	High protein	____
For gaining weight	____	Renal	____
		Other	____

51. We are interested in your use of tobacco. Please tell us any periods in which you have used tobacco, the kind, and approximate amount. (Example, smoked/ pack/day from age 35 to 40.)

_____ _____
_____ _____
_____ _____

52. We are interested in your exercise pattern. Approximately how many hours per week do you engage in the following:

	Approximate hours per week						
	1 or less	2	3	4	5	6	7+
53. Strolling, 1MPH	___	___	___	___	___	___	___
Walking, 2 MPH	___	___	___	___	___	___	___
54. Golf, using power cart	___	___	___	___	___	___	___
55. Cleaning windows, mopping floor, vacuuming (continuously for 20-30 minutes)	___	___	___	___	___	___	___
56. Bowling	___	___	___	___	___	___	___
57 Walking, 3 MPH	___	___	___	___	___	___	___
Cycling, 5 MPH	___	___	___	___	___	___	___
58. Golf, pulling cart (walking briskly)	___	___	___	___	___	___	___
59. Scrubbing floors (in at least 2-minute stints)	___	___	___	___	___	___	___
60. Walking, 3.5 MPH	___	___	___	___	___	___	___
Cycling, 8 MPH	___	___	___	___	___	___	___
61. Golf, carrying clubs	___	___	___	___	___	___	___
62. Tennis, doubles (continuous play, 2-minutes at a time)	___	___	___	___	___	___	___
63. Walking, 4 MPH	___	___	___	___	___	___	___
Cycling, 10 MPH	___	___	___	___	___	___	___
Ice or roller skating (skating should be done continuously.)	___	___	___	___	___	___	___
64. Walking, 5 MPH	___	___	___	___	___	___	___
Cycling, 11 MPH	___	___	___	___	___	___	___
65. Tennis, singles (30 minutes or more)	___	___	___	___	___	___	___

	Approximate hours per week						
	1 or less	2	3	4	5	6	7+
66. Jogging, 5 MPH	____	____	____	____	____	____	____
Cycling, 12 MPH	____	____	____	____	____	____	____
67. Downhill skiing	____	____	____	____	____	____	____
68. Running, 5.5 MPH	____	____	____	____	____	____	____
Cycling, 13 MPH	____	____	____	____	____	____	____
69. Running, 6 or more MPH	____	____	____	____	____	____	____
70. Swimming	____	____	____	____	____	____	____
71. Other (Specify____)	____	____	____	____	____	____	____

72-75. Health Measures:

72. Blood pressure_____

73. Weight_____

74. Height_____

75. Pulse_____

APPENDIX F

NUTRITION DIARY

We are interested in correlating diet with some of our other research. Therefore, we would like you to keep a nutrition diary for us for 7 days. When completing the following forms, please indicate the foods eaten, the time, and the exact amount of each. Be sure to explain this fully (i.e., 1:15 p.m., skimmed milk; 1/2 cup). Include all snacks and beverages.

Name_____ Date_____ Day of Week____

Time	Food or Beverage	Amount

Is this a typical day? Yes_____ No_____

If not, reason_____

Time to Bed_____

APPENDIX G

Name_____

General Opinion Survey

This is a scale for measuring attitudes and beliefs on a variety of statements. Please answer the statements by giving as true a picture of your own beliefs as possible.

If you strongly agree with an item, write one in the space. Write two if you mildly agree with the item. That is, two if you think the item is generally more true than untrue according to your beliefs. Write three if you feel the item is about equally true as untrue. Write four if you mildly disagree with the item. That is, mark four if you feel the item is more untrue than true. If you strongly disagree with an item, write five in the space.

1. Strongly agree
2. Mildly agree
3. Agree and disagree equally
4. Mildly disagree
5. Strongly disagree

_____ 1. Most people would rather live in a climate that is mild all year around than in one in which winters are cold.

_____ 2. Hypocrisy is on the increase in our society.

_____ 3. In dealing with strangers one is better off to be cautious until they have provided evidence that they are trustworthy.

_____ 4. This country has a dark future unless we can attract better people into politics.

_____ 5. Fear of social disgrace or punishment rather than conscience prevents most people from breaking the law.

_____ 6. Parents usually can be relied upon to keep their promises.

_____ 7. The advice of elders is often poor because the older person doesn't recognize how times have changed.

_____ 8. Using the Honor System of not having a teacher present during exams would probably result in increased cheating.

_____ 9. The United Nations will never be an effective force in keeping world peace.

_____10. Parents and teachers are likely to say what they believe themselves and not just what they think is good for the child to hear.

_____11. Most people can be counted on to do what they say they will do.

_____12. As evidenced by recent books and movies, morality seems on the downgrade in this country.

_____13. The judiciary is a place where we can all get unbiased treatment.

_____14. It is safe to believe that in spite of what people say, most people are primarily interested in their own welfare.

_____15. The future seems very promising.

_____16. Most people would be horrified if they knew how much news the public hears and sees is distorted.

_____17. Seeking advice from several people is more likely to confuse than it is to help one.

_____18. Most elected public officials are really sincere in their campaign promises.

_____19. There is no simple way of deciding who is telling the truth.

_____20. This country has progressed to the point where we can reduce the amount of competitiveness encouraged by schools and parents.

_____ 21. Even though we have reports in newspapers, radio, and television, it is hard to get objective accounts of public events.

_____ 22. It is more important that people achieve happiness than that they achieve greatness.

_____ 23. Most experts can be relied upon to tell the truth about the limits of their knowledge.

_____ 24. Most parents can be relied upon to carry out their threats of punishment.

_____ 25. One should not attack the political beliefs of other people.

_____ 26. In these competitive times, one has to be alert or someone is likely to take advantage of you.

_____ 27. Children need to be given more guidance by teachers and parents than they now typically get.

_____ 28. Most rumors usually have a strong element of truth.

_____ 29. Many major national sport contenders are fixed in one way or another.

_____ 30. A good leader molds the opinions of the group he is leading rather than merely following the wishes of the majority.

_____ 31. Most idealists are sincere and usually practice what they preach.

_____ 32. Most salesmen are honest in describing their products.

_____ 33. Education in this country is not really preparing young men and women to deal with the problems of the future.

_____ 34. Most students in school would not cheat even if they were sure of getting away with it.

_____ 35. The hordes of students now going to college are going to find it more difficult to find good jobs when they graduate than did the college graduates of the past.

_____ 36. Most repairmen will not overcharge even if they think you are ignorant of their specialty.

_____ 37. A large share of accident claims filed against insurance companies are phony.

_____ 38. One should not attack the religious beliefs of other people.

_____ 39. Most people answer public opinion polls honestly.

_____ 40. If we really knew what was going on in international politics, the public would have more reason to be frightened than they now seem to be.

APPENDIX H

Holmes & Rahe Recent Life Changes Questionnaire: 1974 Revision

Check if this event occurred in the last six months		Please score (see end of scale for instructions)
	A. HEALTH	
	Within the time periods listed, have you experienced:	
_____	1. an illness which:	
	(a) kept you in bed a week or more, or took you to the hospital?	_____
	(b) was less serious than described above	_____
_____	2. a major change in eating habits?	_____
_____	3. a major change in sleeping habits?	_____
_____	4. a change in your usual type and/or amount of recreation?	_____
	5. major dental work?	_____
	B. WORK	
	Within the time periods listed, have you:	
_____	6. changed to a new type of work?	_____
_____	7. changed your work hours or conditions?	_____
_____	8. had a change in your responsibilities at work?	
	(a) more responsibilities?	_____
	(b) less responsibilities?	_____
	(c) promotion?	_____
	(d) demotion?	_____
	(e) transfer?	_____
_____	9. experienced troubles at work?	
	(a) with your boss?	_____
	(b) with co-workers?	_____
	(c) with persons under your supervision?	_____
	(d) other work troubles?	_____
_____	10. experienced a major business readjustment?	_____
_____	11. retired?	_____
_____	12. experienced being:	
	(a) fired from work?	_____
	(b) laid off from work?	_____

13. taken courses by mail or studied at home to help you in your work?

C. HOME AND FAMILY

Within the time periods listed, have you experienced?

14. a change in residence:
    (a) a move within the same town or city?
    (b) a move to a different town, city or state?
15. a change in family "get-togethers"?
16. a major change in the health or behavior of a family member (illnesses, accidents, drug or disciplinary problems, etc.)?
17. a major change in your living conditions (home improvements or a decline in your home or neighborhood)?
18. the death of a sponse?
19. the death of a:
    (a) child?
    (b) brother or sister?
    (c) parent?
    (d) other close family members?
20. the death of a close friend?
21. a change in the marital status of your parents?
    (a) divorce?
    (b) remarriage?

NOTE: (Questions 22-32 concern marriage. For persons never married go to Item 34.)

22. marriage?
23. a change in arguments with your spouse?
24. in-law problems?
25. a separation from spouse:
    (a) due to work?
    (b) due to marital problems?
26. a reconciliation with spouse?
27. a divorce?
28. a gain of a new family member:
    (a) birth of a child?
    (b) adoption of a child?
    (c) a relation moving in with you?

29. wife beginning or ceasing work outside the home?
30. wife becoming pregnant?
31. a child leaving home:
    (a) due to marriage?
    (b) to attend college?
    (c) for other reasons?
32. wife having a miscarriage or abortion?
33. birth of a grandchild?

D. PERSONAL AND SOCIAL

Within the time periods listed, have you experienced:

34. a major personal achievement?
35. a change in your personal habits (your dress, friends, life-style, etc.)?
36. sexual difficulties?
37. beginning or ceasing school or college?
38. a change of school or college?
39. a vacation?
40. a change in your religious beliefs?
41. a change in your social activities (clubs, movies, visiting?)
42. a minor violation of the law?
43. legal troubles resulting in your being held in jail?
44. a change in your political beliefs?
45. a new, close, personal relationship?
46. an engagement to marry?
47. a falling out of a close personal relationship?
48. girlfriend (or boyfriend) problems?
49. a loss or damage of personal property?
50. an accident?
51. a major decision regarding your immediate future?

E. FINANCIAL

Within the time periods listed, have you:

52. taken on a moderate purchase, such as a T.V., car, freezer, etc.)?
53. taken on a major purchase or a mortgage loan, such as a home, business, property, etc.?
54. experienced a foreclosure on a mortgage or loan?

_____ 55. experienced a major change in finances?
(a) increased income? _____
(b) decreased income? _____
(c) credit rating difficulties? _____

INSTRUCTIONS FOR SCORING YOUR ADJUSTMENT TO YOUR RECENT LIFE CHANGES:

Persons adapt to their recent life changes in different ways. Some people find the adjustment to a residential move, for example, to be enormous, while others find very little life adjustment necessary. You are now requested to "score" each of the recent life changes that you marked with an "x" as to the amount of adjustment you needed to handle the event.

Your scores can range from 1 to 100 "points." If, for example, you experienced a recent residential move but felt it required very little life adjustment, you would choose a low number and place it in the blank to the right of the questions. On the other hand, if you recently changed residence and felt it required a near maximal life adjustment, you would place a high number, toward 100, in the blank to the right of that question. For immediate life adjustment scores you would choose intermediate numbers between 1 and 100.

Please go back through your questionnaire and for each recent life change you indicated with an "x", choose your personal life change adjustment score (between 1 and 100) which reflects what you saw to be the amount of life adjustment necessary to cope with or handle the event. Use both your estimates of the intensity of the life change and its duration to arrive at your scores.

APPENDIX I

INFORMED CONSENT

NAME OF SUBJECT:

I hereby give consent to Dr. Cora Martin, Dr. Andras Lacko, Dr. Miriam Henoch, Dr. Margaret Dennis and Dr. William J. Jasper and their investigators to supervise my completion of paper and pencil tests measuring stress and general opinion in regards to interpersonal trust, to record my blood pressure, weight, height and family history and to have Dr. Andras Lacko draw one early morning (fasting) blood sample for determining: total cholesterol, hi-density lipo-protein cholesterol triglycerides and automated blood chemistry analysis.

I have heard a clear explanation and understand the nature and purpose of the investigation and the attendant discomforts or complications which might arise. I have seen a clear explanation and understand the benefits to be expected. I understand that the procedure is investigational and that I may withdraw my consent.

With my understanding of this, having received this information and satisfactory answers to questions I have asked, I voluntarily consent to complete the questionnaires and have the test and measures as indicated.

Signed:_____ Witness:_____

Date:_____ Date:_____

Note: No medical service or compensation is provided to subjects by the University as a result of injury from participation in research.