To the Graduate Council:

I am submitting herewith a dissertation written by John Stephen Jozwiak entitled "The Tennessee Self-Description Form and Correlates of Health." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Education.

Robert L. Williams

Robert L. Williams, Major Professor

We have read this dissertation and recommend its acceptance:

Schuyler W. Huck

Marka A. Hector

Sandra P. Thomas

Accepted for the Council:

C W Minkel

Vice Provost
and Dean of The Graduate School

THE TENNESSEE SELF-DESCRIPTION FORM AND CORRELATES OF HEALTH

A Dissertation

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Doctor of Philosophy

Degree

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John Stephen Jozwiak

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ABSTRACT

This study was conducted to explore the relationships between the work, social, health, and leisure areas of life style effectiveness contained in the Tennessee Self-Description Form and selected health indicator variables for an adult, nonclinical population. Indicator variables included fasting total serum cholesterol and triglyceride, locus of control, and the Type A behavior pattern.

A total of 462 subjects, representing 198 university faculty and staff, 156 registered nurses, and 108 nursing students, participated in the study. All respondents completed a series of questionnaires. Fasting total serum cholesterol and triglyceride levels were obtained through review of Operation Health Check records.

There were significant negative correlations found between the Tennessee Self-Description Form work, social, health, and total scores and the Speed and Impatience subscale score of the Jenkins Activity Survey. An additional significant inverse relationship was found between the Tennessee Self-Description Form social score and the global Type A score. Significant negative correlations, which indicated that an internal locus of control was associated with an increased Tennessee Self-Description Form life style effectiveness score, were determined for scores on Rotter's locus of control and the Tennessee Self-Description Form work, social, health, leisure, and total

scores. A comparison of fasting serum cholesterol and triglyceride levels between high score groups (greater than one standard deviation above the mean for normative data) and low score groups (lower than one standard deviation unit below the normative mean) for Tennessee Self-Description Form areas of life style effectiveness yielded no statistically significant differences with the exception of serum triglyceride level for the health score groups.

A factor analysis generally supported the initial placement of Tennessee Self-Description Form items into the work, social, and health areas of life style effectiveness. The leisure area was eliminated prior to factor analysis because a large amount of measurement error was associated with this area. A salient feature of the factor analysis was the absence of bipolar factors.

Initial validation of the Tennessee Self-Description Form for use as a research measure of life style as a health-specific construct has been presented. The findings of this study provided support for links between traditional life style risk factors and health that have been identified in previous research. Additionally, the results offered beginning evidence for the interrelationships between health and commonplace activities such as general patterns of work and social behavior. Implications for future research and practice are discussed.

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CHAPTER I

INTRODUCTION

Health care costs in the United States continue to rise at a rate that far exceeds the general rate of inflation. The cost of health care rose 7.7% in 1986, an increase that was seven times as large as the rise in the Consumer Price Index for all items. Health care expenditures have increased faster than the overall Consumer Price Index in each of the past six years, with 1986 representing the largest disparity between these two figures (Pear, 1987).

Health care expenses account for 10.8% of the Gross National Product (Cohen, 1985). This sizable investment has resulted from a number of major scientific and technical advances in areas such as transplant surgery, artificial organ development, and oncology, but there is general agreement that the large investment directed toward the acute care mode of the health delivery system has not produced corresponding gains in the overall health of the larger, nonclinical segment of the population (Cohen, 1985; Heffernan & Albee, 1985; Pell & Fayerweather, 1985).

During the past 25 years, there has been a growing awareness of the role life style plays in the prevention of disease and the enhancement of wellness (Stamler, 1985). Half of the mortality in the United States is attributed to

problems related to unhealthy life style; of the other half, 20% is due to genetic predisposition, 20% to environmental factors, and only 10% to deficiencies in the health care delivery system (Michael, 1982). A number of health care professionals have stated that the next major breakthrough in health care will come through changes in individual life styles, as a result of assessment and reduction of an individual's biological, social, environmental, and psychological risk factors (Berry, 1981; Pell & Fayerweather, 1985). If this breakthrough is to occur, individuals will need to assume control over the daily management of their lives.

During the past 10 years, the increased focus on life style and its relationship to wellness has led to a growing interest in the nature and application of self-direction and effective life style principles and techniques (Kanfer, 1977; Watson & Tharp, 1985; Williams & Long, 1983). Research has been directed toward helping the individual become more independent of the immediate environment and more able to effect personal behavior change in the face of strong antagonistic stimuli (Kanfer). The growing trend toward personal responsibility for one's health has led to success in the behavioral management of medical problems such as obesity (Stuart, Mitchell, & Jensen, 1981; Stunkard, 1979), chronic pain (Ziesat, 1981), and alcoholism

(Nirenberg, Ersner-Hershfield, Sobell, & Sobell, 1981). Self-direction and effective life style principles and strategies have been used successfully by researchers and clinicians to reduce the intensity of the time urgency phenomenon characteristic of the Type A behavior pattern (Chesney, Eagleston, & Rosenman, 1981; Friedman & Ulmer, 1984).

Researchers have found that there is a large degree of variability among individuals in their ability to assume responsibility for their personal health (Bellack & Schwartz, 1976). However, the vast majority of investigators have devoted little time to research aimed at an assessment of individual differences in effective management of life style for a nonclinical population. Instead, they have directed their research efforts toward application of various cognitive and behavioral strategies, using as clients those who presented with problems that had developed to a point at which their conduct of daily activities was noticably compromised (Karoly & Kanfer, 1982).

The development of a comprehensive measure of life style behaviors that are hypothesized to be related to physical and psychological health has been described by Williams, Jozwiak, Hector, and Young (1985). Initial investigation by Thomas (1983) into the relationships between dimensions of this instrument (known as the Tennessee Self-Description Form or TSDF) and health status

variables revealed that subjects with known cardiovascular disease scored below the overall sample mean on two of the five dimensions. Conceptually, the initial findings of Thomas are useful, but problems related to small sample size (n = 26) for the cardiovascular disease subsample and measurement during hospitalization have limited generalizability of the findings.

Preliminary investigations of the TSDF by Williams et al. (1985) and Young (1985) yielded normative data for subgroups hypothesized to be effective or ineffective managers. Whereas these data are useful, the properties of the TSDF have not been compared against validated health indicator variables. Additionally, a large percentage of each sample was composed of undergraduate students, thereby placing limitations on the external validity of these preliminary findings.

Statement of Problem

This study was conducted to explore the relationships between areas of life style effectiveness identified in the Tennessee Self-Description Form and selected health indicator variables for an adult population. These indicator variables included serum cholesterol and triglyceride, locus of control, and Type A behavior. The following subsidiary questions were investigated:

1. Will the Jenkins Activity Survey (JAS) scores of each scale be significantly negatively related to each area of life style effectiveness of the TSDF?

2. Will the Rotter's Locus of Internal-External Control (RI-ELC) score be significantly negatively related to each TSDF area of life style effectiveness?

3. Will the high TSDF score groups for all areas of life style effectiveness have significantly lower fasting serum cholesterol and triglyceride levels than the low TSDF score groups?

4. Will the TSDF leisure score be significantly positively related to the amount of time spent in leisure activity?

5. Will a factor analysis confirm the placement of TSDF items into the hypothesized areas of life style effectiveness?

6. Will the factors derived from a factor analysis have stronger relationships to the health indicator variables than the relationships found between the initially hypothesized areas of life style effectiveness and the indicator variables?

7. What degree of internal consistency and stability does the TSDF possess?

Need for the Study

Assessment of effective life style behaviors for a nonclinical population has received limited attention from

researchers. Increased emphasis on wellness makes it important that assessment of life style effectiveness be done to identify tendencies and behaviors before they progress to the major problem stage. The proposed study sought to extend validation efforts for an easily administered, relatively nonreactive instrument (the TSDF) for the purpose of identifying broad areas of life style that need to be changed to improve health in a nonclinical population.

Assumptions

1. The responses to all instruments were honest and accurate.

2. The variables chosen as indicators of health status were valid for that purpose.

3. The procedures used when administering the questionnaires were appropriate and acceptable methods for collection of data for the study.

Limitations

1. Use of a nonprobability sample limits the generalizability of the findings to those based on logical rather than probability estimates.

2. The sample was composed largely of persons of the Caucasian race who were employed in professional level jobs or preparing for such jobs through enrollment in a university program, further limiting generalizability.

3. The sample was drawn from a nonclinical population that may have been more health-conscious than usual because of their profession or attendance at a health screening.

4. A cross-sectional time frame was used.

Nominal Definitions

1. Adult: A male or female between 18 and 65 years of age.

2. Areas of Life Style Effectiveness: Behaviors that are categorized logically as work, social, health, or leisure activities.

3. Cholesterol: A type of animal fat manufactured by the body and also consumed in most diets.

4. Life Style: The sum of decisions made by an individual regarding daily activities that affect health and that can, at least in part, be controlled by the individual.

5. Locus of Control: A generalized expectancy that reflects the extent to which power to control personal events is ascribed to the individual.

6. Triglyceride: A type of fat manufactured by the body and also present in animal and vegetable dietary sources.

7. Type A Behavior: A pattern of behavior characterized by extremes of time urgency, impatience, job involvement, and competitiveness.

CHAPTER II

REVIEW OF LITERATURE

Introduction

Over the past 25 years, ever-increasing technological sophistication has enabled health care practitioners in this country to implement a rapidly growing list of complex and costly ways of treating illness; this often leads in turn to technical satisfaction, but frequently produces individual dissatisfaction (Milsum, 1984). Knowles (1977) aptly described an early manifestation of this situation when he characterized the status of health care and health care outcomes with the words "doing better but feeling worse". As a society, we have begun to realize that not only are we spending more and feeling worse, but also that health is not a commodity that can be purchased whenever it is needed.

During the past decade, health care costs have increased at a rate far exceeding both the Consumer Price Index and the Gross National Product (Cohen, 1985; Pear, 1987). These alarming increases, fueled by what has been described as an inexhaustible "need" for sick care, have served to stimulate a growing interest in health promotion and health maintenance (Milsum, 1984; Prokop & Bradley, 1981).

This emphasis on promotion of health, rather than treatment of disease, has been approached in two opposing fashions. One strategy, the passive approach (Engel, 1977), depends on mass application to obtain benefits in an economical way. A health promotion strategy such as this that fails to involve the individual in an active way is largely an extension of the invader-host theoretical model that has long been used as a basis for the practice of curative medicine (Milsum, 1984). This passive strategy tends to be inflexible in its application and reduces the individual's role to that of passive recipient of health services at the expense of individual motivation for personal responsibility.

The other strategy, which may be described as an active approach (Prokop & Bradley, 1981), depends on the individual becoming personally motivated to adopt and implement an individual health promotion program. The most direct examples of this strategy involve changes in life style, such as involvement in a program of physical activity or adoption of a stress management plan. The success of the active strategy ultimately depends on the ability of the individual to generate and maintain appropriate behaviors directed toward achievement of optimal health. Whereas application of passive strategies may be desirable at times, such approaches are best

incorporated into strategies in which the individual is the principal participant (Milsum, 1984).

Behavioral Health and Behavioral Medicine

An outgrowth of the recent interest in health promotion activities was the Yale Conference on Behavioral Medicine, held in 1977 (Keefe & Blumenthal, 1982). A group of behavioral and biomedical scientists working at the conference developed the following definition:

> Behavioral medicine is the field concerned with the development of behavioral science knowledge and techniques relevant to the understanding of physical health and illness and the application of this knowledge to prevention, diagnosis, treatment, and rehabilitation (Schwartz & Weiss, 1978, p. 7).

Although this definition highlights the interdisciplinary nature of behavioral medicine, Matarazzo (1980) suggested that behavioral medicine did not place enough emphasis on the maintenance of health and the prevention of illness and dysfunction. Matarazzo suggested a new specialty called behavioral health. This new specialty would focus on areas underemphasized in behavioral medicine. Matarazzo offered the following definition as a corollary to the definition of behavioral medicine:

> Behavioral health is an interdisciplinary field dedicated to promoting a philosophy of health that stresses <u>individual responsibility</u> in the application of behavioral and biomedical science knowledge and techniques to the <u>maintenance</u> of health and the <u>prevention</u> of illness and dysfunction by a variety of self-initiated individual or shared activities (Matarazzo, 1980, p. 813).

The definition proposed by Matarazzo is likely the more useful of the two because it provides the conceptual flexibility needed to incorporate the increasingly prominent involvement of the social and behavioral sciences in matters related to health. The focus on individual responsibility for health is consistent with theoretical models of self-regulatory behavior that have been advanced by several researchers (Bandura, 1977; Brown, Muhlenkamp, Fox, & Osborn, 1983; Conrad & Kern, 1981; Muhlenkamp & Sayles, 1986). Therefore, the concept of behavioral health may be viewed as central to the description and understanding of many health-related individual actions that are directed toward promoting or maintaining health.

Life Style Effects

The belief that what individuals do day after day may have a significant effect on their health is not new. The origin of the connection between health and proper living can be traced not only to the roots of our Western civilization but also to Chinese, Middle Eastern, and other ancient civilizations (Dubos, 1980). A common philosophical feature in each of these civilizations was recognition of the importance of sensible living in the prevention of illness (Berkman & Breslow, 1983).

The day-to-day activities in which individuals engage have been labeled collectively as life style. An exact definition of life style poses problems. From a commonsense

standpoint, it concerns how individuals live and the choices that they make. However, disagreements have developed over the limits of what constitutes life style; for example, should dimensions of life style be limited to those areas in which individuals have freedom of choice (Milsum, 1984)? The following definition of life style is offered for clarification:

> Life style is the sum of decisions by individuals that affect their health and that can, to some extent, be controlled by them; decisions that affect health negatively then create self-imposed risks, and in that sense individuals contribute to their own illness or death (Lalonde, 1975, p. 56).

Recent research as well as logical thinking offers support for the relationship between health and life style. Breslow and Enstrom (1980), in a review of the health promotion literature, confirmed the idea that engaging in poor health behaviors leads to earlier death and engaging in positive health behaviors leads to longer life. Other researchers, investigating the influence of specific risk factors such as tobacco use, excessive alcohol intake, and seat belt use on morbidity and mortality, have reported similar findings (Belloc & Breslow, 1972; Hubbard, Muhlenkamp & Brown, 1984; Mechanic & Cleary, 1980). Dever (1980) examined the 10 leading causes of death for adults in the state of Georgia and concluded that in 9 of these causes of death, accounting for 94% of all deaths, life style was the greatest contributing cause; only death due

to influenza and pneumonia was not chiefly dependent on life style.

Health Risk Appraisal

Examination of empirical support for the relationship between health and life style has led researchers to undertake development of instruments that would evaluate an individual's health status. Since the late 1950s, when the first health risk appraisal instrument was introduced, a variety of such instruments has been developed (Robbins & Hall, 1970). The underlying assumption behind use of these instruments is that they can enhance an individual's awareness of susceptibility to chronic disease and serve as a stimulus for needed change.

The number of health risk appraisal instruments has increased considerably in recent years as health researchers and practitioners increasingly have focused on ways to prevent debilitating disorders related to poor health behaviors (Beery, Wagner, & Schoenbach, 1981; Hyner & Melby, 1985; Wagner, 1982). This search for an inexpensive, noninvasive, individualized screening tool may serve to promote healthy behaviors and eliminate or delay expensive therapeutic interventions.

The first health risk appraisal instruments used demographic and physical measurement data supplied by the individual. Risk of dying within a specified time period was determined by comparisons of an individual's data to

mortality data in actuarial tables for population groups with similar risk factors (Hyner & Melby, 1985). These comparisons made it possible to generate a risk age and an attainable age for an individual. Since the risk factors used in the calculations were weighted prognosticators, an individual's risk age likely could be modified by changing specific behaviors linked to chronic disease. A continuing problem related to use of this type of risk appraisal is the need to collect data through use of physical measurements which may be costly and time consuming. Measurements such as detailed blood chemistries that require costly laboratory analysis or physical examinations that are time consuming and often costly are frequently needed for this type of health risk appraisal.

The majority of health risk appraisal instruments have focused on the mortality risk involved in maintaining behaviors such as tobacco use and excessive alcohol intake whose pathophysiological consequences have been thoroughly identified and described (Hyner & Melby, 1985; Milsum, 1984). Walker, Sechrist, and Pender (1987) reported on the development of an instrument designed to measure a health-promoting life style. Some of their items are similar to the TSDF items and refer to activities that can be done on a daily basis, such as goal setting and encouragement of others. However, other items such as checking cholesterol level and reporting symptoms to a physician are not

representative of day to day activities. Additionally, Walker et al. (1987) present no convergent or divergent validation for their instrument.

Few instruments focus entirely on life style (Greenberg, 1984; Travis, 1977). Each of these instruments has a problem associated with it. The instrument developed by Greenberg deals exclusively with life style behaviors that may generate stress, whereas the one developed by Travis only measures positive, health-enhancing behaviors.

Hyner and Melby (1985) suggest that an ideal health risk appraisal instrument should measure a broad spectrum of life style activities that are empirically related to health. They recommend that the instrument will be most valuable if it is used to enhance communication between the individual and the health practitioner. Such communication could then help in the development of a personalized plan for change to a life style more consistent with positive health.

Health Indicators

Type A Behavior Pattern

The Type A behavior pattern is an epidemiological construct that had its origin in the late 1950s when Friedman and Rosenman (1974) began to make systematic observations of cardiac patients they were seeing in their

private practice. These observations led to the following definition of the Type A behavior pattern:

> a characteristic action-emotion complex which is exhibited by those individuals who are engaged in a relatively chronic struggle to obtain an unlimited number of poorly defined things from their environment in the shortest period of time and, if necessary, against the opposing efforts of other things or persons in this same environment (Friedman, 1969, p. 84).

Rosenman (1978) has identified the central elements of the behavior pattern as extremes of easily aroused hostility, aggressiveness, job involvement, a sense of time urgency, and competitive achievement striving. Matthews (1982) described the Type A pattern as "a set of overt behaviors that is elicited from susceptible individuals by an appropriately challenging environment" (p. 293). These behaviors, which characterize the Type A pattern, are viewed conceptually as existing along a continuum of behaviors ranging from the extreme Type A to the extreme non-Type A or Type B.

A number of prospective research studies (Haynes, Feinleib, & Kannel, 1980; Haynes, Feinleib, Levine, Scotch, & Kannel, 1978; Rosenman et al., 1975) and cross-sectional research studies (Kornitzer, Kittel, & DeBacker, 1981; Stevens, Turner, Rhodewalt, & Talbot, 1984) have verified the hypothesis that the Type A behavior pattern is an independent risk factor for coronary heart disease. The magnitude of the risk is approximately equal to the risk

associated with other coronary heart disease risk factors such as smoking and hypertension. Additionally, individuals identified as possesssing the Type A behavior pattern have been determined to have approximately twice the rate of clinical coronary heart disease, twice the rate of fatal coronary events, and five times the rate of recurring coronary events when compared to individuals who did not have the Type A behavior pattern (Rosenman et al., 1975).

Early research on the Type A behavior pattern used male subjects (Rosenman et al., 1975). Recent studies of the Type A behavior construct using female subjects have replicated a number of the earlier findings (Dearborn & Hastings, 1987; Manning, Balson, Hunter, Berenson, & Willis, 1987).

Williams et al. (1980) proposed that additional understanding of the mechanisms relating Type A behavior and coronary heart disease could be gained by investigation of the relationship between components of the global Type A behavior pattern and various indices of coronary heart disease. Early research by Dunbar (1943) and Arlow (1945) had established a probable link between repressed or suppressed aggressive strivings and the development of coronary heart disease. More recent prospective investigations by Theorell, Lind and Floderus (1975) and Matthews, Glass, Rosenman, and Bortner (1977) have provided evidence that hostility is associated with the subsequent appearance

of clinical coronary heart disease. Williams et al. (1980) reported that individuals scoring high on a hostility scale showed a 70% rate of significant coronary heart disease. Multivariate analysis of their data indicated that both the Type A behavior pattern and hostility were independently related to the presence of atherosclerosis with hostility being more strongly related to arteriosclerosis than the Type A behavior pattern alone.

Lambert, MacEvoy, Klackenberg-Larsson, Karlberg, and Karlberg (1987) investigated the relationship between catecholamine and cortisol excretion and the Type A behavior pattern in a sample of young adults. They divided the Jenkins Activity Survey Speed and Impatience (Factor S) items into irritability and hurried behavior clusters on the basis of a factor analysis. Further analysis revealed significant positive correlations between the irritability items and epinephrine levels and the hurried behavior items and norepinephrine levels. Lambert et al. (1987) contend that the irritability component of Factor S is likely to be closest to the anger and hostility component of the Type A behavior pattern that has been identified as a significant risk factor by Matthews et al. (1977).

Although a large volume of research linking Type A behavior to coronary heart disease has been published, some researchers (Case, Heller, Case, & Moss, 1985; Ragland & Brand, 1988) have reported contradictory findings with

respect to Type A behavior as a coronary risk factor. Case et al. (1985) reported no relationship between Type A behavior and the long-term outcome of acute myocardial infarction. However, a number of researchers (Abbot, Peters, & Vogel, 1985; Friedman, 1985; Halperin & Littman, 1985; Ketterer, 1985) have identified methodological problems that could explain the contradictory findings. Among the problems cited were (a) sampling bias, (b) measurement error, and (c) the likelihood that risk factors for survival after a myocardial infarction are not the same as those that predict the first myocardial infarction.

Ragland and Brand (1988) studied the survival of 257 male patients with coronary heart disease from the initial 8.5 year phase of the Western Collaborative Group Study to determine whether behavior type was related to subsequent coronary heart disease mortality. In a comparison of Type A and Type B individuals, Ragland and Brand reported a lower mortality among Type A individuals in both younger and older subgroups. This apparent advantage was more pronounced in patients whose initial diagnosis was symptomatic myocardial infarction as opposed to silent infarction or angina pectoris.

As in the Case et al. (1985) study, there are some potential methodological shortcomings in the Ragland and Brand (1988) study. One potential problem cited by Dimsdale (1988) is the uncertainty involved in classification based

on median or mean splits. Another difficulty involves the use of retrospective data which are insensitive to any changes that might alter the classification of an individual along the Type A-B continuum. Dimsdale (1988) recommended further examination of Ragland and Brand's data set to determine whether the potential for hostility rather than the Type A behavior might be more strongly related to long-term survival of coronary heart disease. It is possible that the hostility component or some other subcomponent of the Type A behavior pattern is the more salient risk factor for coronary heart disease.

A separate line of research has led to the identification of stressful life events as consistent precursors to clinical coronary heart disease (Byrne & Whyte, 1980; Ruberman, Weinblatt, Goldberg, & Chaudhary, 1984; Theorell & Rahe, 1974). Consideration of the major themes of the Type A behavior pattern led Byrne (1981) to hypothesize that Type A individuals may act, perhaps inadvertently, to place themselves in social and work settings where there is an increased probability of encountering stressful life events.

Exploration of this hypothesis by Rosenman (1983) revealed that Type B individuals reported fewer stressful life events than Type A individuals. Byrne and Rosenman (1986) reported significant correlations for the tendency among individuals with the Type A behavior pattern both to

encounter life events and to incur distress from those encounters. The pattern of correlations was suggestive of a general tendency for those with the Type A behavior pattern to be more prone and more reactive to life event experience than those with lesser degrees of the Type A behavior pattern. The strongest relationships were between life events related to the work setting and the Job Involvement (Factor J) component of the instrument used to measure Type A behavior (Byrne & Rosenman, 1986).

The research of Rosenman (1983) and Byrne and Rosenman (1986) confirms the hypothesis that the Type A behavior pattern promotes the establishment and maintenance of a life style that tends to facilitate an individual's exposure to a range of social and work stressors. Byrne and Rosenman (1986) contend that a salient feature of the Type A behavior pattern is that it involves a set of response patterns related to establishment and organization of life style. Type A individuals would likely organize their life styles considerably differently from those without the Type A characteristics. The nature of the Type A behavior pattern characteristics appears consistent with a life style that would expose an individual to work and social stressors to a greater degree than would be the case for a life style in which Type A behavior pattern characteristics were absent on a consistent basis (Byrne & Rosenman, 1986). Therefore, there is beginning support for a link between

stressful life events and the Type A behavior pattern as precursors of coronary heart disease.

In summary, the early evidence that the Type A behavior pattern was an independent risk factor for coronary heart disease was impressive. Later research began to implicate Type A behavior pattern subcomponents such as hostility as probable salient risk factors. Recent questioning of the construct validity of Type A behavior, although prone to potential methodological problems, indicates that the relationship between personality and heart disease is likely much more complex than the initially described paradigm.

Serum Cholesterol

Cholesterol is a type of animal fat that is manufactured by the body and consumed in the diet. Researchers have determined that between 80% and 90% of total serum cholesterol is formed by the cells of the body, especially the liver cells; the remainder is contributed by diet (DeBakey, Gotto, Scott, & Foreyt, 1984; van Doornen & Orlebeke, 1982). Endogenous serum cholesterol production is closely regulated in the liver, and when more cholesterol is consumed in the diet, less is manufactured by the liver. This intrinsic feedback control system usually regulates total serum cholesterol within $\pm$ 15% of its homeostatic value in spite of diet changes, although extremely high or

low levels of cholesterol in the diet may alter the level by as much as ± 30% (Guyton, 1976).

The relationship between total serum cholesterol and atherosclerosis, a disease of the large arteries in which fat deposits appear in the inner layer or the arteries, has been well established by a number of researchers (Dawber, 1980; DeBakey et al., 1984; Kannel & Dawber, 1982; Szatrowski et al., 1984). The atherosclerotic deposits frequently are associated with degenerative changes in the arterial wall. These changes lead to the formation of hard arteries, a disease referred to as arteriosclerosis. It is the presence of arteriosclerosis that can influence morbidity and mortality from coronary heart disease (DeBakey et al., 1984). Guyton (1976) estimated that nearly half of all human beings die of arteriosclerosis. The issue of optimal level of total serum cholesterol remains controversial. Twelve years ago, 240 mg/dL was considered the upper limit of an acceptable level (Wright, 1976). Acceptable upper levels now have been reduced to the 200 to 220 mg/dL range (DeBakey et al., 1984; Superko, Haskell, & Wood, 1985). Although researchers remain uncertain concerning the upper limit of a "safe" total serum cholesterol, they do agree that the lower the cholesterol level, the less impact cholesterol will have as a risk factor of coronary heart disease.

Cholesterol level has been found to increase during periods of stress due to sympathetic reaction to various threatening stimuli. Friedman, Rosenman, and Carroll (1958) reported that accountants, under stress to meet work deadlines, had average serum cholesterol levels 42 mg/dL higher than when they were not under stress. This effect was seen after levels of physical activity, weight, and diet were controlled for. Extrapolating from the results of an experiment by Connor and Connor (1977), the stress-induced increase of 42 mg/dL would be equivalent to the change that would be seen if dietary intake of cholesterol were increased 70%.

Several researchers have found that students under stress during examination periods have had elevations of serum cholesterol that were significantly different than their baseline levels (Dreyfuss & Czaczkes, 1959; Rahe, Rubin, Arthur, & Clark, 1968; Thomas & Murphy, 1958). More recently, these findings have been replicated by van Doornen and Orlebeke (1982).

Serum cholesterol level has been reported to be positively correlated to measures of dominance, achievement motivation, aggression, and hostility (Sloane, Habib, Eveson, & Payne, 1961). Jenkins, Humes, and Zyzanski (1969) found significant positive relationships between cholesterol level and competitiveness, aggression, and impatience for a college student sample. A significant

correlation between cholesterol level and achievement motivation was reported by van Doornen and Orlebeke (1982). This relationship was gender dependent with males demonstrating a reasonably strong correlation between achievement motivation and cholesterol response to stress (r = .53), whereas the relationship for females was virtually absent (r = .02).

In summary, there is evidence that certain psychological attributes such as stress, mood, and personality exert an effect on serum cholesterol level. When diet and exercise are controlled, the effect remains. The multiple factors than can influence serum cholesterol level make it an important albeit difficult risk factor to control.

Serum Triglyceride

Triglyceride is a type of fat manufactured by the body and also found in animal and vegetable dietary sources. In human metabolism, triglycerides may be either deposited in fat cells or broken down to produce energy. Excess calories are converted by the liver into triglycerides. The triglycerides manufactured in the liver are transported through the blood by smaller particles known as very low density lipoproteins. These very low density lipoproteins may be broken down in the body into smaller particles called low density lipoproteins. It is during this breakdown that the very low density lipoproteins release

the triglycerides they contain. The low density lipoproteins, containing mainly cholesterol, have been associated with an increased risk of coronary heart disease (DeBakey et al., 1984).

The relationship between coronary heart disease and very low density lipoprotein (those containing triglycerides) has not been as well defined by researchers as has the cholesterol link to heart disease. DeBakey et al. (1984) reported that higher triglyceride levels were found in persons with coronary heart disease, but the association was nonsignificant, whereas Carlson and Bottiger (1981) found that triglyceride level was predictive of coronary heart disease. Rosenman et al. (1975) found no systematic relationship between triglyceride level and coronary heart disease in their analysis of data from the Western Collaborative Group Study.

These findings clearly are inconsistent. This lack of agreement over the potential relevance of triglyceride as a coronary heart disease risk factor indicates the need for additional research that investigates the relationship between triglyceride level and psychological correlates of coronary heart disease.

Locus of Control

Locus of control is a construct derived from Rotter's (1954) social learning theory. This construct describes the way an individual interprets the connection between

personal behavior and reinforcement. An individual with a more internal locus of control tends to view life experiences as consequences of one's own actions and therefore potentially controllable (Lefcourt, 1976). Conversely, an individual with a more external locus would tend to consider life experiences as primarily determined by factors such as fate, chance, and powerful others (Schallow, 1975).

Wallston and Wallston (1978) in a comprehensive review of the research literature related to locus of control and health, concluded that generally internality was associated with success for a series of health-related behaviors such as birth control and smoking cessation. Rosenbaum and Raz (1977) reported that internals were more effective in their response to a health threat. Although those with an internal locus displayed denial when confronted with a threat, the denial did not prevent them from trying to improve their situation. Individuals with an external locus, although displaying less denial, felt less responsible for outcomes, especially unfavorable ones, and showed a preference for situations that enabled them to rationalize failure (Phares & Lamiell, 1974; Rosenbaum & Raz, 1977). Sandler and Lakey (1982) found that individuals who were faced with negative life events reported a stress-buffering effect of social support only if they had an internal locus of control.

Thomas and Hooper (1983), following a review of research concerning the relationship between health and locus of control, concluded that an internal locus of control potentially could influence health in three positive ways. The first way could be through mediation of aversive stimuli by enhancement of coping behaviors. The second way relates to a predisposition for increased social activity that might lead to establishment and maintenance of appropriate lines of social support. The final positive influence on health could operate through creation of an increased sense of responsibility for personal health.

Using the locus of control construct to help understand and explain health-related behaviors generally has been a viable line of research, but there are some cautions that need to be addressed. Arakelian (1980) advised that the complexity of many health behaviors precluded the use of locus of control as a sole predictor. Locus of control is more likely to function as a mediating variable rather than a principal determinant. Perhaps the most important caution relates to the nature of research linking locus of control to health; these studies are inherently correlational and therefore indicate associations, not causality.

Leisure Activity

The first step in measurement of a variable is establishment of an operational definition for that

variable. Therein lies a major problem with the measurement of leisure activity. Researchers and theorists involved in the study of leisure have been unable to reach agreement on a comprehensive definition of leisure (Neulinger, 1981; Roadburg, 1983; Sessoms, 1986). Attempts at quantification and understanding of leisure are necessarily compromised when definitions used by researchers lack uniformity. The majority of leisure researchers have used objective checklists to measure leisure activity (Allen, 1982; Buchanan, 1983; Neulinger, 1981; Raghad & Beard, 1982). These checklists range from 37 to over 100 items in an attempt to measure leisure with reasonable accuracy. A logical consequence of including a large number of items on a checklist has been a reduction in response rate (Neulinger, 1981).

Although there are problems associated with the measurement of leisure activity, there are also some potentially useful findings that have been reported concerning the link between leisure activity and health. A number of researchers have investigated the link between leisure activity and life satisfaction. Kelly, Steinkamp, and Kelly (1987) reported that leisure activity was the most important non-economic factor related to an individual's subjective well-being. Buchanan (1983) and Neulinger (1981) found support for the positive association between leisure activity and life satisfaction. A key feature

of leisure activity is the link between such activity and mental health (Neulinger, 1981). Using a contrasted groups method, Berg and Neulinger (1976) found that individuals judged to be in a high mental health group were more involved in leisure activities and more positive about their involvement than the comparison group.

The link between physical health and leisure activity has been determined for leisure activities that involve physical activity. Superko et al. (1985) reported that level of physical activity was significantly inversely related to serum cholesterol. Other links between leisure activity and health are not as direct. Higher levels of leisure activity generally are associated with greater life satisfaction, but the connection between life satisfaction and physical well-being is not as straightforward. The healthy mind-healthy body relationship is intuitively appealing but at times difficult to support empirically (Dubos, 1980).

In summary, leisure activity is hard to measure because it has been difficult to reach agreement on what activities are leisure activities. Leisure researchers have begun to establish a relationship between leisure activity and life satisfaction.

CHAPTER III

METHODOLOGY

This study of the relationships between behaviors broadly characterized as effective life style activities and health indicator variables was conducted to assess the criterion validity of the Tennessee Self-Description Form as an index of a healthy life style. In the first section of this chapter, the hypotheses and related questions are presented. The remaining sections contain discussions of the design, sample, instruments, data collection procedures, operational definitions, and data analyses used in the study.

Hypotheses

The hypotheses addressed in this study were:

1. The Jenkins Activity Survey (JAS) scores of each scale (Type A, Speed and Impatience, Job Involvement, and Hard-Driving and Competitiveness) will be significantly negatively related to each area of life style effectiveness of the Tennessee Self-Description Form (TSDF).

2. Rotter's Internal-External Locus of Control (RI-ELC) will be significantly negatively related to each TSDF area of life style effectivesess.

3. The high TSDF score groups for each area of life style effectiveness will have significantly lower fasting serum cholesterol levels than the corresponding low TSDF score groups.

4. The high TSDF score groups for each area of life style effectiveness will have significantly lower fasting serum triglyderide levels than the corresponding low TSDF score groups.

5. The TSDF leisure score will be significantly positively related to the amount of time spent in leisure activity.

In addition to testing these research hypotheses, two questions, related to areas in which lack of background information precluded formulation of hypotheses, were explored. One question addressed the degree of correspondence between initial placement of the TSDF items into the four areas of life style effectiveness and the placement of items on the basis of a factor analysis solution. The second question addressed whether the TSDF scores formed from a factor analysis solution were more strongly associated with the health indicator variables than were the TSDF scores formed on the basis of the original placement of items.

Coefficients of stability and internal consistency were determined for each of the TSDF scores. Measures of central tendency and frequency distributions were calculated to provide a description of the total sample and relevant subgroups.

Design

This was a descriptive correlational study. The criterion variables were global Type A, speed and impatience, job involvement, hard-driving and competitiveness, locus of control, serum cholesterol, serum triglyceride, and leisure activity.

Sample

The participants in the study comprised three groups recruited through the use of a nonprobability sampling plan. The first group consisted of 198 University of Tennessee, Knoxville faculty and staff; the second group was composed of 108 senior and graduate students enrolled in the University of Tennessee, Knoxville College of Nursing; the final group comprised 156 registered nurses employed full time in Knoxville and surrounding counties. The total sample size was 462 individuals. A sample of this size exceeded the 10:1 subjects to variables ratio recommended as a minimum for factor analysis solutions. The importance of this ratio is that there will be little sampling error, increasing the likelihood of a clearer identification of interpretable factors (Gorsuch, 1974; Nunnally, 1978).

Sample Selection

In the first group, 279 University of Tennessee, Knoxville faculty and staff were chosen from among those

who had participated in a 1983 Operation Health Check organized in conjunction with the National Health Screening Council for Volunteer Organizations. The 279 Operation Health Check participants represented all who had fasting serum chemistries drawn and analyzed as a part of their health screening. Seventy-one percent of this group (n = 198) elected to participate in the study.

For the second group, all students who were in the two University of Tennessee, Knoxville College of Nursing research methods classes taught by the researcher during the 1983-84 academic year were invited to participate in the study. One hundred percent (n = 108) agreed to participate.

The third group was obtained by having graduate students in a research methods course taught by the researcher during Spring Quarter 1984 recruit a maximum of 10 subjects each. A total of 156 nurses chose to participate. This number represented 95% of those initially contacted by the students.

Sample characteristics

Sociodemographic characteristics of the combined sample are presented in Table 1. The three groups were combined since one-way analyses of variance indicated no significant differences among the groups with respect to all except one of the criterion variables referred to in the subsidiary questions. The one difference was a

Table 1. Percentage Distribution of Sociodemographic Variables

Variable	n	%
Gender		
Male	91	19.7
Female	371	80.3
Race		
White	435	94.2
Black	20	4.3
Oriental	7	1.5
Marital Status		
Single	145	31.4
Married	278	60.2
Divorced/separated	32	6.9
Widowed	7	1.5
Age		
21-30	180	39.0
31-40	139	30.1
41-50	88	19.0
51-60	43	9.3
61-65	12	2.6

Table 1 (Continued)

Variable	n	%
Educational Level		
Less than high school	11	2.4
High school	35	7.6
Some college	140	30.3
Associate degree	67	14.5
Bachelor's degree	107	23.1
Master's degree	42	9.1
Doctorate	60	13.0
Occupation		
Administration	42	9.1
Faculty, University	66	14.3
Clerical	54	11.7
Maintenance	18	3.9
Technical Support	18	3.9
Nursing Student	108	23.3
Registered Nurse	156	33.8

significantly higher JAS Job Involvement score for the nursing student group in comparison to the UTK faculty and staff and the registered nurse groups. This difference may be related to the combined academic and clinical practice responsibilities that are an integral part of the nursing student role.

There were 371 females and 91 males in the sample. Over 90% of the respondents were Caucasian. The majority of the sample (60.2%) was married. The mean age was 36 years. Ninety percent of the subjects had education beyond the high school level. Among respondents with a post-high school education, 45.2% had a baccalaureate or higher degree and 30.3% had completed some college work. The remaining 14.5% held an associate degree. Whereas a variety of occupations was represented, over 80% of the respondents were engaged in professional level job activities.

Measurement

Data collection for the current study was accomplished by administration of questionnaires and record review. Instrumentation and procedures for the sample of university personnel and the nursing student and registered nurse samples differed in some respects.

Instrumentation

The Jenkins Activity Survey (JAS) Form C, The Tennessee Self-Description Form (TSDF), and a sociodemographic questionnaire were used to collect data from university personnel. In addition to these data, fasting serum cholesterol and triglyceride levels were obtained through review of records provided by the sponsor of a university health screening for faculty and staff. Data were collected from nursing students and registered nurses using the JAS, TSDF, Rotters' Internal-External Locus of Control (RI-ELCS) questionnaire, and a sociodemographic questionnaire.

Nursing students completed Form N of the JAS, which was designed for use with unemployed persons, and Form C, designed for use with employed persons. The clinical practice components of courses in nursing school are designed to be very similar to the occupational experience. Nursing students, although not professionally employed, were involved in over 20 hours of clinical practice per week. Correlations between scale scores of Form C and Form N revealed coefficients between .94 and .96 (Jozwiak, 1985). These strong associations led to the decision to use Form C scale scores for all subjects.

Jenkins Activity Survey (Form C)

Form C of the JAS is the most recent edition (Jenkins, Zyzanski, & Rosenman, 1979) of an instrument designed to measure Type A behavior, a pattern of behavior that has

been linked to coronary heart disease (Rosenman et al., 1964; Waldron, Zyzanski, Shekelle, Jenkins, & Tannenbaum, 1977). This questionnaire is a paper and pencil self-report instrument comprising 52 multiple choice items based on a conceptualization of the Type A coronary-prone behavior pattern described by Friedman and Rosenman in 1959. The JAS provides standard scores for the multifactorial clinical construct of the coronary-prone behavior pattern (Type A), and three factorially independent components of the Type A construct. These components are Speed and Impatience (Factor S), Job Involvement (Factor J), and Hard-Driving and Competitiveness (Factor H). Factor S measures the time urgency revealed in the style of behavior that characterizes the Type A individual. Factor J is designed to quantify the degree of dedication to occupational activity. It is related to the type of occupational setting that is likely to lead to development of Type A behavior. Factor H measures perceptions of oneself as being hard-driving, conscientious, responsible, serious, competitive, and likely to put forth more effort than other people. This factor is related to the character traits and values associated with Type A behavior (Shekelle, Schoenberger, & Stamler, 1976; Zyzanski & Jenkins, 1970).

The four JAS scores have been shown to have uniform coefficients of internal consistency, ranging from .73 to .85. Several studies have found coefficients of stability

that ranged from .65 to .82 (Caffrey, 1968; Jenkins et al., 1979). Validation evidence has been obtained from prevalence studies of coronary heart disease, as indicated by significant differences in the Type A scores of individuals with and without a history of coronary heart disease Predictive studies further have established that individuals with higher JAS scores are more likely to sustain heart attacks. Other studies have linked Type A behavior as measured by the JAS to the likelihood of recurrent myocardial infarctions and to the severity of coronary atherosclerosis (Caffrey, 1968; Jenkins et al., 1979). Several studies have shown that Type A men have over twice the occurrence of coronary heart disease when compared to men who have the opposite (Type B) behavior pattern (Jenkins et al., 1979; Jenkins, Zyzanski, Rosenman, & Cleveland, 1971). Preliminary studies with women are beginning to show similar patterns (Waldron, 1978; Waldron et al., 1977). A copy of the JAS is not included in the Appendix because the Psychological Corporation, owner of the copyright, refused permission to reproduce the JAS.

Tennessee Self-Description Form

The TSDF is a revised version of the Self-Description Form (SDF) developed by Thomas, Williams, and Olsen (1982). The current version is a 47-item paper and pencil self-report instrument designed to measure life style effectiveness in work, social, health, and leisure areas of

life. Each area is represented by 10 items; the remainder of the instrument contains one filler item and six social desirability items. Work, social, and health areas contain an equal number of positive and negative items (positive items represent activities that are expected to contribute to effective and healthful living, whereas negative items represent activities that are expected to prevent or hinder effective and healthful living). The leisure area contains only positive items. The total score is a summation of scores from the four areas of life style effectiveness.

Young (1985) reported Cronbach's alpha coefficients for the original 56-item SDF as .51 for work, .41 for social, .48 for health, .62 for leisure, and .67 for the items comprising the total score. Cronbach's alpha coefficients for the revised 47-item TSDF used in the current study are .52 for work, .69 for social, .32 for health, .63 for leisure, and .74 for the 40 items that comprise the four areas of life style effectiveness. Coefficients of stability for the original SDF were reported by Young as .67 for work, .55 for social, .85 for health, .76 for leisure, and .72 for the 40 items used to determine the total score. Using the revised TSDF, test-retest reliabilities over a 10 week interval were calculated for the nursing student sample (n = 108). Coefficients of stability were determined to be .73 for

work, .52 for social, .94 for health, .71 for leisure, and .74 for the total of the four areas.

Validation work reported by Young (1985) in relation to the original SDF did not focus on the relationship of the instrument to indicators of health. Thomas (1983), using the SDF, determined that health and total scores were positively correlated with health habits and internal health locus of control. Additionally, the mean health score of hospitalized subjects was the lowest of all subgroups in Thomas' study. A copy of the TSDF is included in Appendix A.

Rotter's Internal-External Locus of Control Scale

Rotter's Internal-External Locus of Control Scale (RI-ELCS) was developed by Rotter (1966) to measure generalized expectancies that reflect the extent to which individuals believe they have or do not have the power to control events in their lives. The RI-ELCS also was designed to reflect the degree to which individuals accept personal responsibility for what happens to them. The instrument, based on Rotter's social learning theory, consists of 23 question pairs in a forced-choice format plus six filler questions.

Although the RI-ELCS yields a measure of generalized expectancy for reinforcement rather than a specific health-related expectancy, Rotter's instrument was used instead of a specific health locus of control measure to reduce the

probability of a response bias for the sample of registered nurses and nursing students. It was felt that the contents of the Multidimensional Health Locus of Control Questionnaire (Wallston & Wallston, 1978) likely would influence registered nurses and nursing students to respond in a manner that supported professional philosophy (internality is desirable) regardless of their personal beliefs.

A Kuder-Richardson coefficient of .70 has been reported for the RI-ELCS. Coefficients of stability have ranged from .72 to .83 (Rotter, 1966). Validation studies, using measures of improved health status as criterion measures, have shown an internal orientation to be associated with improved health (Naditch, 1974; Wennerholm & Zarle, 1976). A copy of this instrument is included in Appendix B.

Demographic Questionnaire

Three forms of a demographic questionnaire were developed by the researcher. The first, used with the university personnel sample, is a 14-item questionnaire. A copy of this instrument is included in Appendix C. The second form, used with the nursing student sample, is an 18-item instrument. A copy of this questionnaire is included in Appendix D. The third form, developed for use with the registered nurse sample, is a 24-item questionnaire. A copy of this instrument is included in Appendix E.

Cholesterol and Triclyceride

Twelve hour fasting serum cholesterol and triglyceride levels were determined by the clinical laboratory of Fort Sanders Regional Medical Center in Knoxville, Tennessee. The standard error of measurement for these analyses was reported as 5%.

Procedures

Permission to gain access to the list of participants and data obtained during the 1983 on-campus Operation Health Check was received from Ms. Christie Dowling, Project Director for Operation Health Check in the East Tennessee region (see Appendix F). All (n = 279) University of Tennessee, Knoxville faculty and staff who had fasting serum chemistries drawn and analyzed as part of the health screening were contacted through campus mail in January, 1984, and requested to complete the JAS, TSDF, and a sociodemographic questionnaire. A cover letter attached to the questionnaire contained an explanation of the study and assurance of confidentiality of response. As an incentive for participation, the option for individual feedback was provided by the researcher. A copy of the university personnel cover letter is included in Appendix G.

Participants were instructed to return completed questionnnaires within 10 days through the campus mail. The first response wave provided 124 usable sets of questionnaires. A follow-up letter was sent to all

nonrespondents two weeks after the first mailing. The return of 58 sets of usable questionnaires followed during the next two week interval. A second and final follow-up letter was sent to all remaining nonrespondents two weeks after the first follow-up mailing. This provided an additional 16 sets of usable questionnaires. The first mailing and two follow-up mailings resulted in collection of 198 sets of usable questionnaires from the 279 university personnel initially contacted, which represents a return rate of 71%.

All students who were in the two University of Tennessee, Knoxville College of Nursing research methods courses taught by the researcher during the 1983-84 academic year received a cover letter that explained the current study. As an incentive, participants were provided individual feedback and a small number of points that would be applied toward course grades. One hundred percent (n = 108) agreed to participate. Questionnaire packets were distributed during class and completed on an individual basis outside of class. All returned questionnaire packets were usable. A copy of the nursing student cover letter is included in Appendix H.

The registered nurse sample was recruited by graduate students enrolled in a course titled Applied Nursing Research, which was taught by the researcher during Spring Quarter 1984. Students were given the opportunity to serve as research assistants in exchange for a small number of

points that would be applied toward their course grades. Each student who elected to participate was instructed to recruit a maximum of 10 registered nurses who currently were employed full-time in nursing. Student assistants distributed the questionnaire packets to subjects on an individual basis. Each packet contained a cover letter that explained the current study and promised individual feedback to all who were interested. A copy of the registered nurse cover letter is included in Appendix I.

Questionnaires were completed outside of the work setting, sealed in the envelope provided, and returned to the student assistants who returned the envelopes to the researcher. Nineteen students recruited a total of 156 registered nurses. This number of nurses represented 95% of those initially contacted by the students. All returned questionnaire packets were usable.

The Social Desirability score of the TSDF was used to screen subjects for their tendency to provide socially desirable responses. A minimum score of 18 had been designated by Thomas et al. (1982) as an indicator of the social desirability tendency. Application of this criterion to the 462 subjects in the current study did not exclude anyone.

Operational Definitions

Type A behavior pattern was operationalized as the subject's standard score on the 21-item Type A subscale of the JAS (Form C), (Jenkins et al., 1979).

Factor S was operationalized as the subject's standard score on the 21-item Speed and Impatience subscale of the JAS (Form C), (Jenkins et al., 1979).

Factor J was operationalized as the subject's standard score on the 24-item Job Involvement subscale of the JAS (Form C), (Jenkins et al., 1979).

Factor H was operationalized as the subject's standard score on the 20-item Hard-Driving and Competitiveness subscale of the JAS (Form C), (Jenkins et al., 1979).

Internal-external locus of control was operationalized as the subject's total number of externally oriented responses on Rotter's Internal-External Locus of Control Scale (1966).

Work score was operationalized as the sum of the subject's responses to the five positive TSDF work items minus the sum of the subject's responses to the five negative TSDF work items (Thomas et al., 1982).

Social score was operationalized as the sum of the subject's responses to the five positive TSDF social items minus the sum of the subject's responses to the five negative TSDF social items (Thomas et al., 1982).

Health score was operationalized as the sum of the subject's responses to the five positive TSDF health items minus the sum of the subject's responses to the five negative TSDF health items (Thomas et al., 1982).

Leisure score was operationalized as the sum of the subject's responses to the 10 TSDF leisure items (Thomas et al., 1982).

Total score was operationalized as the sum of the subject's work, social, health, and leisure scores (Thomas et al., 1982).

Cholesterol was operationalized as the subject's 12 hour fasting level for total serum cholesterol measured in milligrams per decaliter (Podell, 1983).

Triglyceride was operationalized as the subject's 12 hour fasting level for serum triglyceride measured in milligrams per decaliter (Podell, 1983).

Leisure time was operationalized as the subject's report of the number of hours spent in leisure activity during a typical week.

Plan of Analysis

All data analysis procedures were computed using the Statistical Analysis System (SAS) (SAS Institute Inc., 1985). Univariate descriptive statistics were calculated for all health indicator variables and sociodemographic variables for the university personnel, nursing students, and registered nurse samples. One-way analyses of variance were computed for JAS, TSDF, and locus of control scores to determine whether any significant differences existed among the three groups. The only difference found was a significantly higher

JAS Job Involvement score for the nursing student subgroup when compared to the other two groups. This difference is likely related to the combined academic and clinical practice responsibilities that are an inherent part of the nursing student role. On the basis of these calculations, groups were combined for other statistical procedures.

The first two hypotheses were tested by use of the Pearson Product Moment Correlation procedure. Hypotheses three and four were tested by use of an independent samples t test. A two group analysis was chosen for these hypotheses because the dependent variables, serum cholesterol and triglyceride, were measured in units (mg/dL) that have direct clinical meaning. A two group analysis, unlike a correlational analysis, provided mean difference scores in clinically interpretable units of measurement. High and low TSDF score groups were composed of those subjects whose scores placed them beyond ± 1 standard deviation unit of normative data derived from a prior study by Jozwiak and Williams (1985). Formation of these TSDF comparison groups provided protection against measurement error which could result in misclassification of subjects when comparison groups are formed on the basis of mean or median splits. The fifth hypothesis was tested by use of the Pearson correlation coefficient procedure which explored the extent of the relationship between the TSDF leisure score and the hours spent in leisure activity during a typical week.

Data relevant to this hypothesis were available for the nursing student and registered nurse groups.

In addition to the five hypotheses tested, two questions related to areas in which lack of sufficient information precluded generation of hypotheses were explored. The first question addressed the issue of correspondence between the initial logical placement of the 40 TSDF items into the four areas of life style effectiveness and the factor analytic placement of the items. The 40 TSDF items were factor analyzed using principal component analysis as the initial factoring method. The initial factor matrix was rotated by use of the Varimax technique to simplify the factor structure by maximizing the variance of a column of the pattern matrix (Kim & Mueller, 1978a). A decision on the number of factors to retain was based on Kaiser's criterion of eigenvalues greater than one (Kaiser, 1974), the results of the Scree test (Cattell, 1965), and the criterion of substantive importance (Kim & Mueller, 1978b).

The second question focused on an exploration of the strength of associations between TSDF scores based on factor analytic placement of items and the health indicator variables. Associations were determined by use of the Pearson correlation procedure. The TSDF scores in this anaylsis were recalculated on the basis of the final set of retained factors provided by the Varimax rotation. The

scoring procedure used for recalculation of TSDF scores was identical to the procedure used throughout the current study and is based on the scoring methods developed by Thomas et al. (1982).

CHAPTER IV

RESULTS AND DISCUSSION

The data from this study are presented in five sections. The first section contains descriptive statistics for the entire sample with respect to dependent measures used in this study. The second section presents data pertaining to the five hypotheses. The third section contains the results of a factor analysis solution for the TSDF. The fourth section displays the association between the factor analysis derived TSDF scores and the health indicator variables used as dependent measures. The final section presents a summary of the major findings of the study.

Descriptive Statistics

Table 2 presents means, standard deviations, and minimum and maximum values for all dependent variables of the study. Serum cholesterol, serum triglyceride, locus of control, and hours spent in leisure activity per week were not assessed on all respondents, leading to variation in the number of reported respondents. Nine respondents' TSDF scores were deleted from further analysis due to the presence of missing values. The JAS scale scores are presented as percentile scores. All dependent measures were approximately normally distributed with the exception

Table 2. Sample Size, Means, Standard Deviations and Minimum and Maximum Values for Dependent Variables

Variable	n	Mean	SD	Min.	Max.
TSDF Work	453	6.08	3.51	-6.0	15
TSDF Social	453	7.44	3.47	-9.0	20
TSDF Health	453	5.17	4.12	-8.0	15
TSDF Leisure	453	6.54	2.08	0.5	14
TSDF Total	453	25.23	8.00	1.0	50
JAS Type A	462	52.68	26.85	3.0	99
JAS Speed & Impatience	462	50.11	27.17	1.0	99
JAS Job Involvement	462	56.78	27.22	1.0	99
JAS Hard-Driving and Competitiveness	462	47.09	26.52	1.0	97
Locus of Control	264	9.30	4.08	1.0	21
Serum Cholesterol	198	202.87	35.85	119.0	304
Serum Triglyceride	198	97.36	38.54	18.0	417
Hours of Leisure Activity per Week	258	9.60	7.83	0.0	40

of the JAS Job Involvement score. As previously discussed, Job Involvement was skewed because the nursing student subgroup (n = 108) had a mean percentile Job Involvement score of 75, whereas the remainder of the sample (n = 354) had a mean Job Involvement score at the 50th percentile.

All of the instruments used in this study had been used by other researchers, which allowed the measurements obtained from the sample to be compared to normative data. Normative data for the initial form of the TSDF were obtained on a predominantly college student sample. Mean scores were 3.77 for work, 6.39 for social, 4.04 for health, 8.18 for leisure, and 22.39 for total (Young, 1985). Mean values for the predominantly older, out of college sample in the present study were higher than those reported by Young except for leisure (6.08 for work, 7.44 for social, 5.17 for health, 6.54 for leisure, and 25.23 for total).

Mean percentile scores for the JAS Type A and Speed and Impatience scale scores were close to the 50th percentile (52.68 and 50.11 respectively) reported by Jenkins, Zyzanski and Rosenman (1979) as population norms. The JAS Job Involvement mean percentile score of 56.78 for this sample varied from the 50th percentile norm due to the previously mentioned atypical scale elevation of the nursing students. The JAS Hard-Driving and Competitiveness mean percentile score of 47.09 was lower than the accepted

population norm of 50. Whereas the sample in this study was largely female (80.3%), gender did not account for the lower Hard-Driving and Competitiveness score. The males in this sample had a mean Hard-Driving and Competitiveness score that was five percentile points lower than the females'. It is possible that the work environments of the subjects did not provide settings in which hard-driving and competitive characteristics would be either stimulated or rewarded.

The mean score for Rotter's locus of control (9.6) was comparable to norms reported by Rotter (1966) for over 4,000 subjects. Mean normative score for males was reported as 8.2; for females as 8.5; and for the combined sample as 8.3.

Sample mean values for fasting serum cholesterol (203) and triglyceride (97) were below the 215mg/dL and 150mg/dL reported as average levels of cholesterol and triglyceride respectively (DeBakey et al., 1984; Fulwood et al., 1987). Whereas these researchers state that current knowledge does not allow anyone to state that a specific value of cholesterol or triglyceride is "normal" or "safe", the values they present indicate that the sample in this study was lower than average with respect to serum lipid values.

Reports of the average number of hours people spend in leisure activity per week have varied considerably among researchers working in this area. Neulinger (1981), in an

analysis of several studies, presents means ranging from 5 to 12 hours per week as indicative of satisfactory leisure time, whereas Szalai (1972), by including activities that he labels semi-leisure, cites values of 14 to 19 hours per week as representative of satisfactory leisure. The value of 9.6 hours per week for the sample in this study, although within the lower limit reported by Neulinger, may be somewhat lower than average if an expanded definition, similar to the one used by Szalai, is employed.

Tests of Hypotheses

The first two hypotheses were tested with the Pearson Product Moment Correlation procedure. These results are presented in Tables 3 and 4 respectively. Hypotheses three and four were tested with independent samples t tests. The outcome of these analyses is presented in Tables 5 and 6 respectively. The fifth hypothesis was tested with the Pearson Product Moment Correlation procedure.

Hypothesis One

The first hypothesis predicted that each of the JAS scale scores (Type A, Speed and Impatience, Job Involvement, and Hard-Driving and Competitiveness) would be negatively related to scores on each of the TSDF areas of life style effectiveness (work, social, health, leisure, and total). The Pearson Product Correlation procedure was used

Table 3. Correlation Matrix of JAS Scale Scores with TSDF Areas of Life Style Effectiveness

Variables	Type A	Factor S	Factor J	Factor H
Work	-.01 .8361	-.10 .0425	-.01 .8361	.16 .0008
Social	-.11 .0176	-.29 .0001	.02 .7161	.04 .3500
Health	-.08 .1090	-.31 .0001	.09 .0537	-.01 .8361
Leisure	.04 .3500	-.02 .5973	.16 .0008	-.03 .4732
Total	-.08 .1090	-.33 .0001	.09 .0537	.07 .1478

Note. n = 453. The first number in each entry is r and the second is p.

Table 4. Correlations of TSDF Areas of Life Style Effectiveness with Locus of Control

Variables	Work	Social	Health	Leisure	Total
Locus of Control	-.13	-.20	-.21	-.12	-.29
	.0373	.0013	.0007	.0473	.0001

Note. n = 257. The first number in each entry is r and the second is p.

to assess the strength and direction of these relationships. Negative associations were obtained for all except one of the 10 correlations between TSDF areas of life style effectiveness and JAS Type A and Speed and Impatience (Factor S) scale scores. The exception was the correlation between the TSDF leisure score and the Type A score (r = .04). The strongest inverse relationships, significant at $p<.0001$, were between the JAS Factor S scale score, the TSDF social (r = -.29), health (r = -.31), and total (r = -.33) scores.

Other significant negative relationships were found between Type A and TSDF social (r = -.11, p = .0176) and Factor S and TSDF work (r = -.10, p = .0425) scores. The only correlation between Factor S and the TSDF scores that was not statistically significant was the relationship to the leisure score (r = -.02, p = .5973). With the exception of the negative relationship between Type A and the TSDF social score, correlations between Type A and the TSDF scores were not statistically significant.

A note of caution must be stressed in relation to correlations that were found to be statistically significant. Because of the large sample size used in this study, it was possible to obtain statistical significance for associations whose calculated coefficients were low. A useful measure of the meaningfulness of correlation coefficients is the coefficient of determination, which is a measure of the

percent of variance that pairs of variables share. For example, the largest statistically significant correlation in Table 3, r = -.33 for TSDF total and Factor S scores, would represent a coefficient of determination of 10.89%, whereas the smallest statistically significant correlation, r = -.10 for TSDF work and Factor S scores, would have a coefficient of determination of only 1%.

These findings provide support for the contention that life style effectiveness is related to an individual's systematic and consistent self-involvement in the management of daily situations (Watson & Tharp, 1985; Williams & Long, 1983) The approach to daily living that is embodied in the TSDF may be characterized as planned action in contrast to the hurried reaction that is characteristic of a high Factor S scale score.

Byrne and Rosenman (1986) have described the Type A behavior pattern as one that is consistent with a life style that would expose an individual to work and social stressors to a greater degree than would be the case for a life style in which the Type A behavior pattern characteristics were absent on a consistent basis. The associations between Factor S and the TSDF measures support this description of the Type A life style. The link between Factor S and the anger and hostility components of the Type A behavior pattern identified by Lambert et al. (1987) adds relevance to the negative

associations described between Factor S and the areas of life style effectiveness measured by the TSDF.

Other relationships were not as conceptually or as empirically distinct. The measure of global Type A behavior was negatively correlated with all TSDF areas of life style effectiveness except leisure but the correlations were weak. This may be due to the inability of the global Type A measure to satisfactorily quantify subcomponents of the behavior pattern that may be stronger risk factors for coronary heart disease (Byrne & Rosenman, 1986; Dimsdale, 1988).

Correlations between TSDF areas and JAS Job Involvement (Factor J) and Hard-Driving and Competitiveness (Factor H) illustrated a nearly opposite picture with only 3 of the 10 correlations being negative. All three of these correlations were weak inverse relationships, with the strongest being $r = -.03$ between the TSDF leisure score and the JAS Factor H score. Five of the seven positive correlations yielded coefficients that were less than .10 in each case. The two statistically significant correlations were between Factor J and the TSDF leisure score ($r = .16$, $p = .0008$) and Factor H and the TSDF work score ($r = .16$, $p = .0008$). Therefore, hypothesis one was partially supported.

One possible explanation for the pattern seen with Factors J and H is that there are aspects of job involvement and hard-driving and competitiveness that could

be viewed by some individuals as healthy aspects because they serve to establish a sense of purpose and motivation to become active in other areas of one's life. Another possible explanation is that individuals who tend to score higher on the Factor J and Factor H scales often are rewarded for these behaviors by the system in which they work. Such reinforcement may enhance self-efficacy and lead to an increase in adaptive behavior patterns for individuals who are able to deliberately act on rather than hurriedly react to environmental stimuli.

Hypothesis Two

The second hypothesis predicted that there would be significant negative relationships between locus of control and each TSDF area of life style effectiveness. Correlations between locus of control and the TSDF areas of life style effectiveness yielded negative relationships for each of the five correlations. The strongest correlation ($r = -.29$, $p<.0001$) was between the TSDF total score and locus of control. The remaining correlations between the TSDF work, social, health, and leisure scores and locus of control are presented in Table 4. These inverse relationships indicated that respondents with an internal locus of control (low score on Rotter's Internal-External Locus of Control Questionnaire) tended to score higher in

the five areas of life style effectiveness measured by the TSDF. Therefore, hypothesis two was supported.

Hypothesis Three

The third hypothesis predicted that the high TSDF score groups for each area of life style effectiveness would have significantly lower fasting serum cholesterol levels than the corresponding low TSDF score groups. High scorers on each of the TSDF areas of life style effectiveness (individuals whose scores were greater than one standard deviation above the mean) and low scorers on each of the TSDF areas of life style effectiveness (individuals whose scores were lower than one standard deviation below the mean) were selected for comparison with respect to their fasting serum cholesterol levels.

Comparison of mean fasting serum cholesterol values for the high and low TSDF work, social, health, and total score groups yielded lower cholesterol levels for each of the high TSDF groups, but all differences were found to be statistically nonsignificant. Therefore, hypothesis three was not supported.

The largest difference (12.2 mg/dL) was found between the low and high TSDF health score groups. This difference may have clinical significance because it has been reported that on the average, each 1% (about 2 mg/dL) reduction in serum cholesterol results in an approximate

2% reduction in coronary heart disease risk (Rifkind & Lenfant, 1986).

A possible explanation for the lack of statistical significance is that the group was relatively homogeneous with respect to cholesterol level. Participants in this study were volunteers who were likely to be health conscious. Mean serum cholesterol for the group (n = 198) was approximately 203 mg/dL whereas mean serum cholesterol for the adult population in this country is estimated to be 215 mg/dL (Fulwood et al., 1987). Summary statistics for all group comparisons are presented in Table 5.

Hypothesis Four

The fourth hypothesis predicted that the high TSDF score groups for each area of life style effectiveness would have significantly lower fasting serum triglyceride levels than the corresponding low TSDF score groups. High and low TSDF score groups were determined in the manner previously described for analyses of data pertaining to hypothesis three.

Comparison of mean fasting serum triglyceride levels for the high and low TSDF work, social, health, and total score groups yielded lower triglyceride values for each of the high TSDF score groups, but only the difference between the high (77.0 mg/dL) and the low (114.8 mg/dL) health score groups was statistically significant ($t = -2.40$, $p<.0232$). As was the case with serum cholesterol, the mean

Table 5. Sample size, Means, Standard Deviations, and Results of *t* Tests for Hypotheses Concerning Fasting Serum Cholesterol

Group	*n*	Mean	*SD*	*t*	*df*	*p*
High Work Score (>9.5)	45	198.2	37.5	-1.03	69	.3074
Low Work Score (<2.5)	26	207.5	36.5			
High Social Score (>11.0)	57	201.6	29.6	-0.10	45.8	.7356
Low Social Score (<4.0)	28	202.5	40.7			
High Health Score (>9.0)	55	199.4	32.9	-1.55	78	.1263
Low Health Score (<1.0)	25	211.6	32.5			
High Total Score (>33.0)	38	199.3	34.1	-1.34	64	.1743
Low Total Score (<17.2)	28	207.5	39.6			

Note. Analysis for the leisure score was omitted because only four respondents' scores fell into the high leisure score group. Fractional degrees of freedom resulted from unequal sample variances.

value for serum triglyceride in this study (97.36 mg/dL) was considerably lower than the reported population mean of approximately 150 mg/dL (DeBakey et al., 1984). The majority of respondents had similar triglyceride levels thereby limiting the utility of an analysis for group differences between contrasted groups. Therefore, hypothesis four was only partially supported. Summary statistics for all group comparisons are presented in Table 6.

Although the relationship between triglyceride level and coronary heart disease risk is not as well defined as it is for cholesterol, researchers have determined that there is an inverse relationship between serum triglyceride and high density lipoprotein (HDL) levels. HDL, a type of lipoprotein, has been associated with a decreased risk of coronary heart disease (DeBakey et al., 1984). Individuals with high triglyceride concentrations tend to have low HDL concentrations and less protection against coronary heart disease. The pathophysiologic mechanisms of serum triglyceride need further definition but lower levels of triglyceride would appear to afford increased protection from the risk of coronary heart disease.

Hypothesis Five

The fifth hypothesis predicted that there would be a significant positive relationship between the TSDF leisure score and the amount of time spent in leisure activity

Table 6. Sample Size, Means, Standard Deviations, and Results of *t* Tests for Hypotheses Concerning Fasting Serum Triglyceride

Group	*n*	Mean	*SD*	*t*	*df*	*p*
High Work Score (>9.5)	45	97.7	79.1	-0.08	69	.7724
Low Work Score (<2.5)	26	98.4	76.8			
High Social Score (>11.0)	57	94.3	71.6	-.36	83	.7180
Low Social Score (<4.0)	28	100.7	86.4			
High Health Score (>9.0)	55	77.0	36.9	-2.40	29.4	.0232
Low Health Score (<1.0)	25	114.8	74.8			
High Total Score (>33.0)	38	100.9	79.3	-1.57	64	.1176
Low Total Score (<17.2)	28	113.1	85.3			

Note. Analysis for the leisure score was omitted because only four respondents' scores were high enough to fall into the high leisure score group. Fractional degrees of freedom resulted from unequal sample variances.

during a typical week. Essentially no association was obtained for respondents (n = 253) who were measured on both variables (r = .04, p<.5473). Therefore, hypothesis five was not supported.

Many of the respondents commented that a number of the leisure activities in which they engage were not presented in the TSDF leisure area. This problem was amplified when only four respondents could be placed in the high score group (greater than one standard deviation above the normative mean) even though participants reported spending nearly 10 hours per week engaged in leisure activities. In light of the fact that leisure checklists may exceed 100 items, it is not surprising that respondents could not find favored activities in the 10 item TSDF leisure area (Neulinger, 1981). Unlike the work, social, and health areas of life style effectiveness in which items have a high degree of generality, it is difficult to quantify the leisure experience with 10 discrete items.

The quantity of an experience does not necessarily correspond to the quality of that experience. Although no attempt was made to obtain a detailed measure of satisfaction with leisure activity, participants were asked if they were satisfied with their leisure activity. Of the four respondents whose leisure scores placed them in the high score group, only one (25%) expressed satisfaction with leisure activity, whereas 47 of 90 respondents (52%)

in the low leisure score group expressed satisfaction with their leisure activity. It would appear that the TSDF leisure area of life style effectiveness is not detailed enough to quantify leisure activity in an accurate manner.

Factor Analysis

In addition to testing the five research hypotheses, two questions, related to areas in which lack of sufficient information precluded the formulation of hypotheses, were explored. The first question addressed the issue of correspondence between the initial logical placement of the 40 TSDF items into the four areas of life style effectiveness (work, social, health, and leisure) and the factor analytic placement of the items following application of principal component analysis as the initial factoring method followed by orthogonal varimax rotation.

Two strategies were used to select items for initial factoring. The first strategy was related to consideration of the conceptual and empirical strength of the leisure items. Conceptually, the TSDF leisure items did not adequately sample the leisure domain (Neulinger, 1981). Empirically, the testing of hypothesis five failed to support a relationship between the TSDF leisure score and the number of hours that respondents engaged in leisure activities. Given that the leisure score was likely to be error-prone, it was decided to eliminate the

leisure items from consideration in the factor analysis. The second strategy involved elimination of items with corrected item to total correlations of less than .20 (Nunnally, 1978). Application of this strategy resulted in elimination of eight items (flossing my teeth, filing work materials, using hard drugs, getting adequate rest at night, smoking cigarettes, reprimanding others, drinking water, and reading course/professionally related materials), leaving a total of 22 items for factor analysis. Cronbach's alpha increased from .74 for the 40-item version to .80 for the 22-item version.

Application of the varimax method of rotation of principal factors with eigenvalues greater than unity led to a solution with seven dimensions. The procedure yielded a total final communality estimate of 12.94 with 58.83% of the total variance explained by the seven rotated factors. Communality estimates by the percentages of variance explained by the seven factors are presented in Table 7.

A factor loading of .30 was used as the minimum criterion for placement of an item within a factor. The factor loadings on the items enumerated in Table 8 indicate that the seven common interpretable factors bear reasonable correspondence to the original placement of the TSDF items after accounting for items eliminated before analysis.

Table 7. Communality Estimates and Percentages of Variance Explained

	Factor						
	1	2	3	4	5	6	7
Communality estimate	2.21	2.04	1.97	1.85	1.83	1.57	1.47
Percentage of variance explained	10.05	9.27	8.96	8.41	8.32	7.14	6.68
Cumulative percentage	10.05	19.32	28.28	36.69	45.01	52.15	58.83

Table 8. Rotated Factor Matrix with Factor Loadings and Communalities

Item	Factor 1	2	3	4	5	6	7	Communality
3	.63	.03	.05	.34	-.05	-.12	.15	.56
6	-.04	.08	.04	.65	.34	.01	-.10	.56
7	-.08	.17	-.03	-.02	.28	.10	.61	.49
11	.12	.13	-.10	-.07	.76	.01	.14	.65
12	.71	-.02	.17	.01	-.05	-.02	.08	.55
16	.31	.35	.03	.39	.07	.03	-.26	.45
17	.32	.73	-.03	-.16	-.01	.05	-.03	.67
18	.11	.01	.72	.02	.06	-.06	-.27	.61
20	.04	-.05	-.05	-.23	.44	-.01	.56	.57
21	.63	.11	.21	.15	.19	.15	-.15	.55
22	.07	.04	.01	.06	-.01	.86	-.01	.75
25	.30	.10	.31	.38	-.04	.14	-.13	.38
26	-.13	.71	.12	.02	.18	.01	.11	.53
30	.06	.13	.12	.10	.80	.04	.12	.70
31	.65	.19	.22	-.03	.25	.11	-.09	.60
34	.22	-.09	.09	.65	-.11	.08	.18	.54
35	.07	.67	-.01	.15	.17	.15	.26	.59
36	.14	-.04	.77	.08	-.02	-.07	.17	.65
41	.01	.09	-.03	.09	.05	.83	.08	.72
44	.07	.02	.06	.71	-.12	.09	-.15	.56
45	.12	.59	.11	.01	-.09	-.01	.48	.61
46	.19	.10	.72	.04	-.01	.05	.09	.58

Note. n = 436. Items that loaded on factors are underlined.

Factor one contains four of the five items initially labeled negative social (rambling in conversation, criticizing others behind their backs, interrupting others during conversation, and dominating conversation) and remains categorized as a negative social factor. The one item missing from the initial grouping (reprimanding others) was eliminated prior to the factor analysis.

Factor two, with four of the five original positive social items (starting a conversation, encouraging others, showing affection toward others, and listening closely to others' comments) loading, remains categorized as a positive social factor. The third factor contains three of the five original negative health items (eating excessively, eating junk food, and gulping meals). The remaining two items (using hard drugs and smoking cigarettes) were eliminated before analysis in accordance with the recommendation of Nunnally (1978).

Factor four contains all five of the original negative work items (over extending myself in work commitments, jumping from one task to another, putting off unpleasant but necessary tasks, losing work related materials, and failing to meet deadlines). Although the task jumping and putting off items loaded on factor four, their loadings and communalities are lower than those of the other 20 items. Additionally, these two items had loadings of approximately equal magnitude on other factors. This

indicates that these items do not tend to contribute as much conceptual clarity to their factor as would be desired.

The fifth factor, with two of the original five positive work items (setting work goals and reaching work goals), can be categorized as goal orientation. Two of the five original positive work items (filing work materials and reading course/professionally related materials) were eliminated before analysis. The fifth of the original five positive work items (completing work assignments on time) loaded on factor seven.

The two items loading on factor six (participating in vigorous physical activity and doing stretching exercises) were the only two positive health items that were not eliminated prior to analysis. This factor may best be categorized as physical activity. The positive health items eliminated before analysis were flossing my teeth, getting adequate rest at night, and drinking water. These three items are conceptually distinct from the retained items. The last factor extracted did not bear close correspondence to any of the originally conceived areas of life style effectiveness. Two items (keeping my word and completing work assignments on time) loaded on this factor. The original placement of these items was in the positive social and positive work areas respectively. Although the behaviors exemplified by the two items in this factor

logically are important social and work attributes, empirically a stronger common factor, identified as dependability has been found.

Association of Factor Analysis Derived Areas of Life Style Effectiveness to Health Indicators

The second question addressed whether the TSDF scores of areas of life style effectiveness formed from a factor analysis solution were more strongly associated with the health indicator variables (serum cholesterol and triglyceride, locus of control, and JAS scale scores) than were the TSDF scores of life style effectiveness formed on the basis of the original placement of items. Results of Pearson correlations between the newly derived factors and the above health indicator variables are presented in Table 9.

Comparisons of relationships between the health indicator measures and the original TSDF areas of life style effectiveness scores (Table 3) and the factor analysis derived TSDF scores (Table 9) must be made with caution because individual factors in Table 9 are composed of either all positive or all negative items. This is in sharp contrast to the original scores, which are composites of the positive minus the negative items for the work, social, and health areas of life style effectiveness. Factors 1, 3, and 4, comprising negative social, health, and work items respectively, are all positively correlated with the JAS Type A, Factor S, and Factor J scale scores.

Table 9. Correlation Matrix of Factor Analysis Derived Areas of Life Style Effectiveness with Health Indicator Variables

Variables	Type A	Factor S	Factor J	Factor H	Locus of Control	Cholesterol	Triglyceride
Factor I (negative social)	.24 .0001	.35 .0001	.20 .0001	-.02 .6094	.10 .1231	.04 .5774	-.09 .1995
Factor II (positive social)	.14 .0024	-.08 .0928	.28 .0001	.02 .6094	-.11 .0893	.01 .9396	-.07 .3391
Factor III (negative health)	.14 .0024	.39 .0001	.14 .0024	-.08 .0928	.23 .0002	-.05 .4599	-.08 .2954
Factor IV (negative work)	.18 .0002	.18 .0002	.13 .0048	.04 .4334	.04 .4334	-.06 .4310	-.04 .5774
Factor V (goal orientation)	.17 .0003	-.12 .0085	.06 .2081	.24 .0001	-.13 .0313	.07 .3391	-.03 .6376
Factor VI (physical activity)	.07 .1658	-.07 .1658	.28 .0001	-.01 .9435	-.10 .1231	-.14 .0431	-.17 .0182
Factor VII (dependability)	.02 .6094	-.06 .2081	.04 .4334	.20 .0001	-.11 .0893	.06 .4310	-.04 .5774
New Total	-.09 .0647	-.34 .0001	.01 .8203	.12 .0085	-.25 .0001	-.01 .9396	-.01 .9396

Note. The first number in each entry is r and the second is p. n = 198 for cholesterol and triglyceride. n = 257 for locus of control. n = 453 for all other variables.

Correlations ranged from r = .13. p<.0048 for Factor 4 (negative work) and Factor J (Job Involvement) to r = .39, p<.0001 for Factor 3 (negative health) and Factor S (Speed and Impatience). In general, relationships between the JAS Speed and Impatience scale scores were salient conceptual and empirical indicators of TSDF criterion validity.

The relationships between locus of control and the new TSDF scores were theoretically consistent in that respondents with an internal locus tended to score high on the positive factors and low on the negative factors. The strongest relationship was with Factor III (negative health) (r = .23, p<.0002), indicating that internals (persons who score low on the locus of control instrument) tend to score low on the negative health items. Overall, there was conceptual and empirical consistency between relationships of locus of control with original (Table 4) and new (Table 9) TSDF scores of life style effectiveness.

Relationships between the new factors and fasting serum cholesterol and triglyceride generally were low and inconsistent. The strongest associations, both conceptually and empirically, were found between factor six (physical activity) and serum cholesterol (r = -.14, p<.05) and serum triglyceride (r = -.17, p<.02). These findings are supported by the research of Superko et al. (1985) who reported that exercise was effective in lowering serum lipoprotein levels.

Examination of results obtained for associations between the health indicator variables with both the initial TSDF areas of life style effectiveness and the factor analytic placement of items indicated that one approach was not consistently superior to the other. The factors derived from the factor analysis are subsets of the original TSDF areas. The new factors are limited because each contains only positive or negative behaviors. The original TSDF areas of life style effectiveness contained both positive and negative behaviors within each area, making direct comparisons between the two sets difficult. The most straightforward comparisons would be between the original and new total scores and the health indicators because both old and new total scores are composites of positive and negative behaviors. These comparisons indicate virtually no difference in the strength or explanatory power of the associations.

The areas of life style effectiveness developed through application of factor analysis do offer some benefits. One benefit is parsimony; the number of items has been reduced from 40 to 22. Another benefit is that separation of behaviors into positive (enhancing) and negative (avoidance) areas offers an opportunity to more fully understand the conceptual and empirical determinants of a healthy life style. This clarification could lead to more appropriate measurement of areas of life style effectiveness.

Summary

The results partially supported the hypothesis that each of the JAS scale scores (Type A, Speed and Impatience, Job Involvement, and Hard-Driving and Competitiveness) would be negatively related to each of the TSDF areas of life style effectiveness (work, social, health, leisure, and total). The strongest support for this research hypothesis came from the association between the JAS Speed and Impatience scale score and the TSDF social, health, and total scores of life style effectiveness. A second hypothesis that predicted inverse relationships between locus of control and the TSDF areas of life style effectiveness was supported. The results did not support the hypothesis that high TSDF score groups for each area of life style effectiveness would have significantly lower fasting serum cholesterol levels than the corresponding low TSDF score groups. Partial support was obtained for the hypothesis that predicted high TSDF score groups for each area of life style effectiveness would have significantly lower fasting serum triglyceride levels than the corresponding low TSDF score groups. There was no support for the final research hypothesis that predicted a significant positive relationship between the TSDF leisure score and the amount of time spent in leisure activity during a typical week.

In general, the factor analytic placement of TSDF items into areas of life style effectiveness corresponded well to the initial placement of items. Relationships between the new factors and the health indicator variables were generally comparable to the associations between the original areas and the health indicators.

CHAPTER V

CONCLUSIONS AND IMPLICATIONS

This study has focused on relationships between indicators of health and health-protecting (avoidance of negative) and health-enhancing (promotion of positive) behaviors contained in the Tennessee Self-Description Form (TSDF). The results indicate that the relationship of life style to health is multidimensional. Additionally, the results of this study imply support for the substantive hypothesis that a variety of positive and negative behaviors displayed by a nonclinical population can be grouped into areas of life style effectiveness that are conceptually and empirically related to health indicators. Further investigation in this area may lead to continued refinement of our understanding of health as something more than the absence of disease.

The findings of this study provide support for links between traditional life style risk factors and health that have been identified in previous studies. Finally, the results offer beginning evidence for the interrelationships between health and commonplace activities such as general patterns of work and social behavior that have not been the subject of extensive life style and health research. Initial validation of the TSDF for use as a research measure of life style as a health-specific construct has been presented.

The results of the factor analysis illustrate an important relationship between factor analysis concepts and scientific generalization; the factor loadings suggest groups of items that are representative of underlying characteristics. Exploration of the factor structure of the TSDF has provided a measure of support for the grouping of questionnaire items into categories that have substantive meanings. An interesting feature of this factor analysis concerns the absence of bipolar factors (factors that load positively on some items and negatively on others). A similar finding was reported by Walker et al. (1987) in their factor analysis of health-promoting behaviors. Items related to the avoidance of certain behaviors (negative practices) comprised distinct factors rather than being incorporated as positive and negative aspects of the same factors.

The loading of positive and negative items on separate factors could be related to the conceptual distinction between health-enhancing or positive behaviors and health-protecting or avoidance of negative behaviors. This distinction may have practical significance in that it addresses the need for incorporation of both participation and avoidance behaviors into measurement of life style as a health-specific construct.

Implications for Future Research

Because there has been little research effort directed toward development of reliable and valid instruments for measuring life style effectiveness as a health-specific construct, it is important that continued refinement and validation of the TSDF be the focus of further investigation. Although the magnitude of the relationships obtained was modest, the results of this study support the logical assertion that the way people live, what they do from day to day, can affect their health in both positive and negative ways. Further investigation should be conducted to determine whether the relationships between life style effectiveness and the criterion variables used in this study can be replicated. Subjects in this study were either volunteers for a health screening or members of a health profession. Future investigations could extend the external validity of this study's findings by using samples that would not be classified as likely to be health conscious. Investigations using samples that are representative of various clinically determined states of health and illness, various socioeconomic levels, and diverse cultural and racial characteristics should be conducted to continue validation of the TSDF.

The influence of life style on health is most appropriately investigated within a longitudinal time frame.

For this reason, some future studies should be planned to extend over several years so that potential fluctuations in criterion measures could be related to potential changes in subjects' areas of life style effectiveness.

Further research is need to explore and clarify the relationship between health-protecting (avoidance of negative) and health-enhancing (promotion of positive) behaviors. Future studies should explore the underlying motivations individuals have for avoidance of or movement away from disliked or feared behaviors versus adoption of or movement toward desired behaviors.

The impact of frequently occurring minor stressors (hassles) on health has been the subject of recent research (Lazarus, 1984; Weinberger, Hiner, & Tierney, 1987) Future studies should be planned to determine the relationships among daily hassles, life style effectiveness, and health indicators. These studies should include an examination of the influence of life style effectiveness as a potential mediator of stress and strain encountered in daily actions.

Leisure activity has been reported to be positively related to life satisfaction. Unfortunately, the TSDF leisure area of life style effectiveness was unable to discriminate adequately with respect to amount of leisure activity. Future studies should either measure leisure activity separately or attempt to operationalize leisure as a manageable set of behaviors that have generalizability across individuals.

Future studies should explore the connection between the new factor labeled trust and health indicators. The conceptual meaning attached to this factor is different than the basis used for initial categorization of behaviors into areas of life style effectiveness. Items that expand on this new factor should be added to provide a more complete understanding of how this factor might relate to health.

Implications for Practice

Before discussing the implications that the findings of this study have for practice, the author must stress that, at this point in its development, the TSDF should be viewed as a research instrument rather than a diagnostic test. This distinction is comparable to the one between instruments labeled as tests versus those labeled as assessments. Kaplan and Saccuzzo (1982) have described tests as instruments that meet the following criteria: (a) standardized procedures for administration, scoring, and interpretation; (b) presence of a well described normative sample, and (c) empirical evidence that supports its reliability and validity. Instruments that do not meet these requirements need to be categorized as assessments.

The goal of assessment is evaluation of an individual for the purpose of description in terms of current functioning (Kaplan & Saccuzzo, 1982). Consideration of test

criteria and the goal of assessment leads to the conclusion that the TSDF should be viewed as an assessment tool or technique.

As an assessment tool, the TSDF should help practitioners evaluate current functioning in areas of life style effectiveness. This application can identify behavioral assets, excesses, and deficits. Measurements obtained from the TSDF can serve as an adjunct in the design of specific treatment programs by helping the practitioner understand the assets, excesses, and deficits an individual has in his/her behavioral repertoire. It would then be possible for the practitioner to help clients capitalize on the resources they have before attempting to teach them any new skills. This application is related to the concept of learned resourcefulness proposed by Rosenbaum (1983). He described learned resourcefulness as an acquired set of behaviors and skills that a person uses for self-regulation when events interfere with the smooth execution of daily activities.

The strongest recommendation for the use of the TSDF as an assessment tool may be that it could enhance open communication between the client and the practitioner. Such communication is essential not only for valid assessment but also for appropriate intervention.

LIST OF REFERENCES

References

Abbot, A. V., Peters, R. K., & Vogel, M. E. (1985). Correspondence: Type A behavior and survival after myocardial infarction. The New England Journal of Medicine, 313, 450-451.

Allen, L. R. (1982). The relationship between Murray's personality needs and leisure interests. Journal of Leisure Research, 14, 63-76.

Arakelian, M. (1980). An assessment and nursing application of the concept of locus of control. Advances in Nursing Science, 2, 25-42.

Arlow, J. A. (1945). Identification mechanisms in coronary occlusions. Psychosomatic Medicine, 7, 195-209.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review, 84, 191-215.

Beery, W. L., Wagner, E. H., & Schoenbach, V. J. (1981). A shopper's guide to appraisal instruments. Promoting health, 2, 6-10.

Bellack, A. S., & Schwartz, J. S. (1976). Assessment for self-control programs. In M. Hersen & A. S. Bellack (Eds.), Behavioral assessment: A practical handbook. New York: Pergamon Press.

Belloc, N. B., & Breslow, L. (1972). Relationship of physical health status and health practices. Preventive Medicine, 1, 409-421.

Berg, C., & Neulinger, J. (1976). The alcoholic's perception of leisure. Journal of Studies on Alcohol, 37, 1625-1632.

Berkman, L. F., & Breslow, L. (1983). Health and ways of living. New York: Oxford University Press.

Berry, C. S. (1981). Good health for employees and reduced health care costs for industry. Washington, D. C.: Health Insurance Association of America.

Breslow, L., & Enstrom, J. E. (1980). Persistence of health habits and their relationship to mortality. Preventive Medicine, 9, 469-483.

Brown, N., Muhlenkamp, A., Fox, L., & Osborn, M. (1983). The relationship among health beliefs, health values, and health promotion activity. Western Journal of Nursing Research,5, 155-163.

Buchanan, T. (1983). Toward an understanding of variability in satisfaction within activities. Journal of LeisureResearch, 15, 39-51.

Byrne, D. G. (1981). Type A behaviour, life events and myocardial infarction: Independent or related risk factors. British Journal of Medical Psychology, 54, 371-377.

Byrne, D. G., Rosenman, R. H. (1986). The Type A behaviour pattern as a precursor to stressful life-events: A confluence of coronary risks. British Journal of Medical Psychology, 59, 75-82.

Byrne, D. G., & Whyte, H. M. (1980). Life events and myocardial infarction revisited: The role of measures of individual impact. Psychosomatic Medicine, 42, 1-10.

Caffrey, B. (1968). Reliability and validity of personality and behavioral measures in a study of coronary heart disease. Journal of Chronic Diseases, 21, 191-204.

Carlson, L. A., & Bottiger, L. E. (1981). Serum triglycerides, to be or not to be a risk factor for ischemic heart disease. Atherosclerosis, 39, 287-291.

Case, R. B., Heller, S. S., Case, N. B., Moss, A. J. (1985). Type A behavior and survival after acute myocardial infarction. The New England Journal of Medicine, 312, 737-741.

Cattell, R. B. (1965). Factor analysis: An introduction to essentials. Biometrics, 21, 405-435.

Chesney, M. A., Eagleston, J. R., & Rosenman, R. H. (1981). Type A behavior: Assessment and intervention. In C. K. Prokop & L. A. Bradley (Eds.), Medical psychology: Contributions to behavioral medicine (pp. 19-36). New York: Academic Press.

Cohen, W. S. (1985). Health promotion in the workplace: A prescription for good health. American Psychologist, 40, 213-216.

Conner, W. E., & Connor, S. L. (1977). Dietary treatment of hyperlipidemia. In B. M. Rofkind and R. I. Levy (Eds.), Hyperlipidemia - diagnosis and therapy (pp. 58-71). New York: Grune and Stratton.

Conrad, P., & Kern, R. (1981). The sociology of health and illness. New York: St. Martin's Press.

Dawber, T. R. (1980). The Framingham Study: The epidemiology of atherosclerotic disease. Cambridge: MA: Harvard University Press.

Dearborn, M. J., & Hastings, J. E. (1987). Type A personality as a mediator of stress and strain in employed women. Journal of Human Stress, 13, 53-60.

DeBakey, M. E., Gotto, A. M., Scott, L. W., & Foreyt, J. P. (1984). The living heart diet. New York: Simon & Schuster.

Dever, G. E. A. (1980). Community health analysis. Germanton, MD: Aspen Systems Corporation.

Dimsdale, J. E. (1988). A perspective on Type A behavior and coronary disease. The New England Journal of Medicine, 318, 110-112.

Dreyfuss, F., & Czaczkes, J. W. (1959). Blood cholesterol and uric acid of healthy medical students under stress of an examination. Archives of Internal Medicine, 103, 708-711.

Dubos, R. (1980). Man adapting. New Haven: Yale University Press.

Dunbar, F. (1943). Psychosomatic diagnosis. New York: Hoeber and Harper.

Engel, G. L. (1977). The need for a new medical model: A challenge for biomedicine. Science, 196, 129-136.

Friedman. M. (1969). Pathogenesis of coronary artery disease. New York: McGraw-Hill.

Friedman, M. (1985). Correspondence: Type A behavior and survival after myocardial infarction. The New England Journal of Medicine, 313, 450.

Friedman, M., & Rosenman, R. H. (1959). Association of a specific overt behavior pattern with blood and cardiovascular findings: Blood cholesterol level, blood clotting time, incidence of arcus senilis and clinical coronary artery disease. Journal of the American Medical Association, 169, 1286-1296.

Friedman M., & Rosenman, R. H. (1974). Type A behavior and your heart. New York: Alfred A. Knopf.

Friedman, M., Rosenman, R. H., & Carroll, V. (1958). Changes in the serum cholesterol and blood-clotting time in men subjected to cyclic variation of occupational stress. Circulation, 17, 852-861.

Friedman, M., & Ulmer, D. (1984). Treating Type A behavior--and your heart. New York: Alfred A. Knopf.

Fulwood, R., Rifkind, B. M., Havlik, R. J., Russell-Briefel, R., Lippel, K., & Sempos, C. (1987). Trends in serum cholesterol levels among US adults aged 20 to 74 years. Journal of the American Medical Association, 257, 937-942.

Gorsuch, R. L. (1974). Factor analysis. Philadelphia: W. B. Saunders.

Greenberg, J. S. (1984). Managing stress: A personal guide. Dubuque, Iowa: Wm. C. Brown Publishers.

Guyton, A. C. (1976). Textbook of medical physiology (5th ed.). Philadelphia: W. B. Saunders.

Halperin, P. J., & Littman, A. B. (1985). Correspondence: Type A behavior and survival after myocardial infarction. The New England Journal of Medicine, 313, 450.

Haynes, S. G., Feinleib, M., & Kannel, W. B. (1980). The relationship of psychosocial factors to coronary heart disease in the Framingham study: III. Eight year incidence of coronary heart disease. American Journal of Epidemiology, 111, 37-58.

Haynes, S. G., Feinleib, M., Levine, S., Scotch, N. A., & Kannel, W. B. (1978). The relationship of psychosocial factors to coronary heart disease in the Framingham study: II. Prevalence of coronary heart disease. American Journal of Epidemiology, 107, 384-402.

Heffernan, J. A., & Albee, G. W. (1985). Prevention perspectives: From Vermont to Washington. American Psychologist, 40, 202-204.

Hubbard, P., Muhlenkamp, A. F., & Brown, N. (1984). The relationship between social support and self-care practices. Nursing Research, 33, 266-270.

Hyner, G. C., & Melby, C. L. (1985). Health risk appraisal: Use and misuse. Family & Community Health, 7, 13-25.

Jenkins, C. D. (1979). An approach to the diagnosis and treatment of problems of health-related behavior. International Journal of Health Education, 22, (Suppl. 2), 3-24.

Jenkins, C. D., Hames, C. G., & Zyzanski, S. J. (1969). Psychological traits and serum lipids. Psychosomatic Medicine, 31, 115-128.

Jenkins, C. D., Zyzanski, S. J., & Rosenman, R. H. (1979). JAS manual. New York: The Psychological Corporation.

Jenkins, C. D., Zyzanski, S. J., Rosenman, R. H., & Cleveland, G. L. (1971). Association of coronary-prone behavior pattern scores with recurrence of coronary heart disease. Journal of Chronic Diseases, 24, 601-611.

Jozwiak, J. S. (1985). [Comparison of Jenkins Activity Survey Form C and Form N scale scores for an unemployed sample]. Unpublished raw data.

Jozwiak, J. S., & Williams, R. L. (1985, March). The relationship of self-management effectiveness to measures of health. Poster session presented at the annual meeting of The Society of Behavioral Medicine, New Orleans.

Kaiser, H. F. (1974). An index of factorial simplicity. Psychometrika, 39, 31-36.

Kanfer, F. H. (1977). The many faces of self-control, or behavior modification changes its focus. In R. B. Stuart (Ed.), Behavioral self-management: Strategies, techniques and outcome. New York: Brunner/Mazel.

Kannel, W. B., & Dawber, T. R. (1982). Contributors to coronary risk: Ten years later. Heart & Lung, 11, 60-64.

Kaplan, R. M., & Saccuzzo, D. P. (1982). Psychological testing: Principles, applications, and issues. Monterey, California: Brooks/Cole Publishing Company.

Karoly, P., & Kanfer, F. H. (1982). Self-management and behavior change: From theory to practice. New York: Pergamon Press.

Keefe, F. J., & Blumenthal, J. A. (1982). Behavioral medicine: Basic principles and theoretical foundations. In F. J. Keefe & J. A. Blumenthal (Eds.), Assessment strategies in behavioral medicine (pp. 3-16). New York: Grune & Stratton.

Kelly, J. R., Steinkamp, M. W., & Kelly, J. R. (1987). Later life satisfaction: Does leisure contribute? Leisure Sciences, 9, 189-199.

Ketterer, M. W. (1985). Correspondence: Type A behavior and survival after myocardial infarction. The New England Journal of Medicine, 313, 449.

Kim, J. O., & Mueller, C. W. (1978a). Introduction to factor analysis: What it is and how to do it. Beverly Hills, CA: Sage Publications Inc.

Kim, J. O., & Mueller, C. W. (1978b). Factor analysis: Statistical methods and practical issues. Beverly Hills, CA: Sage Publications Inc.

Knowles, J. F. (1977). Doing better and feeling worse. New York: Norton.

Kornitzer, M., Kittel, F., & DeBacker, G. (1981). The Belgian heart disease prevention project: Type A behavior pattern and the prevalence of coronary heart disease. Psychosomatic Medicine, 43, 133-145.

Lalonde, M. (1975). A new perspective on the health of Canadians. Ottawa: Information Canada.

Lambert, W. W., MacEvoy, B., Klackenberg-Larsson, I., Karlberg, P., & Karlberg, J. (1987). The relation of stress hormone excretion to Type A behavior and to health. Journal of Human Stress, 13, 128-135.

Lazarus, R. S. (1984). Puzzles in the study of daily hassles. Journal of Behavioral Medicine, 7, 375-389.

Lefcourt, H. (1976). Locus of control. Hillsdale, NJ: Lawrence Erlbaum Associates.

Mahoney, M. J., & Thoresen, C. E. (1974). Self-control: Power to the person. Monterey, CA: Brooks/Cole.

Manning, D. T., Balson, P. M., Hunter, S. M., Berenson, G. S., & Willis, A. S. (1987). Comparison of the prevalence of Type A behavior in boys and girls from two contrasting socioeconomic status groups. Journal of Human Stress, 13, 116-120.

Matarazzo, J. D. (1980). Behavioral health and behavioral medicine. American Psychologist, 35, 807-817.

Matthews, K. A. (1982). Psychological perspectives on the Type A behavior pattern. Psychological Bulletin, 91, 293-323.

Matthews, K. A., Glass, D. C., Rosenman, R. H., & Bortner, R. (1977). Competitive drive, pattern A and coronary heart disease: A further analysis of some data from the Western Collaborative Group Study. Journal of Chronic Diseases, 30, 489-498.

Mechanic, D., & Cleary, P. D. (1980). Factors associated with the maintenance of positive health behavior. Preventive Medicine, 9, 805-814.

Michael, J. M. (1982). The second revolution in health: Health promotion and its environmental base. American Psychologist, 37, 936-941.

Milsum, J. H. (1984). Health, stress, and illness: A systems approach. New York: Praeger Publishers.

Muhlenkamp, A., & Sayles, J. A. (1986). Self-esteem, social support, and positive health practices. Nursing Research, 35, 334-338.

Naditch, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs, 80, 1-44.

Neulinger, J. (1981). To leisure: An introduction. Boston: Allyn and Bacon, Inc.

Nirenberg, T. D., Ersner-Hershfield, S., Sobell, L. C., & Sobell, M. B. (1981). Behavioral treatment of alcohol problems. In C. K. Prokop & L. A. Bradley (Eds.), Medical psychology: Contributions to behavioral medicine (pp. 267-290). New York: Academic Press.

Nunnally, J. C. (1978). Psychometric theory (2nd ed.). New York: McGraw-Hill Book Company.

Pear, R. (1987, February 10). U. S. health care costs soar, data show. The Knoxville News-Sentinel, pp. 1, 14.

Pell, S., & Fayerweather, W. E. (1985). Trends in the incidence of myocardial infarction and in associated mortality and morbidity in a large employed population, 1957-1983. The New England Journal of Medicine, 312, 1005-1011.

Phares, E. J., & Lamiell, J. T. (1974). Internal-external control and defensive preferences. Journal of Clinical and Consulting Psychology, 42, 872-878.

Podell, R. N. (1983). Lipids, nutrition, and coronary heart disease. In R. N. Podell & M. M. Stewart (Eds.), Primary prevention of coronary heart disease: A practical guide for the clinician (pp. 93-96). Reading, MA: Addison-Wesley Publishing Company.

Prokop, C. K., & Bradley, L. A. (1981). The relationship between medical psychology and behavioral medicine. In C. K. Prokop & L. A. Bradley (Eds.), Medical psychology: Contributions to behavioral medicine (pp. 1-4). New York: Academic Press.

Raghab, M. G., & Beard, J. C. (1982). Measuring leisure attitude. Journal of Leisure Research, 14, 155-167.

Ragland, D. R., & Brand, R. J. (1988). Type A behavior and mortality from coronary heart disease. The New England Journal of Medicine, 318, 65-69.

Rahe, R. H., Rubin, R. T., Arthur, R. J., & Clark, B. R. (1968). Serum uric acid and cholesterol variability: A comprehensive view of underwater demolition team training. Journal of the American Medical Association, 206, 2875-2880.

Rifkind, B. M., & Lenfant, C. (1986). Cholesterol lowering and the reduction of coronary heart disease risk. Journal of the American Medical Association, 256, 2872-2873.

Roadburg, A. (1983). Freedom and enjoyment: Disentangling perceived leisure. Journal of Leisure Research, 15, 15-26.

Robbins, L. C., & Hall, J. H. (1970). How to practice prospective medicine. Indianapolis: Methodist Hospital of Indiana.

Rosenbaum, M. (1983). Learned resourcefulness as a behavioral repertoire for the self-regulation of internal events: Issues and speculations. In M. Rosenbaum, C. M. Franks, & Y. Jaffe (Eds.), Perspectives on behavior therapy in the eighties (pp. 54-73). New York: Springer Publishing Company.

Rosenbaum, M., & Raz, D. (1977). Denial, locus of control, and depression among physically disabled and nondisabled men. Journal of Clinical Psychology, 33, 672-676.

Rosenman, R. H. (1978). The interview method of assessment of the coronary-prone behavior pattern. In T. M. Dembroski, S. M. Weiss, J. L. Shields, S. G. Haynes, & M. Feinleib (Eds.), Coronary-prone behavior (pp. 55-69). New York: Springer-Verlag.

Rosenman, R. H. (1983). Coronary-prone behavior pattern and coronary heart disease: Implications for the use of beta-blockers in primary prevention. In R. H. Rosenman (Ed.), Psychosomatic risk factors and coronary heart disease. Bern: Hans Huber.

Rosenman, R. H., Brand, R. J., Jenkins, C. D., Friedman, M., Straus, R., & Wurm, M. (1975). Coronary heart disease in the Western Collaborative Group Study: Final follow-up experience of 8.5 years. Journal of the American Medical Association, 233, 872-877.

Rosenman, R. H., Friedman, M., Straus, R., Wurm, M., Kositchek, R., Hahn, W., & Werthessen, N. T. (1964). A predictive study of coronary heart disease: The Western Collaborative Group Study. Journal of the American Medical Association, 189, 15-22.

Rotter, J. B. (1954). Social learning and clinical psychology. Englewood Cliffs, NJ: Prentice-Hall.

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs, 80, 1-44.

Ruberman, W., Weinblatt, E., Goldberg, J. D., & Chaudhary, B. S. (1984). Psychosocial influences on mortality after myocardial infarction. The New England Journal of Medicine, 311, 552-559.

Sandler, I. N., & Lakey, B. (1982). Locus of control as a stress moderator: The role of control perceptions and social support. American Journal of Community Psychology, 10, 65-80.

SAS Institute Inc. (1985). SAS user's guide: Statistics, (5th ed.). Cary, NC: Author.

Schallow, J. R. (1975). Locus of control and success at self-modification. Behavior Therapy, 6, 667-671.

Schwartz, G. E., & Weiss, S. M. (1978). Yale conference on behavioral medicine: A proposed definition of statement of goals. Journal of Behavioral Medicine, 1, 3-14.

Sessoms, H. D. (1986). Of time, work, and leisure revisited. Leisure Sciences, 8, 107-113.

Shekelle, R. B., Schoenberger, J. A., & Stamler, J. (1976). Correlates of the JAS Type A behavior score. Journal of Chronic Diseases, 29, 381-394.

Sloane, R. B., Habib, A., Eveson, M. B., & Payne, R. W. (1961). Some behavioral and other correlates of cholesterol metabolism. Journal of Psychosomatic Research, 5, 183-186.

Stamler, J. (1985). Coronary heart disease: Doing the "right things". The New England Journal of Medicine, 312, 1053-1055.

Stevens, J. H., Turner, C. W., Rhodewalt, F., & Talbot, S. (1984). The Type A behavior pattern and carotid artery atherosclerosis. Psychosomatic Medicine, 46, 105-113.

Stuart, R. B., Mitchell, C., & Jensen, J. A. (1981). Therapeutic options in the management of obesity. In C. K. Prokop & L. A. Bradley (Eds.), Medical psychology: Contributions to behavioral medicine (pp. 321-353). New York: Academic Press.

Stunkard, A. J. (1979). Behavioral medicine and beyond: The example of obesity. In O. F. Pomerleau & J. P. Brady (Eds.), Behavioral medicine: Theory and practice (pp. 279-298). Baltimore: The Williams & Wilkins Company.

Superko, H. R., Haskell, W. L., & Wood, P. D. (1985). Modification of plasma cholesterol through exercise. Postgraduate Medicine, 78, 64-75.

Szalai, A. (1972). The use of time. Paris: Mouton

Szatrowski, T. P., Peterson, A. V., Shimizu, Y., Prenti R. L., Mason, M. W., Fukunaga, Y., & Kato, H. (1984 Serum cholesterol, other risk factors and cardiovascu disease in a Japanese cohort. Journal of Chronic Diseases, 37, 569-584.

Theorell, T., Lind, E., & Floderus, B. (1975). The relationship of disturbing life changes and emotions to the early development of myocardial infarction and other serious illness. International Journal of Epidemiology, 4, 281-293.

Theorell, T., & Rahe, R. H. (1974). Psychological characteristics of subjects with myocardial infarction in Stockholm. In E. K. E. Gunderson & R. H. Rahe (Eds.), Life stress and illness. Springfield, Illinois: Charles C. Thomas.

Thomas, C. B., & Murphy, E. A. (1958). Further studies on cholesterol levels in the Johns Hopkins medical students: The effects of stress at examination. Journal of Chronic Diseases, 8, 661-670.

Thomas, P. D., & Hooper, E. M. (1983). Healthy elderly: Social bonds and locus of control. Research in Nursing and Health, 6, 11-16.

Thomas, S. P. (1983). The relationship between selected psychological, environmental, and behavioral variables and health status of Americans in middle adulthood. Unpublished doctoral dissertation, University of Tennessee, Knoxville.

Thomas, S. P., Williams, R. L., & Olsen, D. (1982, March). The development of a naturalistic self-management inventory. Paper presented at the meeting of the American Educational Research Association, New York.

Travis, J. W. Wellness workbook for health professionals. Mill Valley, CA: Wellness Resource Center.

van Doornen, L. J. P., & Orlebeke, K. F. (1982). Stress, personality and serum cholesterol level. Journal of Human Stress, 8, 24-29.

Wagner. E. H. (1982). An assessment of health hazard/ health risk appraisal. American Journal of Public Health, 72, 347-351.

Waldron, I. (1978). Sex differences in the coronary-prone behavior pattern. In T. M. Dembroski, S. M. Weiss, J. L. Shields, S. G. Haynes, & M. Feinleib (Eds.), Coronary-prone behavior (pp. 199-205). New York: Springer-Verlag.

Waldron, I., Zyzanski, S. J., Shekelle, R. B., Jenkins, C. D., & Tannenbaum, S. I. (1977). The coronary-prone behavior pattern in employed men and women. Journal of Human Stress, 3(4), 2-18.

Walker, S. N., Sechrist, K. R., & Pender, N. J. (1987). The health-promoting lifestyle profile: Development and psychometric characteristics. Nursing Research, 36, 76-81.

Wallston, B. S., & Wallston, K. A. (1978). Locus of control and health: A review of the literature. Health Education Monographs, 6, 107-117.

Watson, D. L., & Tharp, R. G. (1985). Self-directed behavior: Self-modification for personal adjustment (4th ed.). Monterey, CA: Brooks/Cole.

Weinberger, M., Hiner, S. L., & Tierney, W. M. (1987). In support of hassles as a measure of stress in predicting health outcomes. Journal of Behavioral Medicine, 10, 19-31.

Wennerholm, M. A., & Zarle, T. H. (1976). Internal-external control, defensiveness and anxiety in hypertensive patients. Journal of Clinical Psychology, 32, 644-648.

Williams, R. B., Haney, T. L., Lee, K. L., Kong, Y. H., Blumenthal, J. A., & Whalen, R. E. (1980). Type A behavior, hostility, and coronary atherosclerosis. Psychosomatic Medicine, 42, 539-549.

Williams, R. L., Jozwiak, J. S., Hector, M. A., & Young, D. (1985, March). Naturalistic assessment of health related life style. Poster session presented at the annual meeting of The Society of Behavioral Medicine, New Orleans.

Williams, R. L., & Long, J. D. (1983). Toward a self-managed life style (3rd ed.). Boston: Houghton Mifflin Company.

Wright, I. S. (1976). Correct levels of serum cholesterol: Average vs normal vs optimal. Journal of the American Medical Association, 236, 261-262.

Young, D. O. (1985). Psychometric examination of an adult self-report self-management inventory. Unpublished doctoral dissertation, University of Tennessee, Knoxville.

Ziesat, H. A. Jr. (1981). Behavioral approaches to the treatment of chronic pain. In C. K. Prokop & L. A. Bradley (Eds.), Medical psychology: Contributions to behavioral medicine (pp. 292-305). New York: Academic Press.

Zyzanski, S. J., & Jenkins, C. D. (1970). Basic dimensions within the coronary-prone behavior pattern. Journal of Chronic Diseases, 22, 781-795.

APPENDIXES

APPENDIX A

TENNESSEE SELF-DESCRIPTION FORM

SELF-DESCRIPTION FORM A

This form lists many different personal and professional behaviors of adults. Using the following key, CIRCLE the ONE number that most closely describes how often you do each behavior. There are no right or wrong answers.

	HOW OFTEN DO YOU DO THESE BEHAVIORS?					Do not write in this column
	Never	Few times a year	Few times a month	Several times a week	Several times a day	____(1-4)
1. Drinking coffee	0	1	2	3	4	____(5)
2. Putting away work materials	0	1	2	3	4	____(6)
3. Rambling in conversation	0	1	2	3	4	____(7)
4. Flossing my teeth	0	1	2	3	4	____(8)
5. Creating art objects	0	1	2	3	4	____(9)
6. Over-extending myself in work commitments	0	1	2	3	4	____(10)
7. Keeping my word	0	1	2	3	4	____(11)
8. Using hard drugs	0	1	2	3	4	____(12)
9. Attending art and cultural exhibits	0	1	2	3	4	____(13)
10. Donating to worthy causes	0	1	2	3	4	____(14)
11. Reaching work goals	0	1	2	3	4	____(15)
12. Criticizing others behind their back	0	1	2	3	4	____(16)
13. Getting adequate rest at night	0	1	2	3	4	____(17)
14. Playing a musical instrument	0	1	2	3	4	____(18)
15. Aiding stranded motorists on the interstate	0	1	2	3	4	____(19)
16. Jumping from one task to another	0	1	2	3	4	____(20)
17. Starting a conversation	0	1	2	3	4	____(21)
18. Eating excessively	0	1	2	3	4	____(22)
19. Attending concerts	0	1	2	3	4	____(23)
20. Completing work assignments on time	0	1	2	3	4	____(24)
21. Interrupting others during conversation	0	1	2	3	4	____(25)
22. Participating in vigorous physical activity	0	1	2	3	4	____(26)

	HOW OFTEN DO YOU DO THESE BEHAVIORS?					
	Never	Few times a year	Few times a month	Several times a week	Several times a day	Do not write in this column
23. Writing creatively (e.g., poetry, short stories)	0	1	2	3	4	___(27)
24. Eating only nutritious food	0	1	2	3	4	___(28)
25. Putting off unpleasant, but necessary, tasks	0	1	2	3	4	___(29)
26. Listening closely to others' comments	0	1	2	3	4	___(30)
27. Smoking cigarettes	0	1	2	3	4	___(31)
28. Reading leisurely (e.g., poems, fiction, magazines)	0	1	2	3	4	___(32)
29. Helping anyone asking for help	0	1	2	3	4	___(33)
30. Setting work goals	0	1	2	3	4	___(34)
31. Dominating conversation	0	1	2	3	4	___(35)
32. Drinking water	0	1	2	3	4	___(36)
33. Gardening/working in the yard	0	1	2	3	4	___(37)
34. Losing work related materials	0	1	2	3	4	___(38)
35. Encouraging others	0	1	2	3	4	___(39)
36. Eating junk food	0	1	2	3	4	___(40)
37. Engaging in outdoor nature activities	0	1	2	3	4	___(41)
38. Doing more than two types of exercise	0	1	2	3	4	___(42)
39. Reading course/professionally related materials	0	1	2	3	4	___(43)
40. Reprimanding/scolding others	0	1	2	3	4	___(44)
41. Doing stretching exercises	0	1	2	3	4	___(45)
42. Engaging in a hobby not listed in this form	0	1	2	3	4	___(46)
43. Stopping a mugging	0	1	2	3	4	___(47)
44. Failing to meet deadlines	0	1	2	3	4	___(48)
45. Showing affection toward others	0	1	2	3	4	___(49)
46. Gulping meals	0	1	2	3	4	___(50)
47. Dancing	0	1	2	3	4	___(51)

APPENDIX B

ROTTER'S LOCUS OF CONTROL QUESTIONNAIRE

ROTTER'S INTERNAL-EXTERNAL
LOCUS OF CONTROL SCALE

For each of the following twenty-nine items, please circle the one response (a or b) of each pair of responses that best reflects your opinion.

1. a. Children get into trouble because their parents punish them too much.
   b. The trouble with most children nowadays is that their parents are too easy with them.

2. a. Many of the unhappy things in people's lives are partly due to bad luck.
   b. People's misfortunes result from the mistakes they make.

3. a. One of the major reasons why we have wars is because people don't take enough interest in politics.
   b. There will always be wars, no matter how hard people try to prevent them.

4. a. In the long run people get the respect they deserve in this world.
   b. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.

5. a. The idea that teachers are unfair to students is nonsense.
   b. Most students don't realize the extent to which their grades are influenced by accidental happenings.

6. a. Without the right breaks one cannot be an effective leader.
   b. Capable people who fail to become leaders have not taken advantage of their opportunities.

7. a. No matter how hard you try some people just don't like you.
   b. People who can't get others to like them don't understand how to get along with others.

8. a. Heredity plays the major role in determining one's personality.
   b. It is one's experiences in life which determine what one is like.

9. a. I have often found that what is going to happen will happen.
   b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.

10. a. In the case of the well prepared student there is rarely if ever such a thing as an unfair test.
    b. Many times exam questions tend to be so unrelated to course work that studying is really useless.

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

12. a. The average citizen can have an influence in government decisions.
    b. This world is run by the few people in power, and there is not much the little guy can do about it.

13. a. When I make plans, I am almost certain that I can make them work.
    b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.

14. a. There are certain people who are just no good.
    b. There is some good in everybody.

15. a. In my case getting what I want has little or nothing to do with luck.
    b. Many times we might just as well decide what to do by flipping a coin.

16. a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
    b. Getting people to do the right thing depends upon ability, luck has little or nothing to do with it.

17. a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control.
    b. By taking an active part in political and social affairs the people can control world events.

18. a. Most people don't realize the extent to which their lives are controlled by accidental happenings.
    b. There really is no such thing as "luck".

19. a. One should always be willing to admit mistakes.
    b. It is usually best to cover up one's mistakes.

20. a. It is hard to know whether or not a person really likes you.
    b. How many friends you have depends on how nice a person you are.

21. a. In the long run the bad things that happen to us are balanced by the good ones.
    b. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.

22. a. With enough effort we can wipe out political corruption.
    b. It is difficult for people to have much control over the things politicians do in office.

23. a. Sometimes I can't understand how teachers arrive at the grades they give.
    b. There is a direct connection between how hard I study and the grades I get.

24. a. A good leader expects people to decide for themselves what they should do.
    b. A good leader makes it clear to everybody what their jobs are.

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

26. a. People are lonely because they don't try to be friendly.
    b. There's not much use in trying too hard to please people, if they like you, they like you.

27. a. There is too much emphasis on athletics in high school.
    b. Team sports are an excellent way to build character.

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

29. a. Most of the time I can't understand why politicians behave the way they do.
    b. In the long run the people are responsible for bad government on a national as well as on a local level.

APPENDIX C

UNIVERSITY STAFF DEMOGRAPHIC QUESTIONNAIRE

DEMOGRAPHIC QUESTIONNAIRE

Please enter the information requested in the spaces provided.

1. Year of birth: 19____

2. Last grade completed:_____

3. Height: _____feet _____inches

4. Weight: _____pounds

5. Body frame: _____small _____medium _____large

6. Sex: _____male _____female

7. Marital status: _____married _____single
_____widowed _____divorced or separated

8. Occupation: _____administration _____clerical _____faculty
_____food service _____maintenance _____other(specify)

9. After Operation Health Check, did you see a doctor for a follow-up exam?
_____yes _____no

10. Check all of the following that Operation Health Check staff suggested you do:
_____get more exercise _____stop smoking
_____lose weight _____reduce stress at work
_____improve diet _____reduce stress at home

11. What changes have you made as a result of Operation Health Check?
_____increased exercise _____stopped smoking
_____lost weight _____reduced stress at work
_____improved diet _____reduced stress at home

12. How familiar were you with the Jenkins Activity Survey before completing it this time?
_____not at all _____slightly _____moderately _____highly

13. Would you like to receive a report of what your questionnaires indicate about your health?
_____yes _____no

14. How would you like to be contacted?
_____campus telephone number_____
_____home telephone number_____
_____campus mail

Thank you for participating in this project. Please return your questionnaires by campus mail to Dr. Robert Williams at 108 Claxton Education Building.

APPENDIX D

NURSING STUDENT DEMOGRAPHIC QUESTIONNAIRE

DEMOGRAPHIC QUESTIONNAIRE

Please enter the information requested in the spaces provided.

1. Year of birth: 19____

2. Sex: ____Female ____Male

3. Race: ____Black ____White ____Am. Indian
____Oriental ____Hispanic

4. Marital status: ____Single ____Married
____Widowed ____Divorced or Separated

5. Number of children: ____

6. Height: _____Feet _____Inches

7. Weight: _____Pounds

8. Body frame: ____Small ____Medium ____Large

9. Blood pressure: _____

10. Which health problems have your blood relatives developed?

____Heart disease ____Diabetes ____Kidney disease
____Hypertension ____Cancer ____Gastrointestinal disease
____Obesity ____Arthritis ____Asthma

11. Which health problems have you developed?

____Heart disease ____Diabetes ____Kidney disease
____Hypertension ____Cancer ____Gastrointestinal disease
____Obesity ____Arthritis ____Asthma

12. In a typical week, what do you do and how much time do you spend in leisure or recreational activities?

Activity _____ Time spent _____

13. Are you satisfied with your current level of leisure activity?

_____Yes _____No

14. What are your current living arrangements?

_____Live alone

_____Live with spouse

_____Live with a nursing student

_____Live with a nonnursing student

_____Live with a nonstudent who is a nurse

_____Live with a nonstudent who is not a nurse

_____Other (specify)

15. During nursing school, who or what was your greatest source of emotional support?

_____

16. During nursing school, what has been your greatest source of stress?

_____

17. On a scale of 1 to 10, with 10 being most stressful, how would you rate your response to question 16?

_____

1 2 3 4 5 6 7 8 9 10

18. Name and address of someone who will always know your whereabouts:

Name _____

Address _____

Thank you for participating in this project. If you have any questions, please contact John Jozwiak at (615) 687-4189.

APPENDIX E

REGISTERED NURSE DEMOGRAPHIC QUESTIONNAIRE

DEMOGRAPHIC QUESTIONNAIRE

Please enter the information requested in the spaces provided.

1. Year of birth: 19____

2. Sex: ____Female ____Male

3. Race: ____Black ____White
____Oriental ____Hispanic

4. Marital status: ____Single ____Married
____Widowed ____Divorced or Separated

5. Number of children: ____

6. Height: _____Feet _____Inches

7. Weight: _____Pounds

8. Body frame: ____Small ____Medium ____Large

9. Blood pressure: _____

10. Which health problems have your blood relatives developed?

____Heart disease ____Diabetes ____Kidney disease
____Hypertension ____Cancer ____Gastrointestinal disease
____Obesity ____Arthritis ____Asthma

11. Which health problems have you developed?

____Heart disease ____Diabetes ____Kidney disease
____Hypertension ____Cancer ____Gastrointestinal disease
____Obesity ____Arthritis ____Asthma

12. In a typical week, what do you do and how much time do you spend in leisure or recreational activities?

Activity _____ Time spent _____

---

13. Are you satisfied with your current level of leisure activity?

_____ Yes _____ No

---

14. Nursing education completed: (check all that apply)

_____ Associate _____ Baccalaureate

_____ Diploma _____ Masters'

---

15. Major nursing responsibility:

_____ Clinical _____ Administrative _____ Educational

---

16. Years of experience as a registered nurse:

_____ fewer than 1 _____ 1-2 _____ 3-5

_____ 6-10 _____ 11-15 _____ over 15

---

17. Practice setting:

_____ Hospital with fewer than 400 beds
_____ Hospital with 400 or more beds
_____ Community Mental Health Agency
_____ Public Health Agency
_____ Nurse practitioner clinic
_____ Physician's office
_____ College or university
_____ Other (specify)

---

18. Are you now or have you been involved in any workshops or educational programs designed to modify lifestyle related behavior, e.g. stop smoking clinic or weight reduction clinic?

_____ Yes _____ No

---

19. If yes, please indicate how long ago you participated in the program(s), describe it (them) briefly, and on a scale of 1 to 5 with 5 being most effective indicate how effective you felt the program(s) was/were.

How long ago Description Effectiveness

20. What are your current living arrangements?

_____Live alone

_____Live with spouse

_____Live with a nursing student

_____Live with a nonnursing student

_____Live with a nonstudent who is a nurse

_____Live with a nonstudent who is not a nurse

_____Other (specify)

21. During nursing school, who or what was your greatest source of emotional support?

_____

22. During nursing school, what has been your greatest source of stress?

_____

23. On a scale of 1 to 10, with 10 being most stressful, how would you rate your response to question 16?

_____

1 2 3 4 5 6 7 8 9 10

24. Name and address of someone who will always know your whereabouts:

Name _____

Address _____

Thank you for participating in this project. If you have any questions, please contact John Jozwiak at (615) 687-4189.

APPENDIX F

OPERATION HEALTH CHECK PERMISSION LETTER

OPERATION HEALTH
WBIR-TV Ch.10
FORT SANDERS REGIONAL MEDICAL CENTER
THE RED CROSS

November 16, 1983

Mr. John Jozwiak
University of Tennessee
College of Nursing
1200 Volunteer Blvd.
Knoxville, TN 37996-4110

Dear John:

I am very pleased that the University of Tennessee would like to use data obtained during Operation Health Check 83' for research. One of the primary goals of the National Health Screening Council for Volunteer Organizations is to improve the health of individuals. One way of accomplishing this goal is by using the information that we obtain at our health screenings. Therefore, as Project Director, I am granting you permission to use the data gathered on the University of Tennessee employees on May 6, 1983. I am granting this permission based on the information supplied by you on page one of your letter dated September 26, 1983, in which you stated that, "all participation would be strictly voluntary", and, "Confidentiality of all responses would be maintained in accordance with the guidelines established by the University's Committee on Research Participation."

I would like to request that when your final report is written you share a copy with this office, as I am sure the National Health Screening Council for Volunteer Organizations would be very interested in your findings. If you have any questions concerning the above, please do not hesitate to contact me.

Sincerely,

Christie S. Dowling
Project Director

CDlmb

APPENDIX G

UNIVERSITY STAFF COVER LETTER

THE UNIVERSITY OF TENNESSEE
KNOXVILLE 37996-3400
COLLEGE OF EDUCATION

DEPARTMENT OF
EDUCATIONAL AND COUNSELING PSYCHOLOGY

TELEPHONE
(615) 974-5131

Your participation in Operation Health Check last May indicated your interest in learning more about your current state of wellness. Therefore, we think you may be interested in this opportunity to learn more about how your lifestyle may affect your health. Our research project is a follow-up to some of the services you received during Operation Health Check.

Your participation is voluntary. If you decide to participate, you will be asked to fill out three questionnaires requiring a total of about 30 minutes to complete. The questionnaires contain items designed to provide information about some of your day-to-day behaviors. You will also be asked to provide some other information such as your sex and age. In addition to the questionnaire information, we would like your permission to use the results of the blood work analyses done during Operation Health Check. (Operation Health Check will provide us with the blood work information.) All information will be treated confidentially.

Your participation is very unlikely to result in any risks to you. In fact, we think that your participation will help you understand how your lifestyle may affect your health. All participants who would like an explanation of how their behaviors are related to their health will be provided that information in group or individual sessions.

You have the right to refuse to participate or to withdraw at any time without penalty. If you choose not to participate, please return the questionnaires through campus mail to Dr. Robert Williams. You may use the enclosed peel-off address label.

If you choose to complete the questionnaires, your completed questionnaires will indicate your consent to participate in the study. When you complete your questionnaires, please return them through campus mail to Dr. Robert Williams. You may use the enclosed peel-off address label.

If you have any questions, please feel free to contact either of the researchers listed below.

John S. Jozwiak
College of Nursing
1200 Volunteer Blvd.
The Univ. of TN 37996-4110
(615) 974-7614

Robert L. Williams
Dept. of Educational & Counseling Psychology
108 Claxton Education Building
The Univ. of TN, Knoxville 37996-3400
(615) 974-5131

APPENDIX H

NURSING STUDENT COVER LETTER

INFORMED CONSENT STATEMENT

Dear Student:

You are invited to participate in a research study designed to develop a comprehensive description of student nurses with respect to personal, professional, and lifestyle characteristics. Your participation will involve the completion of a series of questionnaires that measure certain behaviors, attitudes, and perceptions that are often referred to as lifestyle characteristics. These questionnaires will require a total of approximately two hours to complete. Measurement of height, weight, and blood pressure will be optional.

No negative effects are expected to result from your participation in the project. Although no positive effects are guaranteed, you will receive information about your lifestyle characteristics that potentially could have long-term health benefits. Additionally, your participation may provide information that would be of benefit to nurse educators and future student nurses.

All data will be kept confidential and stored in a locked filing cabinet in the researcher's home. Each questionnaire will be coded with an identification number. Only the researchers will be able to identify individual respondents. All data will be summarized for any presentations or publications that arise from the research.

Participation in this project is voluntary and your consent for participation may be withdrawn at any time prior to completion of the data analysis by giving written notice to either of the researchers listed below. If you do withdraw or choose not to participate, you will not incur any penalty.

If you have questions about your participation in the study, please feel free to contact either of the researchers listed below.

I have read and understand the above statements. I freely consent to participate in this project under the above conditions.

Signed _____

Date _____

John S. Jozwiak
261 Chicamauga Ave.
Knoxville, TN 37917
(615) 687-4189

Robert L. Williams
Dept. of Educational & Counseling Psychology
108 Claxton Education Building
The Univ. of TN, Knoxville 37996-3400
(615) 974-5131

APPENDIX I

REGISTERED NURSE COVER LETTER

The University of Tennessee, Knoxville
College of Nursing
1200 Volunteer Boulevard
Knoxville, Tennessee 37996-4110
Telephone (615) 974-4151

Dear Nurse:

You are invited to participate in a research study designed to develop a comprehensive description of registered nurses with respect to personal, professional, and lifestyle characteristics. Your participation will involve the completion of a series of questionnaires that measure certain behaviors, attitudes, and perceptions that are often referred to as lifestyle characteristics. These questionnaires will require a total of about two hours to complete. Measurement of height, weight, and blood pressure will be optional.

No negative effects are expected to result from your participation in the project. Although no positive effects are guaranteed, you can receive information about your lifestyle characteristics that potentially could have long-term health benefits.

All data will be kept confidential and stored in a locked filing cabinet in the researcher's office. Each questionnaire will be coded with an identification number. Only the researcher and his assistants will be able to identify individual respondents. All data will be summarized for any presentations or publications that arise from the research.

Participation in this project is voluntary and your consent for participation may be withdrawn at any time prior to completion of the data analysis by giving written notice to either the researcher listed below or the research assistant who contacted you. There is no penalty for withdrawal from the project.

If you have any questions about your participation in the study, please feel free to contact the researcher listed below.

I have read and understand the above statements. I freely consent to participate in this project under the above conditions. Please include your address only if you would like a report of what your responses indicate.

Signed _____

Date _____

Address _____

_____

John S. Jozwiak
974-7614

VITA

John Stephen Jozwiak was born in Dunkirk, New York, on March 25, 1945. He attended school in Dunkirk, graduating from Cardinal Mindszenty High School in June of 1962. He married Wilma Wohlwend on March 22, 1969. Their daughter, Mariesa, was born on April 20, 1971.

John received the Bachelor of Science degree in Nursing from The University of Tennessee, Knoxville, in June of 1975. He began working in a variety of medical and psychiatric settings from June 1975 through August of 1979 when he received the Master of Science degree in Nursing from The University of Tennessee, Knoxville. He has been a member of the College of Nursing faculty at The University of Tennessee, Knoxville since September of 1979.

In 1981, the author entered the doctoral program in Educational Psychology within the College of Education at The University of Tennessee, Knoxville. He received the Doctor of Philosophy degree in Education with an emphasis on research design and measurement in June 1988.