BEHAVIOR PATTERNS AND LOCUS OF CONTROL OF CARDIOVASCULAR PATIENTS

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DEDICATION

To my nieces

Lisa, Sheryl, Kathy, Kim, and Shamekea

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CHAPTER 1

INTRODUCTION

It is widely recognized that the leading cause of death in the United States today is cardiovascular diseases. Major cardiovascular diseases encompass high blood pressure, stroke, congenital defects, and coronary heart disease. Of these cardiovascular diseases, the leading killer is the myocardial infarction, a major complication of coronary heart disease.

The most perplexing health concern today is coronary heart disease. Research is being done on various aspects of this disease--the etiology, treatment, rehabilitation, and prevention. Much emphasis in the last 3 decades has been placed on the individual behavioral aspects of coronary heart disease.

In view of increasing evidence, some health professionals, including cardiologists, nurses, psychologists, and sociologists, believe there is a specific behavioral pattern associated with coronary artery disease. This behavior pattern has been designated as Type A behavior pattern. The individual that possesses this pattern of behavior is described as a person with a complex of time

urgency, competitiveness, impatience, aggressiveness, insecurity, and hostility. Individuals displaying this pattern are at higher risk of sustaining myocardial infarction (Rosenman, Brand, Jenkins, Friedman, Straus, & Wurm, 1975).

The converse behavior pattern has been designated as Type B behavior. These individuals have little or no sense of time urgency, competitiveness, impatience, or hostility and are low risk for developing coronary heart disease (Rosenman et al., 1975).

This study examined the locus of control of cardiovascular patients--Type A and B individuals. Locus of control refers to an individual's belief whether or not his actions will affect the outcomes of his behavior. Locus of control is a significant variable of learning. Since patient education is important in cardiac rehabilitation and prevention, the establishment of the locus of control of cardiac patients would be valuable in determining teaching strategies for cardiac patients and for individuals at high risk of developing coronary artery disease.

Problem of Study

The problem statements were: Is there a relationship between Type A and B behavior patterns and locus of control of cardiovascular patients? Is there a difference in the locus of control of Type A and B individuals?

Justification of Problem

Nurses have a vital role in health education. Health education is especially important in patient compliance and in preventive health care.

Cardiovascular diseases claim more American lives than all other causes combined (American Heart Association, Inc., 1980). According to the National Center for Health Statistics, myocardial infarction carried a mortality rate of 641,000 in 1978. An estimated 4,330,300 Americans had a history of coronary artery disease in 1978 (American Heart Association, 1980). The American Heart Association (1980) estimated that heart and blood vessel diseases will cost $46.2 billion in 1981. This cost included $6.2 billion for physician and nursing services, $3.1 billion for cost of medications, and $1 billion for lost output due to disability. There is no doubt of the seriousness of this

health problem in terms of morbidity, mortality, and cost effectiveness.

Several studies have shown that Type A behavior is associated with the occurrence of coronary artery disease (Blumenthal, Williams, Kong, Schanberg, & Thompson, 1978; Friedman & Rosenman, 1969; Haynes, Feinleib & Kannel, 1980; Jenkins, Rosenman, & Zyzanski, 1974; Rosenman et al., 1975). For example, Friedman and Rosenman initiated the Western Collaborative Group Study in 1960-1961 which revealed after 8-1/2 years of study and follow-up that men judged at the beginning of the study to be Pattern A had more than twice the rate of new coronary heart disease than men originally judged Pattern B behavior (Rosenman et al., 1975). The results also indicated that Type A subjects with coronary heart disease were five times more likely to have a second myocardial infarction than Type B subjects (Rosenman et al., 1975).

Because nurses have a major responsibility in the education of cardiovascular patients, both Type A and Type B individuals, teaching strategies of cardiovascular patients employed by nurses need to be current and have a strong scientific base. A question comes to

mind, then: What variables affect the learning of cardiovascular patients?

Rotter (1954) believed that learning is affected by an individual's expectancy of reinforcement. That is, how a person learns may be determined by the belief that his actions will produce a suitable or expected outcome (Rotter, 1966).

Several studies support Rotter's social learning theory and have indicated that there is a difference in the locus of control of individuals who learn by skill and those who learn by chance (Brissett & Nowicki, 1973; Phares, 1968). Internally controlled individuals learn by skill while externally controlled individuals learn by chance (Rotter, 1971). Persons who expect reinforcements to come from their own behavior have been designated as internals; while externals are those persons who expect reinforcement to be associated with outside forces such as fate, chance, or powerful others (Rotter, 1966).

Locus of control has been determined to be an important variable of learning. It is important, then, that the locus of control of cardiovascular patients be investigated. This knowledge may contribute greatly to cardiovascular treatment, rehabilitation, and prevention.

Conceptual Framework

The conceptual framework for this study was based on Friedman's and Rosenman's Type A behavior theory and Rotter's social learning theory. The Type A behavior theory was introduced in 1959, and the social learning theory was established in 1954.

Friedman and Rosenman (1974) proposed that a specific behavior pattern, designated Type A, is the primary cause of premature coronary heart disease. It is further stated that in the absence of Type A behavior pattern, coronary heart disease almost never occurs before the age of 70 years (Friedman & Rosenman, 1974). This theory is based on the assumption that the brain and its function have some effect or relevance to coronary heart disease (Friedman & Rosenman, 1974).

The basic concepts of the Type A behavior theory are Type A behavior, Type B behavior, and coronary heart disease. Type A behavior contains four subconcepts: (a) "hurry sickness" or time urgency, (b) "free-floating hostility," (c) the quest for numbers, and (d) the insecurity of status (Friedman & Rosenman, 1974). No one Type A individual manifests all of the traits contained in the Pattern A behavior and an individual

with Pattern B will show some of the A-like characteristics (Friedman & Rosenman, 1974).

Type A behavior is defined as

> an action-emotion complex that can be observed in any person who is aggressively involved in a chronic, incessant struggle to achieve more and more in less and less time, and if required to do so against the opposing effort of other things or other persons. (Friedman & Rosenman, 1974, p. 67)

Type B behavior pattern is the converse of Pattern A; it is characterized by relative absence of time urgency, aggression, and hostility (Friedman & Rosenman, 1959, 1974).

The most significant trait of the Type A individual is his sense of time urgency or "hurry sickness" (Friedman & Rosenman, 1974). The Type A person incessantly strives to accomplish too much or perform too many activities in the amount of time that has been allotted for such purposes (Friedman & Rosenman, 1974). It is this ceaseless striving that Friedman and Rosenman (1974) believed leads to early demise from coronary heart disease.

Another characteristics of the Type A individual is the obsession with numbers (Friedman & Rosenman, 1974). The number of events or objects, not the events

or objects themselves, is important to the Type A individual. The quest for numbers, Friedman and Rosenman (1974) believed, leads to the insecurity of status.

The Type A individuals associate the number of achievements to the value of their personalities or characters (Friedman & Rosenman, 1974). These achievements must be those that the Type A person perceives as capturing the respect and admiration of his peers and superiors, not necessarily his fellowman. However, Type A individuals do not care to be disliked (Friedman & Rosenman, 1974).

The key reason for Type A insecurity is that the Type A individuals have valued their innermost securities upon the pace of their achievements (Friedman & Rosenman, 1974). This pace depends upon the maximum number of achievements accomplished in the minimum amount of time (Friedman & Rosenman, 1974).

Another trait of Type A behavior pattern is aggression. Type A subjects' aggression evolves into a "free-floating hostility" (Friedman & Rosenman, 1974). Aggression and hostility are not easily detected in Type A individuals as they tend to keep these feelings and impulses deeply concealed (Friedman & Rosenman, 1974).

Perhaps the prime index of the presence of aggression or hostility in the Type A individual, Friedman and Rosenman (1974) asserted, is the tendency to constantly compete with and challenge other persons. In essence, it does not matter whether an individual is struggling against time or other persons, the effects upon the body are the same (Friedman & Rosenman, 1974).

There are varying degrees in the intensity of this behavior pattern (Friedman & Rosenman, 1974; Glass, 1977). Many people classified as having Type A behavior exhibit these characteristics in a lesser degree (Friedman & Rosenman, 1974). The moderately afflicted Type A subject may rarely portray much hostility, impatience, or be obessively involved in the quest for numbers (Friedman & Rosenman, 1974). Friedman (1979) pointed out that an individual is believed to have severe Type A behavior when both "hurry sickness" and "free-floating hostility" are present in extreme degrees.

The accumulation of Friedman and Rosenman's (1959, 1974) studies suggested that Type A behavior may elevate plasma cholesterol, triglycerides, norepinephrine, corticotrophin, and enhance the insulinogenic response to glucose and the clotting of blood. It was believed by

Friedman and Rosenman that these factors are associated with the advent of coronary artery disease.

Rotter's social learning theory proposes that a person's actions or behaviors are predicted on the basis of that individual's values, expectations, and psychological situations (Lefcourt, 1976). This theory as stated by Rotter (1954) is so named because the social learning theory emphasizes that the basic styles of behavior are learned in social situations and individual needs require the mediation of other persons for need-satisfaction. These learned behaviors are modifiable and change with experience (Rotter, 1954).

There are several postulates for the social learning theory. The first postulate states that to study personality, it is necessary to investigate the interaction of the individual and his meaningful environment (Rotter, 1954). Another postulate points out that an individual's experiences influence each other (Rotter, 1954). One other postulate of significance is that behavior is goal-directed (Rotter, 1954).

There are four basic concepts or variables of the social learning theory: behavior potential, expectancy, reinforcement value, and psychological situation. Rotter

(1954) related these concepts in a general formula for behavior

> the potential for a behavior to occur in any specific psychological situation is a function of the expectancy that the behavior will lead to a particular reinforcement in that situation and the value of that reinforcement. (p. 57)

Behavior potential refers to "the potentiality of any behavior's occurring in any given situation or situations as calculated in relation to any single reinforcement or set of reinforcements" (Rotter, 1954, p. 105). Behavior potential is a relative value as it can only be measured in terms of other alternatives or other behavior potentials.

Expectancy is defined as the probability believed by the individual that a particular reinforcement is a result of a specific behavior of the individual in a specific situation or situations (Rotter, 1954). Reinforcement strengthens an expectancy that a particular behavior will result in a reinforcement (Rotter, 1966, 1971). Rotter (1966) further stated that not only does specific expectancy affect reinforcement, but generalized expectancies affect reinforcement and even more so. The occurrence of one reinforcement affects the expectancy

for the occurrence of all the other reinforcements (Rotter, 1966).

Reinforcement value is described as the preference that an individual holds for a particular reinforcement to occur in the light of all possible alternatives being equal (Rotter, Chance, & Phares, 1972). Reinforcement value may not only be a function solely of the past but also is based upon relations or associations of current reinforcements. The reinforcement value is relative and dynamic; it may remain the same or increase in value. Reinforcement is further delineated as either internal reinforcement or external reinforcement. Internal reinforcement is the "person's experience, or perception, that an event has occurred which has some value for him" (Rotter et al., 1972, p. 17). This value may be perceived as positive or negative. The positivity or negativity is decided by effects of the frequency of behavior. External reinforcement refers to "occurrences of events or outcomes known to have predictable reinforcement value for a group or culture to which the person belongs" (Rotter et al., 1972, p. 17).

Psychological situation may be looked upon as the internal or external environment with which the individual interacts. Expectancies in each situation are determined

by cumulated experiences in various situations that the individual perceives as similar. Psychological situations influence expectancies and reinforcement values (Rotter, 1954).

Rotter (1954) used several basic formulas in attempting to predict behavior. The formula that predicts behavior potential in a variety of situations is as follows:

> The potentiality of behavior x's occurring in relation to the reinforcements a to n in situations 1 to n is a function of the expectancies of these reinforcements' occurring in these situations and values of these reinforcements. (Rotter, 1954, p. 109)

Rotter (1954) proposed another formula for more general prediction. This formula included three broader concepts: need potential, freedom of movement, and need value. These variables are referred to as psychological needs and have been related in the following formula:

> The potentiality of occurrence of a set of behaviors that lead to the satisfaction of some need (need potential) is a function of the expectancies that these behaviors will lead to these reinforcements (freedom of movement) and the strength or value of these reinforcements (need value). (Rotter, 1954, p. 110)

In essence, need potential is a function of freedom of movement and need value.

Need potential is a broader concept of behavior potential. The difference is that "need potential refers to groups of functionally related behaviors rather than single behaviors" (Rotter et al., 1972, p. 35). If a person perceives reinforcement as contingent upon his own behavior (internal control), then the occurrence of either a positive or negative reinforcement will strengthen or weaken the potential for that behavior to recur in the same or similar situations (Rotter et al., 1972). If the individual determines the reinforcement to be from outside forces (external control), then the specific behavior is less likely to be affected, either strengthened or weakened (Rotter, 1966).

Perceived control is defined as "a generalized expectancy for internal as opposed to external control of reinforcements" (Lefcourt, 1976, p. 27). This concept of perceived control is derived from specific expectancy behaviors or outcomes. The generalized expectancy of internal or external control of reinforcement entails a causal analysis of success and failure. If the outcome is believed to be causally related to one's own doing, there is an internal control; but if the outcome is believed to be the result of outside forces, there is an external control (Lefcourt, 1976).

In summary, the purpose of the learning theory is the prediction of behavior and the internal or external processes related to behavior. The focus of the theory is to determine when one behavior is chosen over another behavior in a specific situation or situations.

Part of this theory is the concept of locus of control. The perception held by the individual of the causal relationship of the outcome of his behaviors will determine externality or internality of the individual.

There are some similarities between the two theories, Type A behavior theory and the social learning theory. The theorists specified that the environment is a stimulus for behavior. Rotter declared that this environment must be meaningful. Friedman and Rosenman did not specify whether there is a need for a meaningful environment, but they did state that a stimulus from the environment will evoke the behavior of Type A pattern. Rotter called the stimulus from the environment a psychological situationwhile Friedman and Rosenman simply referred to a stimulus from the environment.

Rotter gave examples of psychological situations as school situations, employment situations, or girl friend situations. Friedman and Rosenman did point out that a stimulus (situation) must be present; however, they did

not specify what this stimulus or situation must be. For example, when they spoke of impatience, they did not say that impatience is a particular function of being in the employment situation or social situation. They did imply, however, that stress may be an important part of the environment for manifestation of this Type A behavior pattern.

Rotter stated that behavior potential is a function of both expectancy and reinforcement value as these two factors are held constant. Friedman and Rosenman predicted a behavior, but they did not delineate whether reinforcement value or expectancy play a role in the actual occurrence of this behavior. They have noticed, however, a particular disease being associated with this behavior--coronary heart disease. That is, cardiovascular disease is seen greater with Type A behavior than with Type B behavior.

Reinforcement value as applied in the social learning theory refers to a preference for one thing over another thing. Type A individuals prefer pleasing their superiors rather than fellowman. Can this reinforcement value of Type A behavior be related to the prediction of the locus of control of Type A individuals? If so, can locus of control be predicted when a given behavior

pattern and a given reinforcement value are present? These particular questions will not be addressed in this thesis, but are raised when the concepts of these theories are being investigated.

The behavior of Type A individuals as defined by Friedman and Rosenman may help to predict their locus of control. The focus of this study was to determine the locus of control of cardiovascular patients with Type A or Type B behavior patterns as evidenced by Friedman's and Rosenman's structured interview. How the Type A person perceives the cause of his outcomes, either contingent upon his own behavior or outside forces, will be related to his locus of control. For example, the Type A individual's perception of whether his actions will result in achievements respected by his superiors or whether these desired achievements are under the influence of others may determine his locus of control. Merely the fact that Type A individuals desire the respect of particular others does not indicate whether they are externally or internally controlled.

Assumptions

For the purpose of this study, the following assumptions were made.

1. Man and his environment are in constant interaction.

2. Each individual has a distinct and unique personality.

3. Personality has unity.

5. Personality traits exert generalized effects on behavior.

5. Behavior can be learned and observed.

Hypotheses

For the purpose of this study, the following hypotheses were tested.

1. There is no significant relationship between the locus of control scores and the Type A and B behavior pattern scores of cardiovascular patients.

2. There is no significant difference in the locus of control scores of Type A and B individuals with coronary heart disease.

Definition of Terms

The following terms were defined for use in the study.

1. Type A behavior pattern--

a characteristic action-emotion complex that can be observed in any person who is

> aggressively involved in a chronic, incessant struggle to achieve more and more in less and less time, and if required to do so, against the opposing efforts of other things or other persons. (Friedman & Rosenman, 1974, p. 67)

2. Type A individual (operational definition)--a person that scores 90 or greater on the structured interview for diagnostic indicators of Type A behavior.

3. Type B behavior pattern--"characterized by relative absence of drive, ambition, sense of time urgency, desire to compete, or involvement in deadlines" (Friedman & Rosenman, 1959, p. 1286).

4. Type B individual (operational definition)--a person that scores 70 or less on the structured interview for diagnostic indicators of Type A behavior.

5. External locus of control--"a perception that an individual holds that reinforcement is contingent not entirely upon his actions, but as the result of powerful others" (Rotter, 1966, p. 1). External locus of control is operationally defined as the higher the score on the Adult Nowicki-Strickland Locus of Control Scale, the more the individual is externally controlled.

6. Internal locus of control--"a perception that an individual holds that reinforcement is contingent upon his own behavior" (Rotter, 1966, p. 1). Internal locus of control is operationally defined as the lower the

score on the Adult Nowicki-Strickland Locus of Control Scale, the more the individual is internally controlled.

7. Coronary heart disease--a narrowing of the arteries to such an extent that they can no longer supply blood to the heart muscle to sufficiently nourish and oxygenate it, leading to its inability to meet the demands required of it (Friedman & Rosenman, 1974). Cardiovascular disease is operationally defined as a medical diagnosis of myocardial infarction or angina pectoris.

Limitations

The following limitations may have influenced the conclusions of this study.

1. The study was conducted in one geographic area.
2. The sample size was small.
3. The study lacked randomization in subject selection.
4. There may have been bias in the measurement and classification of subjects as Type A or B individuals.

Summary

The need for nurses to be knowledgeable about the basic concepts of this study (coronary-prone behavior and locus of control) is evident in terms of cardiovascular assessment and nursing interventions as they relate to

treatment, rehabilitation, and prevention of cardiovascular disease. The nurse's role in developing teaching plans for cardiovascular patients is vital in all levels of health care--primary, secondary, and teritary. The conceptual framework of this study that was based on Type A behavior theory and the social learning theory has shown the relationship between these concepts. If there is indeed a significant relationship between locus of control and behavior patterns of cardiovascular patients, health education of cardiovascular patients may be enhanced with not only the patient to benefit but also society in terms of cost effectiveness.

CHAPTER 2

REVIEW OF LITERATURE

Eminent cardiologists, psychologists, and sociologists have investigated the behavioral aspects of cardiovascular disease and how these behaviors may be modified in the mitigation of this number one killer. Few nurses, however, have examined these concepts. As nurses begin to investigate the behavioral aspects of cardiovascular diseases, the need to apply these concepts to the domain of nursing leads to the investigation of (a) how these behaviors can be effectively and efficiently assessed in the clinical setting; (b) how these behaviors can be altered; and (c) how patients with these behavior patterns can be best taught about the cardiovascular process, treatment, rehabilitation, and prevention. These concepts will be discussed in the literature review as well as how the learning variable, locus of control, is related to the behavior patterns of cardiovascular patients.

Association between Type A Behavior Pattern and Coronary Heart Disease

As early as the 1950s, cardiologists began recognizing Type A behavior pattern as a risk factor for coronary heart disease. Although greatly criticized and challenged, today the effect of Type A behavior in coronary heart disease prevalence, incidence, and recurrence is widely accepted by many health professionals.

While studying the relationship between cholesterol and coronary heart disease, Friedman and Rosenman (1974) realized that other factors beyond cholesterol contributed to coronary heart disease. At that time, they began to consider the possibility of personality playing a role in the pathogenesis of coronary heart disease.

In an exploratory study, Friedman and Rosenman (1974) sent out questionnaires to 150 businessmen in San Francisco, asking these persons to indicate which factors they believed had contributed to the heart attacks of their friends. These questionnaires consisted of 10 items designating a particular behavior pattern or complex of habits.

Seventy percent of these men believed that competitiveness and meeting deadlines were the prominent

characteristics of their friends who had sustained myocardial infarctions. From these findings, Friedman and Rosenman (1974) determined that there probably existed a specific behavior pattern associated with coronary heart disease. Friedman and Rosenman combined these findings with other clinical observations of their patients to compile a set of behaviors they designated as Type A behavior pattern.

Friedman and Rosenman (1958, 1959), investigated the association between serum cholesterol levels, blood clotting time, and presence of clinical coronary heart disease in three groups of men with different overt behavior patterns. The men in group A exhibited a behavior pattern indicating intense ambition, competitiveness, sense of time urgency, and obsession with deadlines. The men in group B displayed the converse of group A men while the men in group C who were all blind and unemployed demonstrated a behavior pattern of anxiety. The sample consisted of 200 men: 83 in group A, 83 in group B, and 36 in group C. The presence of clinical coronary heart disease, the serum cholesterol levels, blood clotting times, and an assay of dietary and exercise habits were obtained. The total caloric and fat intake were approximately the same for the men

in each group. However, group A had significantly higher serum cholesterol levels than group B or group C. The clotting time was the fastest in group A. The incidence of clinical coronary disease occurred approximately eight times greater in group A than group B and approximately six times greater in group A than group C. These findings suggested that a specific behavior pattern may be related to an elevated blood cholesterol level, increased blood clotting time, and prevalence of coronary heart disease (Friedman & Rosenman, 1959).

Continuing, Friedman, Rosenman, and Brown (1963) in searching for a relationship between heart rate and behavior patterns, found that the average serum cholesterol was significantly higher in individuals who were judged Type A than those who were considered as Type B. They found that the heart rates of both groups, Type A and B, were essentially the same. Only a small sample of 10 Type A subjects and 11 Type B subjects was tested (Friedman et al., 1963).

In yet another study, Rosenman and Friedman (1963) found again that individuals with Type A behavior pattern had significantly higher serum cholesterol triglycerides and phosolipids levels. The sample

consisted of 10 Type A and 10 Type B subjects who were selected from a group of men who had been determined to be either Type A or Type B by laymen and by Friedman and Rosenman. Other criteria for selection included (a) each Type A subject would occupy a job demanding extreme competition and meeting of habitual deadlines, while each Type B subject would have jobs that lack competitiveness and preoccupation with deadlines and (b) each Type A subject would admit to having time urgency and competitiveness and preoccupation with deadlines while Type B would declare that their jobs lacked time urgency and competitiveness. Again, the sample size was small (Rosenman & Friedman, 1963).

Meanwhile, others were conducting research studies which supported the findings of Friedman and Rosenman. For example, Hammersten, Cathey, Remond, and Wolf (1957) investigated the relationship between serum cholesterol, diet, and stress in patients with coronary artery disease. They found that stressful events were related to 19 of 20 occasions where high serum cholesterol levels were present. This conclusion supported previous findings.

However, this theory of Type A behavior continued to receive much criticism. The samples were too small;

only one geographic area was sampled; and only retrospective studies had been done.

Therefore, a large prospective study, the Western Collaborative Group Study, was launched in 1960 using a sample of 3,524 subjects who were at risk for developing coronary heart disease (Rosenman, Friedman, Straus, Wurm, Kositchek, Hahn, & Werthessen, 1964). This sample was obtained from 11 business organizations in the San Francisco-Oakland Bay area and the Los Angeles area. Of the 3,524 subjects, 113 persons already manifested evidence of coronary heart disease while the remaining 3,411 men were free of coronary heart disease. Two methods were used to predict the occurrence of coronary heart disease--the serum lipoprotein levels and a taped-recorded personal interview with a psychological test. All data were collected independently and blindly. The judgment of the presence or absence of coronary heart disease was done by a physician who was independent of the study; his findings were not known until all other data had been collected (Rosenman et al., 1964).

The researchers found coronary-proneness was ascribed to 31.5% of subjects without coronary heart disease by the lipoprotein method and 52% by the Type A behavior assessment method (Rosenman et al., 1964). In

the 113 subjects with existing clinical coronary heart disease, 45.1% were classified as coronary-prone and 54.9% were categorized as noncoronary prone using the lipoprotein method. Using the behavior assessment method, 70.9% of the men with coronary heart disease already present were judged to possess Type A behavior pattern and 29.1%, Type B behavior pattern. In the 3,411 men without coronary heart disease, 31.5% were determined coronary-prone and 68.5% noncoronary prone by the lipoprotein method. Using the behavior assessment method, 52% were considered Type A (coronary-prone), and 48% were Type B (noncoronary prone). There were no differences in blood coagulation determinations. These were the preliminary findings. Prospective gathering of the data from subjects who were initially free of coronary heart disease would follow (Rosenman et al., 1964).

After 2 years had elapsed, a follow-up study was done to determine what characteristics of the original men free of coronary heart disease were important in predicting the occurrence of coronary heart disease (Rosenman, Friedman, Straus, Wurm, Jenkins, & Messinger, 1966).

All men who were over 59 years of age and were under 39 years of age were excluded from the follow-up

study. Also excluded from the study were 106 employees from one of the participating business organizations who had withdrawn from the study and 45 subjects who were lost because of noncardiac death or relocation to some other area in the country. The same methodology was employed in the collection of data as in the 1964 study (Rosenman et al., 1964).

Seventy of the 3,182 subjects in the 1964 study had experienced the advent of coronary heart disease. Fifty-two of these men had sustained myocardial infarctions, and 18 men had been diagnosed as having angina pectoris. Of the 52 men who had suffered myocardial infarctions, 26 of them had succumbed to death. Of the 70 subjects with new onset coronary heart disease, 85% of the younger men (39-49 years old) and 72% of the older men (50-59 years old) demonstrated the Type A behavior pattern as determined by the behavior assessment method. The younger group with Type A behavior incurred six times more coronary heart disease than counterparts with Type B behavior. For both age decades, the subjects exhibiting high lipoprotein ratios had 17 times greater incidence of new onset coronary heart disease than the group having lower lipoprotein ratios. The men with hypercholesteremia had 2.2 times greater

incidence of new onset coronary heart disease than the men with lower serum cholesterol levels. The men with elevated blood pressures had 3.6 times greater incidence of new onset coronary heart disease than the normotensive subjects. The men with familial history of coronary heart disease had 2.4 times greater incidence of new onset coronary heart disease than the subjects without parental history of coronary heart disease. There were no differences in the mean values of blood coagulation tests in the subjects with new onset coronary heart disease as well as the other subjects who were at risk for coronary heart disease (Rosenman et al., 1966).

This study further delineated behavior assessment of Type A and B subjects with the presence of hypertensive and elevated lipoprotein ratios (Rosenman et al., 1966). The incidence of coronary heart disease in Type A subjects with hypertension in either the first or second age groups was two times greater than in the normotensive Type A subjects. The incidence of hypertensive Type B subjects was no greater than that occurring in the normotensive Type B subjects in the younger age group and marginally higher in the older age group. In either age group, no greater incidence of coronary heart disease occurred in Type B subjects with

hypertension than normotensive Type A subjects. The younger group of Type A subjects with elevated lipoprotein ratios had no greater incidence of coronary heart disease than the younger Type A subjects with lower lipoprotein ratios. However, the younger Type A subjects with higher lipoprotein ratios had higher incidences of coronary heart disease than the younger Type B subjects with the higher lipoprotein ratios. The older Type A subjects with elevated lipoprotein ratios had a greater incidence of coronary heart disease than the older Type B subjects with elevated lipoprotein ratios. However, the Type B subjects with elevated lipoprotein ratios had no greater incidence of coronary heart disease than the total group of subjects at risk for coronary heart disease (Rosenman et al., 1966).

In conclusion, then, this prospective study suggested that coronary heart disease probably results from the interaction of many factors, such as hypertension, hypercholestermia, elevated lipoprotein ratio, and parental history of coronary heart disease. But much more impressive, these results indicated that the presence or absence of a particular overt behavior pattern, Type A behavior pattern beyond the traditional

risk factors, was valuable in predicting the occurrence of new onset coronary heart disease (Rosenman et al., 1966).

After 4-1/2 years had passed, Rosenman, Friedman, Straus, Jenkins, Zyzanski, and Wurm (1970) again examined the relationship of risk factors to the emergence of new onset coronary heart disease. The same methodology utilized in the beginning of the Western Colloborative Group Study was employed in this follow-up study.

Subjects who developed subsequent coronary heart disease were compared to the men who remained free of coronary heart disease. Clinical coronary heart disease occurred in 133 subjects who were initially well men during this 4-1/2-year follow-up. Therefore, 9.3 per 1,000 men at risk developed coronary heart disease per year. In the younger age group (39-49 years), the annual incidence was 6.2 per 1,000 and 16.8 per 1,000 in the older age group. The men who reported a regular exercise regimen and the men who reported moderate to heavy work activity had lower incidence of coronary heart disease than did the men who had sedentary to light occupational activity and none to occasional avocational related exercise. The subjects with parental

history of coronary heart disease and history of hypertension or diabetes had higher incidence of coronary heart disease. Smoking was related to enhanced rate of coronary heart disease for both age groups, but was found more significant in the younger age group. Higher rates of coronary heart disease were found in men who were former smokers than in the men who had never smoked. Also higher coronary heart disease rates were observed in the heavier smokers than the lighter smokers. The incidence of coronary heart disease was significantly related to the systolic and diastolic blood pressures and the serum levels of cholesterol, triglycerides, lipoalbumin, beta lipoprotein, and beta/alpha lipoprotein ratios.

The subjects who were classified as Type A behavior pattern had higher coronary heart disease rates than the subjects with Type B behavior pattern. Again, the structured interview method was used to determine the behavior patterns. Acute myocardial infarctions occurred in 104 of the subjects and angina pectoris in the other 29 men. The incidence of angina pectoris was significantly related to parental history of coronary heart disease, elevated serum cholesterol, and the Type A behavior pattern but not to the blood pressures, serum triglycerides, and beta/alpha lipoprotein ratios.

The investigators attributed this difference to be influenced by the relatively small numbers of subjects in each clinical subgroup (Rosenman et al., 1970).

The association of Type A behavior pattern to coronary heart disease was examined by means of bivarate analyses to provide information as to whether the behavior pattern had independent or interactive contribution to the risk of coronary heart disease. Parental history of coronary heart disease and Type A behavior were strongly and independently related to the risk of coronary heart disease in both age groups. When Type A was bivaried with diastolic blood pressure, again strong and independent relationships to coronary heart disease were found in both age groups. The serum cholesterol level and Type A behavior pattern were also strongly and independently related to coronary heart disease rate. This relationship was stronger in the younger decade than in the older decade, but both were significant risk factors for both age groups. When stratified with triglycerides and beta/alpha lipoprotein ratio, Type A behavior pattern was the significant predictor. However, each of these lipids were also strong and independent predictors of coronary heart

disease when behavior pattern was controlled (Rosenman et al., 1970).

The investigators (Rosenman et al., 1970) studied yet another hypothesis: the behavior pattern would be a strong and independent predictor of coronary heart disease when a broad series of risk predictors were controlled simultaneously. The multiple regression procedure was employed in the testing of this hypothesis. Coronary heart disease rate was enhanced by the combined risk factors. When these variables were removed, the influence of the coronary-prone behavior pattern remained significant in the 30-49-year-old age group. The Type A men had over twice the risk for coronary heart disease than the Type B men when serum lipids, blood pressure, cholesterol, smoking, obesity, and the other variables were held constant. In the older group, the coronary heart disease rates were 18.7 per 1,000 for Type A men and 13.2 per 1,000 for Type B men. The Type A and B variables were not statistically significant for the older age group when all the other variables were controlled simultaneously. The behavior pattern as a coronary heart disease risk factor was stronger in the younger men as compared to the older men, thus supporting the findings obtained in the two previous

studies (Rosenman et al., 1964, 1966). This study showed a significant association between Type A behavior pattern and an increase in coronary heart disease, independent of other traditional risk factors.

The final follow-up study of the Western Collaborative Group after 8-1/2 years was completed in 1969 (Rosenman, Brand, Jenkins, Friedman, Straus, & Wurm, 1975). The investigators continued to employ the same methodology as reported in their previous studies. There were 3,154 subjects at the beginning who were at risk for initial occurrence of coronary heart disease, 2,249 of whom were 39-40 years of age, and 905 who were 50-59 years of age. Manifest coronary heart occurred in 257 subjects while 2,391 subjects remained free of coronary heart disease (Rosenman et al., 1975). Of the 257 subjects with new onset coronary heart disease, death occurred in 140 subjects, 50 of initial coronary heart disease insult and 90 of noncoronary heart disease causes. Of the 3,154 subjects, 1,589 were assessed as having Type A behavior pattern, and 1,565 were assessed as having Type B behavior pattern. Death from coronary heart disease occurred in 34 Type As and 16 Type Bs and from other causes in 51 Type As and 39 Type Bs, including 5 Type A and 2 Type B subjects with new onset

coronary heart disease. The death rate per 1,000 persons per year from coronary heart disease causes was 2.92 for Type A subjects and 1.32 for Type B subjects. The subjects without clinical coronary heart disease were 1,129 Type A subjects and 1,262 Type B subjects. There was a total of 506 subjects lost from the beginning to the final follow-up. They were considered to be noncoronary heart disease cases and included 282 Type As and 224 Type Bs. There was a slightly greater loss to follow-up of Type A men than that of Type B men (Rosenman et al., 1975).

In the younger age group, Type A behavior was significantly associated with symptomatic and silent myocardial infarctions. The incidence of angina pectoris was two times greater in Type A than in Type B subjects, but was not considered statistically significant because of the small number of subjects in that category (Rosenman et al., 1975).

In the older age group, Type A subjects had significantly more symptomatic infarction and angina pectoris clinically than the Type B subjects. But statistically, this 2% difference was not considered significant (Rosenman et al., 1975).

When Type A behavior was stratified with the other predictive risk factors, Type A subjects continued to have a higher incidence of coronary heart disease. The Mantel-Henszel procedure was used to analyze the combination effects of risk factors and Type A behavior in predicting the occurrence of coronary heart disease. It was found that the increase in the rate of coronary heart disease as observed with the Type A subjects was not associated with the higher occurrence of the other risk factors. In the younger age group, the association between behavior pattern and coronary heart disease incidence was 2.21 (odds ratio, $p < .0001$) before adjustment for the other risk factors and 1.87 ($p < .003$) after adjustment for the other risk factors. In the older group, the ratio was 2.31 ($p < .002$) before adjustment of the other risk factors and 1.98 ($p < .019$) after the adjustment (Rosenman et al., 1975). Thus these findings indicated that the predictive relationship of Type A behavior pattern to coronary heart disease could not be explained by the traditional risk factors; these findings supported the Rosenman et al. (1966) study.

In concluson, this prospective study of the Western Collaborative Group Study of 8-1/2 years reaffirmed the

relationship between coronary heart disease and the classical risk factors of parental history of premature coronary heart disease, elevated systolic and diastolic blood pressure, cigarette smoking, and higher serum levels of cholesterol, triglycerides, and beta/ lipoproteins. This study also confirmed that the Type A behavior pattern had a pathogenic effect in the occurrence of coronary heart disease in addition to, as well as in combination with, the traditional risk factors (Rosenman et al., 1964, 1966, 1970, 1975).

The theory of Type A behavior pattern was becoming widely accepted throughout the country. Blumenthal, Williams, King, Schanberg, and Thompson (1978) conducted a study to investigate the association between the behavior pattern of Type A and the disease process of coronary atherosclerosis. Based on the previous findings of Friedman and Rosenman (1974), these investigators believed that if Type A behavior was indeed related to the onset of coronary heart disease, then Type A behavior was probably related to the disease process that leads to coronary heart disease--coronary atherosclerosis (Blumenthal et al., 1978).

Blumenthal et al. (1978) attempted to relate the behavior pattern of Type A to actual arterial lesions by

way of a coronary arteriography. This procedure was done by cardiac catheterization which is the passing of a flexible catheter along the veins or arteries into the heart in order to visualize the structure of the heart. One hundred fifty-six consecutive patients who had been referred to the Duke University Medical Center for coronary arteriography comprised the sample. The age range was from 15 to 69 years; the mean age was 47 years. Fourteen subjects were deleted from the study because they had been referred as a result of valvular diseases. Of the 142 patients remaining in the study, 80 were male and 62 were female.

The behavioral assessment was done by utilizing the structured interview technique on the morning after the catheterization before the catheterization results were known. One of the judges who rated the subjects as either having Type A or Type B characteristics had been trained in the technique of behavior pattern assessment at the Harold Brunn Institute in San Francisco. In addition to the structured interview method, the Jenkins Activity Survey Questionnaire was completed by each participant as another measure of behavior assessment. All data were collected independently of each other. Serum cholesterol level, history of cigarette smoking,

previous documented myocardial infarction, familial history of coronary heart disease, and history of hyperlipidema were obtained before the coronary angiography was done. Aortic blood pressure was measured during the heart catheterization.

Type A behavior patterns were found to be related to lipid metabolism and higher serum cholesterol levels--248 mg% for Type A subjects and 211 mg% for Type B subjects ($p < 0.01$). There were no statistically significant differences between Type A and Type B subjects in regard to history of cigarette smoking, blood pressure, and mean arotic pressure. Type A behavior when measured by the structured interview method was found to be related arteriographically with atherosclerosis but not when measured by the Jenkins Activity Survey Scale. Of the patients with mild coronary occulsions, 44% were classified as Type A. Sixty-nine percent of the patients with moderate lesions and 93% of the patients with severe coronary occulsions were classified as Type A ($p < 0.001$). This relationship between behavior pattern and coronary lesion as determined by angiography remained significant ($p < 0.003$) when age, sex, blood pressure, cholesterol, and history

of cigarette smoking were simultaneously covaried (Blumenthal et al., 1978).

In addition, this study found that the traditional risk factors for coronary heart disease were also related to coronary atherosclerosis as measured by coronary arteriography. The serum cholesterol level had a significant association to the severity of coronary disease. Blood pressure was not found to be related to coronary heart disease. An association between smoking and coronary heart disease was found. Cigarette smokers were found to have significantly greater incidence of moderate to severe coronary occulsions than the non-cigarette smokers (Blumenthal et al., 1978).

In conclusion then, this was the first study conducted that investigated and found an association between the Type A behavior pattern as measured by the structured interview method and the severity of atherosclerosis as determined by coronary arteriography. In addition, this study supported previous studies that linked the traditional risk factors with coronary heart disease. But more important, it supported the previous findings of Rosenman et al. (1975) that suggested Type A behavior was a significant risk factor in the occurrence of coronary heart disease (Blumenthal et al., 1978).

As the theory of Type A behavior pattern had begun receiving more popularity, several other scientists were forming hypotheses and testing them. For example, in the same year that Blumenthal et al. (1978) conducted their study, Frank, Heller, Kornfeld, Sporn, and Weiss (1978) engaged in another study to confirm the previous finding that there was a relationship between Type A behavior pattern and coronary artery disease. Coronary angiography was used to diagnose the severity of coronary artery disease--the number of arteries stenosed by 50% or greater. The standardized Rosenman-Friedman interview method was employed in assessing Type A behavior pattern. One hundred forty-seven consecutive patients who had been scheduled for coronary angiography at the Columbia Presbyterian Medical Center were studied. Of these patients, 124 were men and 23 were women. The average age of the sample was 51.7 years. Clinically, 83% of the patients had angina pectoris, 12% atypical angina, and 5% no chest pain. Review of the patient's chart revealed that 54% of the patients had experienced at least one myocardial infarction. The mean cholesterol level of the sample was 216 mg/dl, 27% had cholesterol levels higher than 275 mg/dl. Thirty-two percent of the sample were hypertensive. Seventy percent of the

sample smoked more than a half pack of cigarettes per day, and 30% smoked less than a half pack of cigarettes per day. Fifty-one percent were Type A1, 22% were A2, 20% were B3, and 5% were B4. The behavior ratings were done independently of angiographic findings (Frank et al., 1978).

Analyses of data were done using the product-moment correlation coefficient and multiple regression/correlation analysis. The findings revealed less disease in Type B subjects and a greater severity of disease in Type A subjects. The classical risk factors of hypertension, cholesterol, smoking, sex, and age were associated significantly with coronary artery disease. Cholesterol had the strongest correlation to the severity of coronary artery disease. History of previous myocardial infarction was correlated significantly with coronary artery disease severity. In the multiple regression analysis, it was found that the Type A score accounted for a significant proportion of disease variance, above and beyond the cumulative effects of the other risk factors. This study supported the previous findings of Rosenman et al. (1975) and Blumenthal et al. (1978).

On the contrary Dimsdale, Hackett, Hutter, Block, and Catanzano (1978) investigated the relationship between Type A personality and the extent of coronary artery disease and found no relationship between Type A behavior and the extent of coronary artery disease. These authors studied 109 patients in the Massachusetts area who underwent coronary arteriography. It was found that patients who possessed Type A behavior as assessed by the Jenkins Activity Survey Scale had no correlation with the extent of their coronary artery disease. Of the 109 patients studied, 99 were men and 10 were women. The average age was 49 years. Sixty-five percent had a history of myocardial infarction, and 55% had angina pectoris. Before the cardiac catheterization was done, patients completed the Jenkins Activity Survey Scale. The cardiac catheterization was done and interpreted without knowledge of the results of the questionnaire score. The patients with mild coronary heart disease had scored significantly higher on the Jenkins Activity Survey Scale (Dimsdale et al., 1978).

Thus, this study, while confirming one of the findings of Blumenthal et al. (1978), did not support other previous studies. Although Blumenthal et al. (1978) did find a correlation between Type A behavior

pattern and coronary atherosclerosis using the structured interview, the same correlation using the Jenkins Activity Survey was not found. Since Dimsdale et al. (1978) did not use both behavior assessment tools, it is difficult to determine if their results were related to the use of the Jenkins Activity Survey Scale or to some other factor. Dimsdale et al. (1978) attributed the difference to be partly related to the differences in the population in terms of ethnicity. They purported that ethnicity may effect the determination of Type A behavior.

A more recent study conducted by Orth-Gomer, Ahlbom, and Theorell (1980) examined the relationship between Type A behavior and ischemic heart disease while controlling for the conventional risk factors. One hundred fifty middle-aged men in Stockholm were studied. The men were divided into three groups--one with manifest ischemic heart disease, one with traditional risk factors for ischemic heart disease, and one healthy control group. Each group was comprised of 50 men. This sample was obtained from a population of 4,000 men, aged 40-65 years who were employed by three large companies in the Stockholm area. The group with manifest ischemic heart disease were selected from all men registered in the medical department of the company as having a myocardial

infarction or angina pectoris. Fifty-three men met this criteria, but two of the men declined to participate. Of the remaining 51 men, 32 had myocardial infarctions and 19 had angina pectoris. The diagnosis of myocardial infarction was confirmed by hospital records and enzyme or electrocardiogram changes. The diagnosis of angina pectoris was assessed by the London School of Hygiene Questionnaire and by a standardized exercise electrocardiogram. One other patient was dropped from the study as a result of a negative exercise test (Orth-Gomer et al., 1980).

The other two groups were acquired from the health screening records. Fifty men found to have one or more risk indicators and ischemic heart disease comprised the risk group. For the control group, 50 men free of ischemic heart disease but with known risk factors were selected. The men from both groups were matched individually according to age and occupational level (Ortho-Gomer et al., 1980).

The presence of Type A behavior pattern was assessed by means of the structured interview method. All interviews were done by one of the investigators who had been trained in the assessment of Type A behavior. This person was not aware of the health status of the subjects.

Blood pressures were measured in the supine position immediately after lying down and 15 minutes after rest and in a sitting position after the 15 minutes of rest. The mean blood pressure was calculated from these three measurements. Fasting blood samples were drawn from each subject to determine the cholesterol triglycerides, glucose, and uric acid levels. Height was recorded in centimeter and weight in kilograms. Past and present cigarette, cigar, and pipe smoking were determined (Orth-Gomer et al., 1980).

The ischemic heart disease group was compared to the control group, the risk group to the control group, and the ischemic heart disease group to risk groups by using the t-test to measure differences. The prevalence odds ratio was used to measure the impact of pattern A behavior on ischemic heart disease (Ortho-Gomer et al., 1980).

The group with manifest ischemic heart disease had significantly higher values than the control group on the variables of systolic blood pressure, serum cholesterol, serum triglycerides, serum uric acid, and relative weight. The risk for ischemic heart disease was four times greater with the presence of Type A behavior pattern than without Type A behavior pattern (Ortho-Gomer et al., 1980).

Thus this retrospective study supported previous findings. In addition, it has shown an association between Type A behavior as measured by the interview method and clinical ischemic heart disease in a Swedish culture (Orth-Gomer et al., 1980).

In summary, this review section has given support to the conceptual framework of the present study. The most prominent studies have been reported and have indeed shown an association between Type A behavior pattern and coronary heart disease. However, despite the widespread research that has been done in this area, no one has been able to delineate the exact role that Type A behavior pattern plays in enhancing the atherogenic process. Nurses have a vital role in investigating this area.

Assessment of Type A Behavior

Just as the theory of Type A behavior had received great criticism, so did the methods for assessment of Type A behavior, if not more so. The animadversion ranged from the lack of objectivity in judgment to the lack of necessity for measuring such a behavior. In response to a critical evaluation of the measurement of Type A behavior pattern, Rosenman, Friedman, Jenkins, and Bortner (1968) responded to the contention that their

instrument was biased and based on retrospective data with the following.

> It seems unfortunate that Mordoff and Parsons apparently drew their conclusions just prior to the first publications of our own and other more recent empirical studies. Their interpretations of findings seem unduly subjective, since the studies they cite were indeed productive, though not conclusive, and significant directions between coronary and control groups were found. (p. 427)

Several methods are available for measuring Type A behavior patterns. These include (a) the Structured Interview developed by Friedman and Rosenman, (b) Jenkins Activity Survey, (c) the Performance Battery and Short Rating Scale developed by Bortner, and (d) various assessment of stylistics. Since the Structured Interview and the Jenkins Activity Survey have been the two most widely-used assessment tools, this review of literature will focus primarily on these two assessment instruments.

The first method employed in determining Type A behavior was the Structured Interview devised by Friedman and Rosenman (1959). Although the interview method was not clearly defined in their first study, Friedman and Rosenman used this method in determining Type A and B behavior patterns in the 164 subjects of their first study. Three groups of men were selected on the basis of

whether they exhibited signs that Friedman and Rosenman considered were indicative of an overt behavior pattern. These signs included excessive rapid body movements, tense facial and body musculature, explosive conversational intonations, excessive unconscious gesturing, a guise of impatience, hand or teeth clenching, and verbal admission to having a sustained drive, competitiveness, and chronic sense of time urgency. If the individual exhibited these behaviors, then he was classified as Type A. On the other hand, if the individual was relaxed, moved slowly and calmly, exhibited no muscular tension or impatience and denied having moderate drive, ambition, or sense of time urgency, then the individual was considered Type B. The other group of men were not assessed by the interview method, but were classified by their exhibition of resignation, worry, and hopelessness. When the variables of coronary artery disease and arcus senilis were compared in the two groups, it was found that the group with Pattern A behavior had the highest frequency of both (Friedman & Rosenman, 1959). Thus, this was the first time that an interview method had been used in determining overt behavior patterns. There was no mention, however, of any structured

questions or quantitative measurement of this behavior pattern (Friedman & Rosenman, 1959).

By the time Friedman and Rosenman had launched their first major prospective study in 1960, they had standardized their interview method and had trained others in the use of this technique (Friedman & Rosenman, 1974). Using this method, Friedman and Rosenman and others who they had trained assessed and categorized the behavior patterns of over 3,000 men. Type A behavior as measured by this standard interview method was found to be associated with both prevalence and incidence of coronary heart disease (Rosenman et al., 1964, 1966, 1970, 1975).

However, Friedman and Rosenman realized that there were many difficulties involved in surveying large groups of subjects for the determination of Type A or B behavior patterns. For example, when using this interview method, the assessor must be trained in this technique, and even though the individual had been trained, there was still the problem of a trained interviewer incorrectly classifying subjects because of either a lack of time or an indiscretion in interpreting particular features of the behavior.

Therefore, Friedman and Rosenman (1960) developed a psychophysiological test to detect Type A behavior. This test consisted of a polygraph recording of various physiological responses of subjects who listened to a specially-designed tape recording of two monologues. Three groups of subjects were chosen for the test. The first group consisted of 20 consecutive patients who met the following criteria: (a) electrocardiographic evidence or history of coronary artery disease, (b) no evidence of pulmonary or other types of cardiac disease, (c) no evidence of cardiac decompensation, and (d) under 60 years of age. There were 15 men and 5 women in the group. The second group consisted of 15 control subjects who were also under 60 years of age and were not patients but normal persons. The subjects were selected using the following criteria: (a) no evidence of cardiopulmonary disease, (b) had both parents either alive or survived for 65 years without obvious cardiac disease, and (c) were determined to be Type B behavior as measured by the Structured Interview Method. There were 13 men and 2 women in this group (Friedman & Rosenman, 1960).

The third group consisted of seven neurotic subjects who exhibited signs and symptoms of cardiovascular disease, but were free of clinical coronary or other

cardiopulmonary disease. There were six men and one woman in this group (Friedman & Rosenman, 1960).

Each subject was asked to listen to the tape recording of two monologues, one spoken by a man and the other by a woman. The male monologue served as a control and consisted of a discussion about factors necessary for vocational success. It lasted for 942 seconds and was delivered in an even, rapid, and forceful voice. This monologue was interrupted for a total of 12 times by the second monologue, which was designed to be the challenge monologue. It conversed a trivial, uninteresting subject at a slow, hesitant pace in a soft, pleasant, feminine voice. The total time for the second monologue was 742 seconds (Friedman & Rosenman, 1960).

While the subjects listened to the tape recording and during a quiet baseline period before the monologues were turned on, the subjects were connected to a polygraph machine which recorded respiratory excursions and body movements. One technician remained in the room with each subject while he/she listened to the tapes to note the time each monologue was started. Each subject was also observed by Friedman or Rosenman without the subject being cognizant of these additional observers (Friedman & Rosenman, 1960).

Friedman and Rosenman (1960) found that through direct observation that most normal subjects showed few or no signs of irritation, restlessness, tension, or anger during their audition. In contrast, 13 of the 20 patients with coronary heart disease showed signs of tension, restlessness, as well as anger. These reactions appeared more frequently during the short female monologue. Friedman and Rosenman were unable to determine any difference in the level of tension or anxiety in the neurotic group, but they did find that there were no signs of anger in these subjects (Friedman & Rosenman, 1960).

The polygraph test revealed that the inspiratory phase of the respiratory curves of the patients with coronary heart disease were significantly more abrupt throughout both monologues than those of both the normal subjects and the neurotic subjects. The patients with coronary disease exhibited more body movements during both monologues than did the normal subjects. The neurotic patients had more body movements than the coronary heart disease patients. Also in comparison to the normal subjects, the coronary patients had greater expansion of the upper chest than the lower half of the chest and had three times more respiratory deformities. Friedman and

Rosenman used frequencies in calculating their data as well as a male/female ratio of these frequencies during the monologues.

Thus, this psychophysiological test did differentiate patients with coronary heart disease from the normal subjects. As a result of these findings, Friedman and Rosenman (1960) believed that this psychophysiological test could be used to assess Type A behavior pattern. However, Friedman and Rosenman (1974) learned later that this psychophysiological test did not reliably determine Type A behavior patterns. Unfortunately, to date, a study validating this conclusion could not be located.

Nonetheless, Friedman and Rosenman (1974) claimed that this test had failed on a large scale because they believed that Type A individuals had the ability to stop listening when they became disinterested. They have termed this phenomenon, polyphasic thinking, thinking about another subject while pretending to listen to something or someone else (Friedman & Rosenman, 1974).

Keith, Lown, and Stare (1965) set out to examine the methods that Friedman and Rosenman had used to determine Type A behavior and to determine the association between Type A behavior and coronary artery disease. One hundred eighty-nine Caucasian men in three hospitals

were studied, ages ranging from 35 to 55 years. There were three groups of patients selected: (a) patients with clinical coronary heart disease, (b) patients with peptic ulcer disease, and (c) control with neither of these diseases. Both inpatients and outpatients were selected--136 inpatients and 53 outpatients. Each patient was interviewed by one of the investigators who had been trained by Friedman. The patient's medical diagnosis was unknown to the interviewer. In addition to the interview, 65 consecutive patients in one hospital underwent the psychophysiological polygraph procedure developed by Friedman and Rosenman (Keith et al., 1965).

Only 47% of the patients with coronary heart disease had been designated as Type A using the Standard Interview Method (Keith et al., 1965). Twenty-nine percent of the ulcer patients and 32% of the control patients were judged as Type A behavior pattern. The coronary patients were categorized according to age into two groups--35-44 and 45-49 years old. The interview method for rating Type A behavior was then determined to be more effective in differentiating coronary patients for the 35-44-year-old age group. Two-thirds of the coronary patients were designated as Type A. However, for the older age group, the converse relationship was

found--two-thirds of the coronary patients were rated as Type B. When the interview ratings for hospital vs. the outpatient setting were compared, there was no relationship found. Outpatients with coronary heart disease were just as likely to be labeled Type B as those patients who were in the hospital (Keith et al., 1965).

The polygraph test rated 23 of the 38 coronary patients as Type B and 15 of the 27 noncoronary patients as Type A. Because the groups were small, they combined the peptic ulcer and control groups in compiling the data. By this method, more coronary patients were determined Type B. In comparing the two methods for determining Type A behavior pattern, there was a high level of disagreement. The two methods were in agreement for only 38 of the 63 patients tested. However, it was found that the interview method was more reliable, but not to the extent that Friedman and Rosenman had shown in their previous studies. Keith et al. (1965) attributed this difference, to some degree, to be related to the difference in the populations sampled.

Since there seemed to be some question as to the reliability of the structured interview method, Friedman and Rosenman saw a need to reexamine the reliability of their technique for differentiating the behavior patterns

of Type A and Type B (Jenkins, Rosenman, & Friedman, 1968). This study employed the data that were drawn from tape-recorded personal interviews of the Western Collaborative Group Study. During the interviews in the Western Collaborative Group Study, the subject's motor and emotional responses to specific questions had been examined in classifying Types A and B behavior patterns. In this study, the identical tapes were utilized in assessing Type A and B behaviors. The authors, however, recognized their limitations in regard to their inability to assess the motor responses from audiotape recordings (Jenkins et al., 1968).

To test for reliability a psychologist, who was not a part of the Western Collaborative Study Group, rated 75 tape-recorded interviews that were randomly selected within age and occupation stratifications (Jenkins et al., 1968). For the first 25 interviews, assessments were made using the 4-point scale and compared to previous ratings. In distinguishing Type A behavior from Type B behavior, the psychologist was in agreement with the previous rater for 21 of the 25 interviews, an 84% interrater agreement. Exact replication for the 4-point rating scale occurred in 16 of the 25 interviews, a 64% interrater agreement (Jenkins et al., 1968).

The psychologist had rated more subjects Type A than the original assessor. Jenkins et al. (1968) attributed this consistent disagreement to be related to the inexperience of the psychologist as a rater.

For the other 50 interviews, each response of each subject was rated as either being Type A or Type B behavior. Items that did not involve judgement and judgments that were based on motor responses were eliminated. A total of 27 items were compared to the previous ratings that had been recorded on the tally sheets by the original interviewers. The mean rate of agreement on the 27 items was 76.5%. In 40 of the 50 subjects, 70% or more of the items were identically rated by the two assessors. The correlation coefficient was +0.69 (Jenkins et al., 1968).

In testing for stability, the Jenkins group (1968) examined the data from the Western Collaborative Group Study. They compared the interview ratings of 1,113 subjects done at the onset of the Western Collaborative Group Study to a repeat interview done on the same subjects at their first follow-up examination. The identical team of interviewers and raters was employed in both ratings. Since 12-20 months had elapsed in time and each interviewer had interviewed from 600 to 900

subjects, the authors maintained that the first rating had little influence on the second rating. About 79% of the men rated A at the beginning were rated A at the follow-up examination and 82% of the men were re-rated as Type B. On the 4-point scale, 66.4% of the men scored exactly the same on both occasions. In terms of the Type A and B categories, 80.4% of the subjects were consistently rated the same on both occasions. The tetracholic coefficient of the test-retest reliability of the behavior pattern judgment was +0.82 (Jenkins et al., 1968).

Jenkins et al. (1968) were pleased with the results of this study. They maintained that reliability of their interview method was comparable to those of standard diagnostic procedures in the fields of internal medicine, radiology, psychiatry, and psychological testing.

The research study of Jenkins et al. (1968) was supported by Caffery (1968). In this study, Caffery investigated the relationship between interview times, personality scales, and ratings given by a superior and a peer. The sample consisted of 1,433 Benedictive and Trappist Monks who were available for the study. The structured interview and Cattell 16-PF Inventory were administered to the subjects by an interviewer who had

been trained by Friedman. In addition each Monk was rated by a report from his superior and one peer from personal experiences with the individual. Also, three physicians ranked the monasteries on the degree to which the atmosphere would elicit Type A behavior pattern. The Spearman rho coefficient was calculated to estimate the reliability of these judgments. The interrater reliability coefficient for the Rosenman-Friedman ratings were determined by Kuder-Richardson estimates (0.64-0.75). All ratings on the Rosenman-Friedman interview were significantly related to six of the 16-PF scales for the subjects but had considerably low correlations (0.09 to 0.22) (Caffery, 1968).

However, Caffery (1968) concluded that descriptions of Type A individuals by the Cattell factors were consistent with that presented by Friedman and Rosenman. The factor analysis also supported that the interview method was independent in determining Type A behavior from either variables of neurotic anxiety, responsibility levels, education, and extroversion (Caffery, 1968).

Although the standard interview method had been shown to be a reliable and valid measurement of Types A and B behavior patterns, investigators continued to

search for a more simple and economical scale to measure these behaviors. Jenkins, Rosenman, and Friedman (1967) conducted a study to develop a more automated, objective technique for measuring the coronary-prone behavior. They devised a questionnaire consisting of 61 questions called the Jenkins Activity Survey. This questionnaire was first administered to the entire population of the Western Collaborative Group Study. Ninety-two percent of the subjects completed the questionnaire. The scores from the Jenkins Activity Survey that were received during the first 6 months were cross-validated with scores in the standard interview obtained from the first assessment and the follow-up assessment of the Western Collaborative Group Study. The overall rate of agreement between the interviews and Jenkins Activity Survey was 72.4%. The chi-square score was 67.6, and the tetrachoric correlation coefficient was 0.67 (Jenkins et al., 1967).

In virture of the low concurrent validity score, investigators sought to increase the degree of agreement between the Jenkins Activity Survey and the Structured Interview. Jenkins, Rosenman, and Zyzanski (1974) entered the Western Collaborative Group Study in 1965 to test the reliability and validity of the Jenkins

Activity Survey in assessing persons at a high risk of incurring coronary heart disease. A total of 2,750 subjects free of coronary heart disease were asked to complete the Jenkins Activity Survey during their re-examination in 1965 and again in 1969. These patients were followed for 4 years to determine the onset of coronary heart disease. The investigators who developed and scored the Jenkins Activity Survey were held blind of any other data and likewise, the other investigating teams were unaware of the results of the Jenkins Activity Survey (Jenkins et al., 1967).

Test-retest reliability was determined after 1 and 4 years. The results showed a 0.65 correlation between the testing occasions for the Type A scale, the speed-impatience, and the job involvement components of the Jenkins Activity Survey (Jenkins et al., 1967).

The predictive validity of the Jenkins Activity Scale was determined by comparing the scores on the Type A component scale of 120 subjects who had developed coronary heart disease to a control sample of 524 subjects who were still free of coronary heart disease. The rate of new coronary heart disease was highest in the subjects who scored +5 on the Type A scale and lowest in the men with scores less than -5. The Jenkins

Activity Survey had been standardized to have a mean of 0.0 and standard deviation of 10.0. Scores in the positive direction, greater than 0, indicated the Type A direction and scores in the negative direction indicated Type B direction. Jenkins et al. (1967) concluded, then, that this scale had misclassified too many subjects and that more research was required before the instrument could be released for clinical assessment of Type A behavior.

In yet another effort to validate the Jenkins Activity Survey, Kenigsberg, Zyzanski, Jenkins, Wardell, and Licciardello (1974) studied 90 patients in an urban hospital in Connecticut to determine the association between coronary heart disease and Type A behavior as measured by the Jenkins Activity Survey. Forty-eight patients had been diagnosed with coronary heart disease, and the other 42 patients were surgical or trauma patients who had no evidence of coronary heart disease. The Jenkins Activity Scale that had been revised in 1972 was administered to all the patients. The difference between the scores of the two groups was computed using the t-test. The Type A scale was significantly higher in the coronary patients than in the control patients (t = +2.25, p = .014). This study was important in that

it supported previous findings of the Western Collaborative Group Study (Kenigsberg et al., 1974)

In other attempts to develop an efficient and objective measurement of coronary-prone behavior, Bortner and Rosenman (1967) conducted a study to assess the feasibility of determining Type A behavior pattern using quantitative-scoring methods. The two methods used for measuring Type A behaviors were the Jenkins Activity Survey and the Bortner Performance Battery test. A brief form of the Structured Interview was used for cross-validation. The authors (Bortner & Rosenman, 1967) recognized that this shorter form of the interview was a limitation to the study.

The Bortner Performance Battery test was designed to develop an additional quantitative measurement of Type A behavior. This scale consisted of a series of performance battery tests that were designed to elicit Pattern A behavior. One example of such a task was a subject being asked to study and recall 10 words that were on 10 separate sheets of papers. The time between the point at which the examiner gave the papers to the subject and when the subject returned the papers back to the examiner was recorded. Also the number of errors made in recalling the words were noted (Bortner & Rosenman, 1967).

The sample consisted of 76 male volunteers who were businessmen. Each subject was scheduled separately for the performance battery test and the blood sampling, interview rating, and blood pressure determination. The Jenkins Activity Survey was given to each subject to complete later and return back by mail. The questionnaire responses were evaluated independently of the other two measures of Type A behavior pattern. These measures in combination produced a multiple correlation of 0.64 (Bortner & Rosenman, 1967).

The assessment of Type A behavior by the structured interview correctly rated 72% of the subjects. There was no relationship found between the Jenkins Activity Survey and the performance battery test. The authors concluded that both the Jenkins Survey Activity Scale and the Bortner Battery Performance Test needed further development (Bortner & Rosenman, 1967).

Bortner (1969), in attempting to develop a scale that would objectively and accurately identify Type A behavior, conducted another study to validate his new short rating scale. This tool consisted of 14 rating scales that were measured on a 1-1/2-inch line. At the extreme left, there was a criterion, like not competitive, and at the extreme right another criterion, like

very competitive. The respondent would be asked to rate himself by marking where he was on the continuum. The scales were scored by measuring this mark to the nearest 16th-inch on the scale. The higher ratings would indicate a higher degree of Type A behavior (Bortner, 1969).

Seventy-six men comprised the sample of this study. These men were participants of the Western Collaborative Group Study. Ninety percent of these subjects returned their scales. Forty-seven of these individuals had been rated as Type A and 29 as Type B by the interview method. The men who had been originally classified as Type A by the interview scored 211.51 on the Bortner Short Rating Scale while the Type B group scored 178.21. The difference was considered statistically significant by the t-test ($t = 4.34$, $p < 0.01$). Bortner (1969) concluded that this scale had measured Type A behavior but not as completely as the interview method since the nonverbalized aspects of Type A behavior could not be assessed on this scale.

In other efforts to devise a simple, objective method of measuring Type A behavior, Friedman, Brown, and Rosenman (1969) investigated a voice analysis test for detecting Type A behavior patterns. This study was

based upon the assumption that most Type A subjects possessed three characteristics: (a) explosive vocal intonations, (b) eagerness to win in challenging activities, and (c) latent hostility. An apparatus was devised to record the explosive vocal intonations and a two-paragraph manuscript was developed to induce the characteristics of competitiveness and latent hostility. This manuscript consisted of a military commander exhorting his troops before they engaged in battle. Each subject was asked to read the manuscript twice; the first time they were to read the manuscript as if they were alone, and the second time they were to read the manuscript pretending they were the officers exhorting their troops. The time it took for each subject to read the manuscript was measured. Voice oscillations were measured by those that exceeded the baseline of 2.5 cm, which was decided upon before the procedure was begun. This baseline took into account artifacts.

The sample consisted of 73 subjects, 19 Type A patients without coronary heart disease, 16 Type B subjects without coronary heart disease, 12 patients with angina pectoris, and 26 patients with myocardial infarctions (Friedman et al., 1969). The preestablished behavioral assessment had been determined by the

Structured Interview Method. The Type B subjects had few or no oscillations which exceeded the baseline during their first reading. Their average noise-free period was 45 seconds of the 46 seconds that it took for them to read the manuscript. The average index was 1.06 (ratio of total reading time/noise free time). During the second reading, the average noise-free period was 31 seconds, an average index of 1.43. As determined by the t-test, the second reading was significantly greater than that of the first reading.

For the Type A subjects their first reading took 46 seconds. The average noise-free time was 30 seconds, which was significantly less than the Type B subjects. When Type A subjects reread the script, their average total time was decreased significantly to 38 seconds. These subjects exhibited more oscillations exceeding the 2.5 cm baseline--the average noise-free period was reduced to 14 seconds. Sixteen of the 14 Type A subjects exhibited an abnormally high index of 1.95 during the second reading (average index was 1.43) (Friedman et al., 1969).

Eleven of the 12 patients with angina and 18 of the 26 patients with infarctions had abnormally high indexes during the second reading (> 1.95). Twenty-one of the

26 myocardial infarction patients and each of the 12 patients with angina pectoris were judged to exhibit Type A behavior. These results, according to the authors, suggested that the voice analysis test had successfully identified the majority of Type A and B behavior patterns, but that it yet lacked the accuracy of the interview technique in terms of identifying the time urgency component (Friedman et al., 1969).

Schucker and Jacobs (1977) also attempted to classify Type A behavior on the basis of voice characteristics. They analyzed 100 standardized taped interviews provided by Rosenman. The speech styles that they defined as important aspects of Type A behavior consisted of explosive words, clipped words, uneven deliverance of words, repeated words, interruptions, talking over, silence latency, delay question latency, overall volume of voice, and overall speed of speech. Frequency counts and timing were the methods used for measurement. They found that this method of assessing Type A behavior to be valid and reliability with 86.7% agreement with the Structured Interview method.

Sparcino, Hansell, and Smyth (1979), while studying the relationship between Type A behavior and transient blood pressure changes, found that certain voice

characteristics were related to Type A behavior pattern. Thirty-three Black women from the inner-city of Chicago comprised the sample. The women ranged in age from 20 to 62 years with the mean age of 41 years. None of these subjects reported a history of cardiovascular disease. While each subject was interviewed privately using a modified version of the Structured Interview Method, their blood pressures were being taken at 2-minute intervals using an ultrasonic device designed for measuring intermittent blood pressures. These interviews were taped using microphones hung from the subject's neck. The discrimination of the subject's behavior patterns was done by the interviewer and technician. Also an experienced rater from Rosenman and Friedman's laboratory furnished an additional rating based on the audiotapes.

Interrater agreement was not considered high--the technician and interviewer had 71% agreement, the technician and experienced rater had 67% agreement, and the interviewer and the experienced rater had 73% agreement. The subject was ultimately judged as either Type A or B if the subject had been rated the same by at least two of the raters. By this criterion, 17 of the

33 women were classified as Type A and 16 were classified as Type B (Sparcino et al., 1979).

Also speech characteristics were analyzed in determining their prevalence in the Type A individual. The special vocal behavior that was measured at 1-minute intervals consisted of talking time, speech rate, channel, interruption, filled pause, disfluency, sigh, laugh, loudness, and explosiveness. The interviewer and technician rated each individual using three vocal behaviors as the criteria for measurement. They found that loudness and explosiveness had a high correlation but only a .65 interrater reliability. Speech latency and talking time were highly correlated with a rank order correlation of .99. In terms of Type A and B, Type A individuals had longer talking time ($F = 3.63$, $p < .07$), higher speech rates ($F = 4.32$, $p < .05$), more back channels ($F = 6.36$, $p < .02$), more interruptions ($F = 5.10$, $p < .03$), more disfluencies ($F = 8.01$, $p < .01$), were louder ($F = 13.65$, $p < .001$), and more explosive ($F = 12.47$, $p < .001$) than the Type B subjects. Contrary to the authors' expectations, they found there was no significant difference in either sighing or laughing in the Type A and B individuals (Sparcino et al., 1979).

The correlation between the speech characteristics and blood pressure changes were evenly distributed for Type A and B individuals. "Type A-ness" as determined by the voice characteristics did not show an accompanying increase in blood pressures. This study was significant in that it supported the previous study of Friedman et al. (1969) that voice characteristics were important in determining Type A behavior pattern (Sparcino et al., 1979).

But even more important for nurses, this study constituted the only published research that could be located for this literature review in which nurses had actually participated in the study of Type A behavior. The need for nurses to conduct research in this area is vitally important; for nurses are in constant interaction with these patients and are in the position to make reliable and valid assessments of Type A behavior patterns.

In summary, for the present study, this review section has given support to the appropriate selection of Friedman and Rosenman's Structured Interview Method for measuring Type A behavior pattern. Although the use of this tool is more expensive and time-consuming,

it has been found to render the most reliable and valid data.

Psychosocial and Occupational Influences on Type A Behavior

Considerable research has been done on the various aspects of Type A behavior pattern. Only the psychosocial and occupational or environmental factors will be addressed in this section. These areas are important to nurses who are concerned with the total-person approach in their practice. Since there has been insurmountable work done on these two issues, only the classical and more recent studies will be emphasized in this literature review.

Psychosocial Influences

Waldron, Hickey, McPherson, Butensky, Gruss, Overall, Schmader, and Wohlmuth (1980) investigated the characteristics of Type A behavior in comparison with other psychological measures. The sample was comprised of 84 college students. The Type A behavior pattern was assessed by the Jenkins Activity Survey. To measure the psychological variables of time pressure, anger, general well-being, tension, hysteria, and assertiveness, the authors adopted several scales from Eysenck Neuroticism and Extroversion scales, MMPI

Hysteria Scale, and Allport's Test for Ascendance-Submission scale. They found that the Type A females exhibited the time-pressures style of life and hostility ($\underline{R}$ = +.35, $\underline{R}$ = +.36). Neuroticism was a strong correlate of Type A scores for the females (regression coefficients .51 and .46, $\underline{p} \leq .05$). For the males, no significant correlations were found. For the entire sample, Type A scores were not related for the self-rated scales for tension at the time the Jenkins Activity Survey was administered (Waldron et al., 1980).

However, Type A scores were significantly correlated to reports of tension during specific activities the week prior to the testing (Waldron et al., 1980). Type A females reported greater tension while being with friends, family, studying, and receiving grades or evaluations from their instructors. Type A males reported greater tension while being with girlfriends, going to movies, playing sports, and relaxing or wasting time. In summary, these results concurred with other studies (Glass, 1977; Jenkins, Zyzanski, Ryan, Flessas, & Tannenbaum, 1977) in finding no significant relationship between Type A behavior pattern and reported levels of tension. However, in this study, the subjects

reported higher levels of anxiety during specific activities the week preceding this testing (Waldron et al., 1980).

In another related study, Burke and Weir (1980) investigated the correlation between various affective states and Type A behavior pattern. The sample was comprised of 127 administrators of correctional institutions in a Canadian province. Type A was assessed by using a 44-item scale developed by Sales. This scale possessed internal consistency reliability (alpha coefficient = 0.90). Life demands were assessed by a 54-item scale adopted from Holmes and Rahe Social Readjustment Scale. Affective states were examined using a 90-item scale developed by Cobb. Psychosomatic symptoms were measured by a 19-item scale developed and validated by Goring, Weroff, and Field. Finally, social participation was examined by using a scale developed by Bradburn (Burke & Weir, 1980).

Burke and Weir (1980) found that Type A behavior was related to the number of stressful life events in the work setting ($\underline{r}$ = 21, $p < .01$) and to the total number of stressful life events ($\underline{r}$ = 22, $\underline{p} < .01$). Type A was significantly related to only one affective state, depression ($\underline{r}$ = .20, $\underline{p} < .05$). The individuals

who reported greater Type A behavior experience less depression. The Type A behavior was related to psychosomatic symptomatology. Type A behavior was not related to the number of good friends or frequency of visiting friends, and was related with participation in the community and professional groups. In terms of health behaviors, these investigators found four statistically significant correlations: (a) Type A subjects were less likely to be smokers ($r = 20$, $p < .05$), (b) less likely to have five or six drinks ($r = -.28$, $p < .01$), or (c) three or four drinks ($r = .24$, $p < .05$), and (d) were more likely to be on some form of medication at the time of the study ($r = .16$, $p < .05$). In addition they found that Type A behavior was not related to number of cigarettes smoked per day, cups of coffee drank per day, frequency of drinking alcoholic beverages, days off work due to illness, exercise habits, or nonroutine physician visits.

In conclusion, then, this study was significant in that it supported the findings of previous studies in relation to stressful life events occurring more often in Type A individuals. However, in terms of health behaviors, these findings were contrary to the findings

of previous studies; for example, Type A individuals smoked less than Type B individuals (Burke & Weir, 1980).

In an epidemological study, Haynes, Levine, Scotch, Feinleib, and Kannel (1978) investigated the relationship between psychosocial factors and coronary heart disease. The sample consisted of 1,822 members of the Framingham Heart Study. A 300-item questionnaire that was designed to measure personality type, sociocultural mobility, situational stress, and somatic strain was administered to each subject. This questionnaire was selected by a panel of experts and received internal consistency by item and factor analysis with values ranging from .51 to .86. A total of 20 scales were developed from the 300 questions (Haynes et al., 1978).

The investigators found that the Framingham Type A behavior scale was significantly correlated with daily stress (.47), emotional lability (.43), tension (.42), anger symptoms (.34), and ambitiousness (.31). Also Type A behavior as measured by the Framingham Scale was positively correlated with educational level (.10) and with occupational status (.22). Women were found more likely than men to be emotionally labile, to report symptoms of anxiety, tension, and anger and less likely

to be Type A and ambitious than men. No consistent relationship was found between Type A behavior and smoking habits (Haynes et al., 1978). This study supported the previous study reported by Burke and Weir (1980).

In the Framingham follow-up study, Haynes, Feinleib, and Kannel (1980) again investigated the relationship between psychosocial factors and coronary heart disease. The 300-item questionnaire was administered to 1,674 coronary free individuals who participated in the Framingham Heart Study between 1965 and 1967. These individuals were followed for the development of coronary heart disease over an 8-year period. They found that women between the ages of 45 and 64 years who developed coronary heart disease scored significantly higher on the Framingham Type A behavior, suppressed hostility, tension, and anxiety symptoms scales than the women who remained free of coronary heart disease. There was no significant difference in the Framingham Type A working woman and the Type A housewife. Both had more incidence of coronary heart disease than their Type B counterparts (Haynes et al., 1980).

In a multivariate analysis, the Framingham Type A behavior variable was an independent predictor of

coronary heart disease when compared to the traditional risk factors (Haynes et al., 1980). The men between the ages of 55 and 64 years who were rated as Type A behavior had suppressed hostility, frequent job promotions, and developed more coronary heart disease than the Type B men in the same age group. In the 45-64-year-old age group, Type A behavior was associated with coronary heart disease twice as much as the Type B behavior. This association was found only among white-collar workers and was independent of the traditional coronary risk factors and the other psychosocial scales.

This study was not only important in relating the psychosocial factors of coronary heart disease but also in confirming the findings of the only other prospective study of this nature, the Western Collaborative Group Study (Rosenman et al., 1964, 1966, 1970, 1975). In addition, this prospective study predicted the occurrence of coronary heart disease in both men and women who possessed Type A behavior patterns (Haynes et al., 1980).

Occupational Factors

The Western Collaborative Group Study (Rosenman et al., 1964, 1966) was the first study to find that higher occupational status was associated with higher Type A scores. That is, the white-collar workers were more likely to be Type A than the blue-collar workers. However, Friedman and Rosenman (1974) emphasized that the blue-collar workers are not immune from possessing Type A behavior pattern and that Type A behavior pattern may be seen in any occupation.

Waldron, Zyzanski, Shekelle, Jenkins, and Tannenbaum (1977) investigated the characteristics of sex, age, educational, and racial differences in employed individuals who possessed the Type A (coronary-prone) behavior pattern. The sample was comprised of 3,667 White men, 1,149 White women, 265 Black men, and 266 Black women, who were participants in the Chicago Heart Association Detection Project in Industry. Each participant completed the Jenkins Activity Survey Questionnaire. Factor analysis and multiple analysis of variance were employed to determine the degree to which the Type A behavior score and the three factor scores (speed and impatience factor, job-involvement factor, hard-driving and competitive factor) were influenced by sex,

age, educational, and race differences in this employed population (Waldron et al., 1977).

The investigators found the highest mean values of Type A and speed-impatience scores were in employed women between the ages 30-35 years. Coronary-prone behavior was more prevalent among employed women than housewives. In the comparison of employed men and women with similar educational levels, age, sex, and race, men between the ages 18-25 years scored higher on the Type A scale. For the men in the older age groups, sex differences were insignificant. Among all individuals, including housewives and employed persons, coronary-prone behavior pattern was more common in the men than women of the same age. Analysis of variance also revealed that job involvement and educational status were greater for men than for women and greater for Whites than for Blacks. Higher educational status was also related with higher Type A, speed-impatience, and job-involvement scores. The findings of this study were not the same as the findings of the Framingham study (Haynes et al., 1978, 1980) in regards to Type A behavior pattern in employed women and housewives which revealed no difference in the Type A scores.

In a related study, Waldron (1978) investigated the relationships among the coronary-prone behavior pattern, employment, and socioeconomic status in women. For the purpose of the study, the investigator used two samples to compare housewives and employed women. The first sample was comprised of 45 White women from a middle-class suburban neighborhood with a median education or trade school or business college. Seventy-one percent of these women were employed. The second sample consisted of 43 White women from another neighborhood in the same suburban area with a median education of some college. Sixty-five percent of these women were employed. Type A behavior was measured using the Jenkins Activity Survey (Waldron, 1978).

The researchers found that Type A scores were significantly higher for women whose occupational status was higher than their husbands in comparison with those women whose occupations were equal or lower than their husbands' occupations (Waldron, 1978). Women who were employed full-time had higher Type A scores than the women who were employed part-time or who were housewives. This finding supported the study of Waldron et al. (1977). In addition, Waldron (1978) also found that women with higher occupational status had higher

Type A scores than the women with lower occupational status. No significant findings were determined in relation to educational status (Waldron, 1978).

In another study of females, Davidson, Cooper, and Chamberlain (1980) investigated the relationship between Type A behavior pattern and coping-ability of 148 senior female managers and administrators. Type A behavior was measured by Bortner and Rosenman scales. Coping ability was measured by a questionnaire adapted by Chamberlain. Multiple regression was utilized for analysis of the data (Davidson et al., 1980).

The authors (Davidson et al., 1980) found that 21% of the sample possessed the extreme Type A_1 behavior pattern and 37.8% the Type A_2 behavior. The Type A behavior pattern was also related to age; the highest percentage of the Type A individuals fell in the 41-50-year-age group. Female managers with higher Type A scores also had higher scores on the anxiety, frustration, and irritation scales. These managers also perceived themselves as having higher stress levels in comparison to their cohorts. They also found that these managers with higher Type A scores perceived that their ability to cope with stress was less than their female peers and superiors; but better than their female

subordinates. Finally, they found that higher Type A managers did not perceive themselves as a source of stress to their subordinates . This study was important in that it supported previous findings that women in higher status positions have a greater predisposition toward Type A behavior patterns (Davidson et al., 1980).

In another study that has been previously reported, Burke and Weir (1980), in investigating the relationship between Type A behavior and occupational demands, found that Type A individuals reported more occupational demands, more stressful life events at work, and more interference of work with home and family life. Also, they found that Type A individuals reported more self-esteem at work and greater job involvement. The Type A individuals were more strongly identified with their work organizations (Burke & Weir, 1980).

In summary, then, the studies done on the influence of psychological and occupational factors on Type A behavior appear to be generally consistent. These studies have extended the notion that work environments may be precursors for the Type A behavior pattern because the working environment enhances and rewards Type A behavior pattern (Davidson et al., 1980; Friedman, 1979). Therefore, this review section has

provided additional support for the conceptual framework of the present study and has given the researcher a base for selection of the demographic characteristics to be included in the tool for describing the sample.

Modification of Type A Behavior

There has been much emphasis placed on the association between Type A behavior pattern and coronary heart disease. Researchers are now investigating how this behavior pattern can be modified. They maintain that if this behavior pattern can be changed, then there can be a resultant reduction in the risk of coronary heart disease. There has been little research done in this area to support this premise and none done by nurses. Therefore, there is a great need for more research to be conducted on the behavior modification of Type A individuals, which certainly falls in the realm of nursing research and practice.

Friedman and Rosenman (1974) suggested the practice of a set of drills for the modification of Type A behavior pattern. They maintained that these drills will assist the individual in establishing new habits to replace the old ones. There are three sets of drills that Friedman and Rosenman (1974) described: (a) a

drill against "hurry sickness," (b) a drill against hostility, and (c) a drill toward things of worth. Friedman (1979) purported that these drills must be practiced daily in order for the Type A individuals to begin decelerating their intellectual and physical activities and consciously substituting patience and affection for hostility.

Examples of the drill to decrease hurry sickness include such activities as (a) consciously reviewing once-a-week the cause of hurry sickness (b) reminding oneself that life itself is unfinished, (c) actually listening to what other persons are saying, (d) stop thinking of more than one thing at a time, (e) allowing others to complete their jobs without interfering, and (f) allowing time each day for the purpose of relaxation of mind and body (Friedman & Rosenman, 1974).

Examples of the drill to reduce hostility are the following: (a) reminding oneself that he/she is hostile, (b) verbalizing appreciation to others in a sincere manner, (c) avoiding the verbal expressions of disappointment in other people, and (d) smiling at others as often as possible (Friedman & Rosenman, 1974). The drill for increasing attention toward things worth being include (a) reminding oneself daily that things

are worthless if they do not improve one's spirit or mind, (b) taking time to improve one's vocabulary, (c) being flexible in one's opinions concerning politics, race, and religion, (d) avoiding reminding others of their mistakes, (e) spending time with oneself, (f) enriching one's friendships with others, (g) allowing time to learn new things that are not related to one's vocation, and (h) evaluating the progress of the drills in terms of quantity and ablation of old habits (Friedman & Rosenman, 1974).

Friedman (1979) stressed that it is extremely difficult for the Type A individual to change his behavior and almost an impossible task for the Type A individual who has not sustained a myocardial infarction. Friedman named four reasons for this belief. The first reason is that for these individuals, this behavior pattern is a source of pride and security. The Type A persons attribute their successes to their behavior pattern and are afraid that if they change their behavior, they will become failures (Friedman, 1979).

The second reason that Friedman (1979) believed that this behavior pattern is difficult to change is that these individuals are often pragmatic. They find it

difficult to perceive that one's behavior can actually lead to an arterial lesion.

The third reason is that these individuals believe that the other fellow will acquire coronary artery disease, not them (Friedman, 1979). This is the principle reason that Friedman believed that the Type A individual who has had a myocardial infarction is easier to change than the person who has not had one.

Also Friedman (1979) further stated that most physicians are not striving to modify this behavior pattern in their patients. Friedman pointed out that the cardiologists, themselves, probably do not have the patience to alter this risk factor.

Finally Friedman (1979) declared that it was not easy for these individuals to maintain a regimen like daily drilling indefinitely. Especially if they could not actually know for certain that these measures are prophylactic for acquiring coronary heart disease.

There has not been any documented study to date to support the benefits of practicing these drills. However, according to the Harold Brunn Institute, a prospective study is presently underway to investigate the effectiveness of these drills in terms of resolution

of the behavior pattern and reduction of recurring myocardial infarctions.

Suinn and Bloom (1978), in a quasi-experimental study, investigated the effect of anxiety management training on Type A behavior pattern. Anxiety management training is a conditioning procedure whereby anxiety is aroused in the individual and alleviated by the use of relaxation techniques (Suinn & Richardson, 1977). This training is based on the theory that clients can be conditioned to respond to cues of anxiety with a reciprocal inhibition to anxiety. Suinn and Richardson found that this anxiety management training was effective in reducing anxiety.

To investigate the effect of anxiety management training on Type A behavior pattern, Suinn and Bloom (1978) studied a sample of 14 subjects with an average age of 38 years. Two of the subjects were females and rest were males. Seven subjects were treated with the anxiety management training, and the other seven subjects served as controls. Pattern A was measured by the Jenkins Activity Survey. Self-reported anxiety was determined by the Spielberger State and Trait Anxiety Inventories. These measurements were obtained before

after the treatment. Also, blood pressure, cholesterol, and triglyceride levels were acquired (Suinn & Bloom, 1978).

The analysis of variance and covariance statistical tests were used in analyzing these data (Suinn & Bloom, 1978). The researchers found that there was a significant reduction on the hard-driving component score for the treated subjects as compared to the control group ($F = 4.77$, $p = 0.05$). Speed-impatience scores showed no significant results in the covariance analysis, but the analysis of variance for the posttest scores showed significant results ($F = 4.45$, $p < .05$) with the treated subjects scoring significantly lower than the control subjects. There was no significant difference on the pretest scores for the two groups. The Pattern A scores for the control group showed no significant change in the median value in pretest to posttest scores (median = 9.9 pretest and 9.8 posttest). The Pattern A scores for the treated group showed a significant reduction from the pretest to the posttest (median 11.1 and 6.8, respectively). For the STAI-S and STAI-T anxiety scores, the treated group scored significantly lower than the control group following the anxiety management training ($F = 6.31$, $p < 0.05$, STAI-S;

$F = 5.37$, $p < 0.05$, STAI-T). There was no significant difference in the pretest scores for both groups. Analysis of variance of blood pressures and serum lipids and cholesterol levels revealed no significant differences (Suinn & Bloom, 1978).

Suinn and Bloom (1978) concluded that Pattern A behavior could be changed by using the anxiety management training. Also the authors derived from their findings that stress was probably involved in the dynamics of Pattern A behavior and that the reduction of stress or reaction to stressors may be useful in changing Pattern A behavior.

In a nonclinical population, Roskies, Spevack, Surkis, Cohen, and Gilman (1978) attempted to modify Type A behavior patterns. For their study, they selected a sample of 25 professional and executive volunteers from the ages 39-59 years who had been medically determined to be free of coronary heart disease. These individuals were randomly assigned to two groups: (a) behavior therapy group and (b) psychotherapy group. The behavior therapy approach utilized the Jacobsonian relaxation technique, which is the progressive tightening and relaxing of muscle groups. The psychotherapy treatment consisted of a corrective

emotional experience using male and female therapists as role models. Thirteen subjects comprised the psychotherapy group and 12 were in the behavior therapy group. Each group met for 14 sessions over a 5-month period. Physiological variables of blood pressure, serum cholesterol, and triglycerides were obtained before and after the treatments. Psychological and psychophysiological measures were also obtained prior to and after treatments, using a questionnaire on the number of hours of overtime worked per week, responsibility on the job, time spent in recreational activities, and sense of time pressures; an 11-item Satisfaction Scale adopted from Theorell and Rahe's Life Satisfaction Index; a 60-item version of the General Health Questionnaire; and the Spielberger State-Trait Anxiety Inventory (Roskies et al., 1978).

Analysis of variance was used to analyze the data (Roskies et al., 1978). The investigators found that neither treatment group showed significant changes in work, recreation, or health habits following the treatments. There was a statistically significant difference in serum cholesterol levels, systolic blood pressure, number of psychophysiological symptoms, life satisfaction, and sense of time pressure. Nineteen of

the 25 participants who completed the treatments showed a decrease in serum cholesterol levels. Behavior therapy subjects had a larger mean decrease than did the psychotherapy group (43 mg/100 ml to 16 mg/100 ml), but did not meet a statistically significant difference (Roskies et al., 1978).

In conclusion, Roskies et al. (1978) asserted that their study, although it was exploratory, was important in that it investigated the feasibility of modifying Type A behavior pattern in a nonclinical population. They further stated that their major finding was that both types of treatments were feasible and probably beneficial as means of modifying Type A behavior pattern. Roskies et al. (1978) did admit that many questions yet needed to be resolved and further exploration was warranted.

The benefits of modifying Type A behavior pattern have not been shown empirically. However, theoretically, the rewards of such a change in behavior may result in longer and more satisfying lives. It is this benefit that should lead nurses to be instrumental in investigating methods of modifying Type A behavior pattern. Therefore, this section has rendered support to the benefits of the present study in terms of a potential of

the results to provide additional information that may be instrumental in developing methods of modifying Type A behavior pattern. For example, the establishment of the locus of control of Type A behavior pattern may be an important link for further research in the modification of Type A behavior pattern.

Locus of Control

It is the purpose of this study to investigate the relationship of the locus of control of Type A and B individuals which is believed to be important in determining these individuals' methods of learning and achievement. Therefore, this literature review will discuss how locus of control is related to achievement and how locus of control may be related to behavior patterns.

Locus of Control and Achievement

The investigation of locus of control and achievement was begun with the study of children. Crandall, Katkovsky, and Preston (1962) investigated the relationship between children's achievement levels and their locus of control. The sample was comprised of 40 students in the first through third grades, 20 boys and 20 girls. The researchers utilized the Intellectual

Achievement Responsibility Questionnaire to determine the locus of control scores. The Stanford-Binet Intelligence Test and the California Achievement Test were employed to measure the achievement scores (Crandall et al., 1962).

Each child was observed for a week in a day camp to determine free-play activities. The time spent in intellectual activities and the intensity of striving in activities were recorded by the observers. Crandall et al. (1962) found that the Intellectual Achievement Responsibility Questionnaire was strongly related to the time spent in intellectual free-play activities ($r = .70$, $p < .05$) and to the intensity of the striving ($r = .66$, $p < .05$) among the boys. For the girls, no relation was found.

In comparison of the intelligence and achievement tests, the researchers found that for the boys, the Intellectual Achievement Responsibility Questionnaire was significantly related to both tests ($r = .52$, $p < .05$ with intelligence, $r = .51$, $p < .05$ with reading achievement; $r = .38$, $p < .05$ with arithmetic achievement). There was no significant relationship found with the girls' scores. In conclusion, the boys who were considered internally controlled spent more time in

intellectual activities and scored higher on intelligence tests than the externally controlled boys; but, for girls, there was no relationship found (Crandall et al., 1962).

Crandall, Katkovsky, and Crandall (1965) in a later study, again investigated the relationship between the Intellectual Achievement Questionnaire scores of children and their levels of achievement. The sample consisted of 923 elementary and high school students. The California Test of Mental Maturity and report cards were used to measure achievement for the children in the 6th, 8th, 10th, and 12th grades. The Iowa Test for Basic Skills and report cards were used to determine achievement for the third, fourth, and fifth graders. The Fisher q statistics, product-moment correlation, and the t-test were used to analyze the data (Crandall et al., 1965).

Crandall et al. (1965) found that the Intellectual Achievement Questionnaire scores were significantly related to reading, mathematics, language, and total achievement scores for the third, fourth, and fifth graders, both boys and girls. There was a similar relationship between the report cards and the Intellectual Achievement Questionnaire scores. In further analysis by

sex, they found that the girls in the third and fourth grades who scored high on the achievement tests also made better grades on their report cards. But for the boys in the fifth grade, the negative scores on the Intellectual Achievement Questionnaire were related to all the other measures. Thus, indicating a difference in the Intellectual Achievement Questionnaire scores for the girls and boys who scored high on the other measures. For the 6th, 8th, 10th, and 12th graders, there was only an occasional relationship between their achievement test scores and the Intellectual Achievement Questionnaire Scores, but there was a significant relationship between the report card grades and the Intellectual Achievement Questionnaire Scores. Thus, the results from this study were different from those of their first study in that a relationship was found for both boys and girls when the scores were combined, but only for girls when the scores were separated (Crandall et al., 1962; 1965).

In another replication, McGhee and Crandall (1968) obtained the same results as had been found in the previous study (Crandall et al., 1965). They conducted two separate studies with sample sizes of 923 for the first one and 134 for the second study. For both studies,

the Intellectual Achievement Questionnaire was predictive of grades on report cards for males and females. However, the females essentially continued to have positive Intellectual Achievement Questionnaire scores related to higher achievement test scores, while the males' negative Intellectual Achievement Questionnaire scores were related to higher achievement test scores. That is, the girls' achievement test scores were related to their belief in responsibility for their successes and failures; the boys' achievement test scores were associated to their belief in responsibility only for their failure.

Crandall and McGhee (1968), in another research project, conducted five separate studies to determine the relationship between expectancy of reinforcement and academic competence in junior high school, high school, and college students. The first study consisted of a sample of 140 eighth grade boys; the second study, 126 male and 130 female eighth graders; the third study, 39 male and 31 female ninth graders; the fourth study, 37 male and 56 female college students; and the fifth, 68 male and 84 female high school seniors. Expectancy was measured by using angle-matching tasks where the student was asked to estimate his expected level of

performance. Level of competence was estimated in the first study by report cards and scores on the Iowa Test of Basic Skills; for the second study, grade average; for the third study, the California Achievement Test scores; for the fourth study, course grades; and for the fifth study, the Iowa Tests of Educational Development and grade averages. All five studies showed that there was a positive relationship between expectancy estimates and academic performance (Crandall & McGhee, 1968).

Lessing (1969) in a large-scale study investigated racial differences in relation to adaptive ego functioning, a variable of academic achievement. The sample consisted of over a thousand grade school and high school students from three suburbs near Chicago. The students' sense of personal control was measured by the Personal Control Scale. Grade-point average and Intellectual Quotient score on the students' record were used to measure achievement. Lessing found that Black children had lower academic achievement than White children. Also sense of personal control was positively related to grade-point averages of the students. White students showed significantly more personal control over their lives than did Black

students. Thus, this study gave support to previous studies related to locus of control and achievement.

In a study of college students, Phares (1968) investigated the relationship between locus of control and utilization of information. Rotter's Internal-External Scale was used to measure locus of control. Acquisition, utilization, and retention were measured by the student's ability to recall and to make decisions.

Analysis of variance was used to analyze the data. Phares (1968) found that internals utilized information better than externals. There was no difference in acquisition and retention of knowledge between the internals and externals. This study supported other research that found internals to be higher achievers than externals (Phares, 1968).

In another study of college students, Feather (1967) investigated the probability of success, attractiveness of success, and repulsiveness of failures in relation to task difficulty and locus of control. Seventy-six students, 30 males and 46 females, comprised the study. Rotter's Internal-External locus of control scale was used to measure the student's locus of control. Analysis of variance was utilized for data analysis. Feather found that highly structured information for success or

failure that involves skill or luck dominates judgments, attractiveness, and repulsiveness. Personality variables had little effect. When success or failure depends upon the ability of the person, the student viewed success as more attractive and failure as less repulsive. When success or failure depended upon luck, the student saw unlikely-success more attractive than likely-success. Also, under the latter condition, repulsiveness of failure is relatively low. There was no difference in likely failure and unlikely failure. There was no difference in the scores of the achievement and debilitating anxiety. The researcher also found that expectations of success are modified by the student's experience with success and failure as a result of his own ability but not when influenced by chance.

Thus, this study has supported Rotter's theory that expectancies of reinforcement are related to the individual's past experiences and his perception of internal or external influence upon the outcomes of his actions. The study also lends support to previous research which has found that achievement is higher in the internals than the externals.

In a study of Black college students, Lao (1970) investigated the relationship between locus of control;

achievement, and innovative behavior. The sample was comprised of 50 males and 50 females from 10 Black colleges in the South. The Rotter Internal-External Locus of Control Scale was used to determine the student's locus of control. Grade-point average and the student's entrance examination test score were used to determine achievements. A questionnaire adapted from the Individual-System Blame and Discrimination Modifiability Scales was used to measure innovation. Analysis of variance was used to analyze the data.

Lao (1970) found that internal students had higher achievement while external students were more innovative. As a result of this finding, Lao concluded that for this culture, it may not always be desirable for Black youth to believe in internal control for success and failure. Instead, he stated that Black students who can recognize the obstacles of the system can make a more realistic assessment of situations in terms of cultural and personal limitations. As a result, these individuals are more likely to choose innovative roles in their occupations and social activities (Lao, 1970). While this study supported previous findings, it also provided additional information related to innovation.

Puryear (1978) also investigated the relationship between locus of control and achievement in the Black college student. Locus of control was measured by the Personal Control Scale. Two samples comprised the study--lower ability and higher ability students. The first sample consisted of 151 students in a special remediation program at a large predominantely Black Eastern university, and the second sample included 126 students enrolled in several freshman classes at the same university. Puryear (1978) found that there was no relationship between locus of control and achievement for men or women. In addition, this study found no relationship between achievement and the students who were internal for both success and failure, the students who were external for both success and failure, the students who were internal for success and external for failure, or the students who were external for success and internal for failure.

This review of literature related to locus of control and achievement revealed relatively consistent findings. The individuals who are internally controlled usually have higher achievement levels than the externally controlled. This result has been more consistently observed in the White culture than the Black

culture and in females than the males. The reasons for this difference have not been clearly shown, but some researchers have attributed these differences to be related to the different types of instruments used for measuring locus of control.

In summary, this review section has provided additional support to the conceptual framework of the present study. That is, locus of control has been found to be positively related to achievement.

Locus of Control and Type A and B Behavior Patterns

The relationship between locus of control and behavior patterns will be examined in this literature review. Because of the paucity of reported literature in the study of the association between these two variables, only two research studies will be presented. The rest of the literature review will compare characteristics of the locus of control constructs and behavior patterns.

The first characteristic that will be compared is achievement striving. Burnam, Pennebaker, and Glass (1975) found that Type A individuals worked at near maximum capacity in striving to achieve if a deadline was present or absent, while the Type B individuals

worked at near maximum capacity when there was an explicit deadline present. Matthews and Saal (1978) found that Type A individuals had a higher need to achieve than Type B individuals. In an immediate recall experiment, Type A individuals achieved higher recall scores than Type B individuals (Glass, 1977). Type A persons reported receiving more honors in college than Type B individuals, but no statistically significant difference was found in the number of high school academic honors (Glass, 1977).

In comparison, previous studies have shown that internally controlled individuals are higher achievers than the externally controlled (Crandall et al., 1962, 1965). However, the need for achievement showed no relation to locus of control. Hersch and Scheibe (1967) found that internals are more likely than externals to describe themselves as active, striving, achieving, powerful, and effective. Thus, the Type A individual as well as the internally controlled individual have been shown to be related to higher achievement, while the greater need for achievement striving has only been shown in Type A individuals.

The other characteristic that will be compared is the response to stress. Houston (1972) found that

internal individuals became more physiologically aroused under stress than the externals. In contrast, Lobstein, Webb, and Edholm (1979) found that externals showed greater heart-rate and sweat-rate increases in response to unexpected stimuli than did internals. Lefcourt (1967) found that externally controlled individuals were more affected by changing conditions than internals who showed little or nonsignificant changes. The externals tended to withdraw from challenges and avoided involvement. Wolk and Bloom (1978) found that internal subjects were able to sustain task performance under high stress while externals experienced decrements in performance under increased stress. However, it was also found that internals showed decreased adaptive responses when the stress was perceived as a threat to ego integrity. Brissett and Nowicki (1973) also found that internals reacted more constructively to frustration than externals and internals regarded obstacles as "surmountable" while externals regarded obstacles as "insurmountable."

In comparison, Glass (1977) showed that the Type A individuals responded initially to uncontrollable stress with "hyperresponsiveness" in attempt to assert control over the stressor. However, then the Type A individuals

found that they were unable to control the environmental stressor, they showed hyporesponsiveness or a learned helplessness. Glass (1977) also showed that this helpless feeling was greater in Type As than Bs. Thus, the Type A individual and the internal individual have been shown to respond initially to stress with efforts to overcome the stressor. Also, when it becomes obvious that the stressor cannot be controlled, the Type A individual will experience helplessness while the internal individual has a similar response when there is a threat to ego. The externals, in all but one study, were found to withdraw when exposed to stressors.

Glass (1977) in a study to examine the relationship between behavior patterns and personality variables, found that Type A individuals had a tendency to have higher expectations of environmental control than Type B individuals. Locus of control was measured by Rotter Internal-External Locus of Control Scale. The Jenkins Activity Survey was used to assess Type A behavior pattern. Glass (1977) asserted, however, that the magnitude of the coefficient was too small to warrant a firm conclusion ($\underline{r} = -.17$, $p < .01$).

Ledom (1979) investigated the relationship between locus of control and Type A behavior pattern. The sample

was comprised of 40 White males between the ages of 30 and 54 years. Locus of control was measured by the Nowicki-Strickland Internal-External Locus of Control Scale. The Bortner Short-Rating Scale was used to assess Type A and B behavior patterns. Univariate regression and covariant correlation were used to analyze the data. Ledom (1979) found that there was no significant relationship between locus of control and coronary-prone behavior ($r = -.03$, $F = .04$).

In summary, this review has supported the need for further investigation of locus of control and behavior patterns. Even though the two studies presented did not show a relationship between the two variables, there were similar results found between the characteristics of internally controlled individuals and Type A individuals. Perhaps, the instruments for measuring Type A behavior in the two studies may have affected the results.

Summary

This chapter presented a review of the literature related to Rotter's social learning theory and Friedman and Rosenman's Type A behavior theory. A thorough review of the association between Type A behavior and

coronary heart disease has shown that Type A individuals are at higher risks for developing coronary heart disease than Type B individuals. In reviewing the assessment of Type A behavior pattern, Friedman and Rosenman's Structured Interview Method has been shown to have the greatest reliability and validity than the other measures, but is less cost effective and more time-consuming. The review of psychosocial and occupational influence on Type A behavior pattern has shown that Type A behavior is greater in the White male with higher occupational and educational status, but that Type A behavior may be observed in any individual irrespective of race, educational, social, or occupational status. The review of methods of alleviating Type A behavior has shown promising results, but no firm conclusions can be made at this time.

Locus of control and achievement review have shown a consistent relationship between these two variables--the higher achievement level of the individual, the more internal is his/her orientation. The review of locus of control and Type A behavior pattern has not shown a relationship between Type A behavior and locus of control, but has shown some similar results between the characteristics of internally controlled individuals

and Type A individuals in terms of their responses to stress and achievement levels.

CHAPTER 3

PROCEDURE FOR COLLECTION AND TREATMENT OF DATA

The study undertaken to determine the relationship between locus of control and behavior patterns of cardiovascular patients was classified as an ex post facto descriptive correlational study. Descriptive studies are done primarily to obtain accurate and meaningful description of phenomena (Abdellah & Levine, 1979). Correlation is an index of the extent or magnitude to which variables are interrelated (Polit & Hungler, 1978). The aim of descriptive correlational studies is not to infer causal relationships but to describe existing relationships among variables (Polit & Hungler, 1978).

The variable of Type A and B behavior patterns of cardiovascular patients as measured by Friedman and Rosenman's Structured Interview was correlated with the variable of locus of control as measured by the Adult Nowicki-Strickland Locus of Control Scale. The use of the ex post facto design was supported by Polit and Hungler (1978) as some behavior variables inherently

do not lend themselves to manipulation, for instance, personality and medical diagnosis.

Setting

The setting for this study was the cardiovascular outpatient clinic of a 1,000-bed, publicly-funded hospital located in a southern metropolitan area. This hospital is considered a major teritary care facility and approximately 80-100 patients are seen per week in the cardiovascular outpatient clinic.

Population and Sample

The target population of this study was comprised of all cardiovascular outpatients of the selected hospital admitted with a previous medical diagnosis of myocardial infarction and/or angina pectoris. A convenience sample was acquired as potential subjects came into the clinic. A total of 52 subjects was approached. Twenty subjects refused to participate. The remaining 32 subjects who agreed to participate comprised the sample of the study. The subjects met the following criteria: (a) 18 years of age or older, (b) had been previously diagnosed with myocardial infarction or angina pectoris, and (c) was able to speak and understand English.

The convenience sampling method is the obtainment of subjects that are available at hand (Polit & Hungler, 1978). Although this form of nonprobability sampling is considered weak because of the lack of randomization, this shortcoming can be mitigated by careful selection of subjects (Kerlinger, 1973).

Protection of Human Subjects

Permission was obtained from the Human Subjects Review Committee of Texas Woman's University (Appendix A) and the agency used in the study (Appendix B) to conduct the research study. The permission from both institutions was acquired prior to data collection.

The subject was informed verbally with a written presentation of the purpose of the study and the nature of expected participation in the study (Appendix C). Each individual received information on the written consent form about the anonymity and confidentiality of his participation (Appendix D). Also the individual was informed that his participation in the study would not alter his care in any way, and that he may withdraw from the study at any time without penalty. Anonymity and confidentiality were assured by use of a coding system where no names were written on the questionnaire

or tape-recorded during the interview. The audiotape and questionnaires were destroyed after the interviewer had rated each subject. Neither the name of the individual nor the institution were mentioned in the reporting of findings; only group data were reported.

Instruments

Three instruments were used for data collection in this study. The first was the Demographic Data Questionnaire developed by the researcher (Appendix E). This questionnaire was used to gather information about age, sex, race, marital status, educational level, occupation, and social economic status of the sample. These data were used to describe the sample.

The second instrument, Friedman and Rosenman's Structured Interview, measured Type A and B behavior patterns (Appendix F). This instrument was developed at Harold Brunn Institute, a well-established cardio-vascular research laboratory, directed by Dr. Meyer Friedman. The judgment is dichotomous, either Type A or Type B. This interview relies on both content and overt behavioral style of the subject's responses to rate the behavior pattern as either Type A or Type B (Bortner & Rosenman, 1967). A score of 90 or above is judged as

Type A, 70 or less as Type B. The mean score for Type A individuals is 240.

The structured interview is a standardized clinical technique. The interviewer and rater must be trained to use the Structured Interview (Appendix G). The subject is asked approximately 25 questions regarding time urgency, competitiveness, and hostility. The scale for measuring these traits is divided into time urgency (T scale) and excess competitiveness and hostility (H scale). Under the T scale, the subject is scored according to psychomotor manifestations, direct behavioral tests, physiological indicators, and significant biographical content. The H scale is scored according to psychomotor manifestations, direct behavioral tests, and significant biographical content.

The interviewer deliberately phrases questions to create a stressful atmosphere for the subject. This condition is assumed to elicit signs of impatience, aggressiveness, and competitiveness (Friedman & Rosenman, 1974). The manner and tone in which the subject responds to the questions are considered more important than the content of responses in determining the individual's behavior pattern (Friedman & Rosenman, 1974). The interviews are tape-recorded for later assessment.

The Type A behavior pattern is shown by persons with impatience and a chronic sense of time urgency, competitiveness, aggressive drive, and often, hostility (Friedman & Rosenman, 1974). The Type B behavior pattern is characterized by little or no habitual sense of time urgency, competitiveness, or aggressive drive, and is generally an easy-going, patient individual (Friedman & Rosenman, 1974).

The reliability of this instrument has been adequately determined. At present, test-retest reliability has 80% agreement (Rosenman, 1978).

The validity of the Structured Interview has been established. This measurement generally does quantify Type A attributes (Rosenman, 1978). Concurrent validity has been obtained with significant correlations between the Jenkins Activity instrument for measuring Type A and the Structured Interview (Dembroski, Caffrey, Jenkins, Rosenman, Spielberger, & Tasto, 1978). The Structured Interview has been shown to have construct validity by Glass (1977). Glass (1977) demonstrated that Type A subjects are more aggresisve, more time urgent, more impatient, and more hard-driving than Type B individuals when appropriate environmental challenges were present.

The Structured Interview instrument has been widely used for the purpose of identifying Type A and B behaviors. Reliability comparable to many accepted medical diagnostic procedures has been awarded to this instrument (Jenkins, Rosenman, & Zyzanski, 1974). The Structured Interview is considered the strongest method of predicting future coronary heart disease; it is the first purely behavioral method in the history of medicine to be successful in predicting the future emergency of a somatic disease (Dembroski et al., 1978).

The third instrument that was used in the study was the Nowicki-Strickland Internal-External Control Scale (Appendix H). This scale consists of 40 questions which are to be answered either yes or no. The scale is scored in the external direction with scores ranging from 0 to 40. The higher the score the more externally controlled is the individual.

This instrument was developed from the Children Nowicki-Strickland Internal-External Control Scale. Nowicki and his associates (Nowicki & Duke, 1974) saw a need for the development of a scale that could be used to measure locus of control for individuals with a variety of educational backgrounds. The Rotter's Internal-External Scale had been shown to relate to social

desirability and to possess language only appropriate for college-educated adults (Nowicki & Duke, 1974). Thus, the Children Nowicki-Strickland Internal-External Control Scale was developed. The Adult Nowicki-Strickland Internal-External Control Scale was then easily devised from the Children Nowicki-Strickland Internal-External Scale by making such substitutions as "people" instead of "children" (Nowicki & Duke, 1974). These alterations made the scale more appropriate for adults.

Reliability for the Adult Nowicki-Strickland Internal-External Control Scale has been established. Data from different studies suggested that this scale had split-half reliability and test-retest reliability. Split-half reliability ranged from .74 to .86, N = 158. Test-retest reliability over a 6-week period revealed r = .83, N = 48 (Nowicki & Duke, 1974).

Validity has also been ascertained for the Adult Nowicki-Strickland Internal-External Control Scale. Construct validity has been established with significant positive correlations between this scale and Rotter's scale (r = .68, df = .47, p < .01; r = .48, df = 37, p < .01) (Nowicki, 1973). This validity was confirmed by administration of both scales (Nowicki-Strickland

and Rotter) to two college and adult community adult samples.

Discriminative validity was also obtained for this instrument. Nowicki and Duke (1974) found that the adult scores were not related to scores from the Marlowe-Crown Social Desirability Scale (r = .10, df = 47; r = .06, df = 67) (Nowicki, 1973).

The Nowicki-Strickland Internal-External Control Scale was chosen for use in this study because the target population was comprised of individuals with lower educational levels. Therefore, this instrument furnished more reliable data than other scales of locus of control.

Data Collection

Patients were interviewed in the outpatient setting after permission had been obtained from the university, agency, and the individual subject. The purpose and nature of the study were explained to the patient through a verbal presentation and written consent obtained.

On the day before the cardiac clinic met, all charts of cardiovascular patients were reviewed to validate the previous medical diagnosis of angina pectoris or myocardial infarction. On the day of the clinic, these

patients were asked to participate in the study as they arrived for their appointments. The agreeing participants were interviewed. In an attempt to minimize bias, the researcher alternated the sequence of administration of Friedman and Rosenman's Structured Interview and the Adult Nowicki-Strickland Locus of Control with each successive subject. The investigator audiotaped all interviews using a stereo cassette tape-recorder with a microphone hung from the subject's neck. All tapings were done in private in the head nurse's office at the clinic. According to set protocol, subjects were to be asked to refrain from smoking during the Structured Interview to allow for free movement of hands. Since the setting for the interview was in a no-smoking area, none of the subjects was asked to refrain from smoking.

The psychomotor manifestations and physiological indicators of the Type A tool that cannot be observed through listening to the audiotape were assessed during the interview. These observations included (a) characteristic facial tautness, (b) rapid eye blinking, (c) knee jiggling, (d) head nodding when speaking, (e) tense posture, (f) motorization accompanying responses, (g) rapid body movements, (i) periorbital pigmentation,

(j) forehead and upper lip perspiration, (k) cold, wet hands, (l) characteristic facial set exhibiting aggressive and hostility, (m) characteristic tic-like drawing back of corner of lips, and (n) use of clenched fist or forceful use of hands and fingers. All other indicators were assessed later from the audiotape. The entire interview took approximately 30 minutes. All interviews and assessments of Type A and B behavior patterns were done by the investigator of the study who was trained in the Structured Interview technique. Each participant was thanked and given the opportunity to ask questions at the end of the interview.

Treatment of Data

Descriptive statistics and frequency counts were used to analyze the demographic data. The Pearson product-moment correlation statistical test was used to test the first hypothesis: There is no significant relationship between the locus of control scores and Type A and B behavior pattern scores of cardiovascular patients. This particular statistical test was used to measure the degree of correlation between the variables of locus of control and behavior patterns. The degree of correlation was indicated by the size of the correlation

coefficient, r. Correlational statistics are used when the amount of relationship between two variables is sought, not a causal relationship (Elzey, 1974). The null hypothesis was rejected if the relationship between the two variables of behavior patterns and locus of control was significant. Otherwise, the null hypothesis was accepted with a significance level of $p = .05$.

A t-test for independent samples was used to test the second hypothesis: There is no significant difference in the locus of control scores of Type A and B individuals. The data obtained from the Structured Interview and the Adult Nowicki-Strickland Internal-External Control Scale were analyzed using this t-test. The t-test was used to determine if there was a significant difference in the mean response of two groups who are treated alike except for the two factors under investigation (Knapp, 1978). This t-test was used in this study even though unequal sample sizes of the two groups were expected. If the difference of the means of locus of control scores of the Type A and B subjects was significant, then the null hypothesis was rejected. Otherwise, the null hypothesis was accepted with a significance level of $p = .05$.

CHAPTER 4

ANALYSIS OF DATA

A descriptive correlational study was conducted to determine the relationship between locus of control and behavior patterns of cardiovascular patients. The Nowicki-Strickland Internal-External Control Scale was used to measure locus of control and Friedman and Rosenman's Structured Interview to determine Type A and B behavior patterns. The Demographic Data Questionnaire developed by the researcher was employed to describe the sample. This chapter presents an analysis and interpretation of the data followed by a summary of the findings.

Description of Sample

The demographic data collected were age, sex, race, marital status, education, occupation, and social economic status. The sample included 18 males (56%) and 14 females (44%), for a total of 32 subjects.

Distribution of subjects by age and race fell into the following groups. One (3%) person was in the 25-44 age group; 23 (72%) were in the 45-65 age group; and

8 (25%) were in the over 65 age group. Thirteen (41%) were Black and 19 (59%) were White.

The findings regarding marital status were 14 (44%) were married. Seven (22%) of the subjects were divorced; seven (22%) were widowed; two (6%) were separated; and two (6%) were single.

Aligned to occupation, one (3%) subject was a professional; two (6%) subjects were unemployed. The other subjects were retired on disability with 22 (69%) retired laborers and seven (22%) retired managers.

The findings regarding educational level were seven (22%) in the 0-6th grade group and 19 (60%) in the 7-12th grade group. There were three (9%) subjects with a high school education and three (9%) subjects with a college education.

The final demographic category was social economic status. There were 26 (81%) subjects with earnings less than $5,000 per year, five (6%) subjects with earnings between $5,000-$10,000 per year, and one person (3%) with an income between $10,000-$20,000 per year.

The sample of 32 subjects was comprised of 27 (85%) Type A individuals and five (15%) Type B individuals. The mean score on the structured interview for the

entire group was 192.8, and the mean Nowicki-Strickland Locus of Control Score was 14.3 for the sample.

Findings

The Pearson product-moment correlational analysis was used to test the first hypothesis: There is no significant relationship between the locus of control scores and the Type A and B behavior pattern scores of cardiovascular patients. This hypothesis was accepted (r = .29, p = .106) (see Table 1). To determine the significance of r, an F value was determined. Analysis of data revealed that there was no significant relationship between the variables of locus of control and behavior patterns.

Table 1

Relationship between Locus of Control Scores and Behavior Pattern Scores of Cardiovascular Patients

Source	SS	df	MS	F
Regression between locus of control and behavior pattern	25,855.3	1	25,855.29	2.77
Error	279,816.6	30	9,327.22	
Total	305,671.9	31	35,182.51	

r = .29, p = .106.

For testing the second hypothesis, the t-test was used: There is no significant difference in the locus of control scores for the Type A and B individuals with coronary heart disease. The null hypothesis was accepted (t (30) = 1.73, p = .094) (see Table 2). Analysis of the data revealed there was no significant difference between the locus of control for the Type A and B individuals.

Table 2

Difference between Locus of Control Scores and Behavior Pattern Scores of Cardiovascular Patients

Locus of Control	Type A n = 27	Type B n = 5
Mean	15.07	10.80
Standard deviation	4.89	6.14
Number	27	5

N = 32.

t (30) = 1.73, p = 0.94.

Additional Findings

The scores for the Structured Interview ranged from 110 to 375 for the Type A individuals with a mean score of 2.27 and standard deviation of 80. The scores for the

T- scale ranged from 90 to 285 with a mean of 185 and a standard deviation of 52. The H-scale scores for the Type A individuals ranged from 0 to 130 with a mean score of 41 and a standard deviation of 5 (see Table 3).

Table 3

Mean, Standard Deviation, and Range of Nowicki-Strickland and Structured Interview Scores for Type A Group

	Mean	Standard Deviation	Range
T-Scale	185	52	90 - 285
H-Scale	41	52	0 - 130
Total Score	227	80	110 - 375
Locus of Control Score	15	5	8 - 25

N = 27.

For the Type B individuals, the scores ranged from 35 to 65 with the mean score 47 and a standard deviation of 11. The scores on the T-scale ranged from 25 to 65 with a mean score of 43 with a standard deviation of 14. The H-scale scores ranged from 0 to 20 with a mean score of 4 and standard deviation of 9 (see Table 4).

The mean locus of control score for the Type A group was 15 with a standard deviation of 5, and for the

Table 4

Mean, Standard Deviation, and Range of Nowicki-Strickland and Structured Interview Scores for Type B Group

	Mean	Standard Deviation	Range
T-Scale	43	14	25 - 65
H-Scale	4	9	0 - 20
Total Score	47	11	35 - 65
Locus of Control Score	11	6	2 - 17

N = 5.

Type B group the mean locus of control score was 11 with a standard deviation of 6. The scores on the locus of control scale for the Type A individuals ranged from 8 to 25. The locus of control scores for the Type B individuals ranged from 2 to 17 (see Tables 3 and 4).

In further analysis of data using multiple regression analysis, it was found that locus of control was significantly related to age, hostility (H-scale score), and the retired laborer ($R = .58$, $p < .008$). The R coefficient ($R = .58$) measures the extent of association between the independent variables and the locus of control score. This correlation coefficient indicates a positive association or direction between the values of 0 and 1.

Therefore, the higher the age category, the higher the hostility score; and if the individual was a retired laborer, the more likely is the individual to be externally oriented (see Table 5). The age category was the most important contributor to explaining the locus of control score, followed by the hostility score, then retired laborer score.

Table 5

Locus of Control Correlated with Age, Hostility, and Retired Laborers

	SS	df	MS	F
Locus of Control	1,283.9	3	95.96	4.7824
Error	561.8	28	20.06	
Total	1,845.7	31	116.02	

$R = .58$, $p < .008$.

In addition, it was found that the variables of age, hostility, and retired laborers in combination were useful in explaining the variable of locus of control score. Thirty-four per cent of the variability that occurs in the locus of control score can be explained by age category, hostility score, and retired laborer status.

Summary of Findings

This study accepted the two null hypotheses:

1. There was no significant relationship between the locus of control scores and the behavior patterns of Type A and B scores of cardiovascular patients.

2. There was no significant difference in the locus of control scores for Type A and B individuals with coronary heart disease.

In addition, this study found that 34% of the variance of locus of control can be explained by age, hostility score, and retired laborer status.

CHAPTER 5

SUMMARY OF THE STUDY

This investigation was conducted to determine if there was a relationship between the locus of control and behavior patterns of cardiovascular patients. Two hypotheses were tested and accepted as stated: (a) There is no significant relationship between the locus of control scores and the Type A and B behavior pattern scores of cardiovascular patients and (b) There is no significant difference in the locus of control scores of the Types A and B individuals with coronary heart disease.

A summary of the study, its findings, and conclusions are discussed in this chapter. Also included are implications for nursing and recommendations for further research.

Summary

Two questions were examined in this study: Is there a relationship between cardiovascular patients with Type A and B behavior patterns and their locus of control? Is there a difference in the locus of control of Types A and B individuals? Literature was reviewed

in relation to these two questions. The conceptual framework was formulated based on Friedman and Rosenman's Type A behavior theory and Rotter's social learning theory.

A sample of 32 cardiovascular outpatients with the medical diagnosis of status: postmyocardial infarction or unstable angina was selected by the convenience method. This sample was drawn from a large cardiovascular outpatient clinic of a publicly-funded hospital in a vastly populated southern metropolitan area. Each participant was interviewed using the Friedman and Rosenman's Structured Interview to measure behavior patterns and the Nowicki-Strickland Locus of Control Scale to measure locus of control. Also included in the interview was a Demographic Data Questionnaire to describe the sample. All aspects of the interview were tape recorded.

The investigator found that there was no relationship between locus of control and Types A and B behavior patterns (r = .29, p = .10). Also, it was found that there was no difference between locus of control of Type A and B individuals with coronary heart disease (t (30) = 1.73, p = .094). Additional findings revealed

that 34% of the variance of locus of control can be explained by age, hostility score, and retired laborer status (R = .58, p < .008).

Discussion of Findings

The conceptual framework of the study was not supported as both hypotheses stated in the null were accepted. One reason for the nonsignificant results might have been the small number of subjects in the Type B group (N = 5).

However, the findings of the present study did support Ledom's (1979) previous study in which he also found no significant relationship between locus of control and cardiovascular behavior patterns. The mean locus of control score for the entire sample of Ledom's (1979) study was 8.25, which indicates that his sample was internally oriented. For the present study, the mean locus of control score was 14.3. While this mean score is much higher than Ledom's (1979) mean, both scores are considered indicative of an internal locus of control orientation.

One reason for the difference in the means of the locus of control scores is the difference in the sample distribution. For example, Ledom's (1979)

sample was comprised only of White males while the sample of the present study was comprised of 56% males and 44% females; 41% Blacks and 59% Whites. According to Nowicki (1973), Blacks are more likely to be externally oriented than Whites. There have not been any consistent findings relating sex to locus of control.

Another factor which may help to explain the difference in the mean locus of control scores of Ledom's (1979) study and the present study is the difference in the distribution of occupation of the two samples. Eighty-seven percent of the subjects in the present study were not working while all the subjects were employed on a full-time basis in Ledom's study. Also, 81% of the subjects in the present study received less than $5,000 per year. According to Battle and Rotter (1963), the socioeconomic class of individuals is inversely related to locus of control--the lower the socioeconomic class of the individual, the more externally oriented the person.

Another difference between the two samples which may help to explain the difference in the mean locus of control scores was the age of the sample. For the present study, 72% of the subjects were 45-65 years old and 25% over 65. The subjects in Ledom's (1979)

study were between the ages of 30 and 54 years. Therefore, the present study was comprised of older subjects. It has been found that the older the adult subjects, the more external they are (Nowicki, 1973). This finding was supported by the present study where age category was related to locus of control--the older the individual, the more externally oriented.

Even though the two hypotheses tested in the present study did not meet a statistical level of significance, there was a tendency toward a positive correlation between the locus of control and behavior patterns of cardiovascular patients. This tendency was also found by Glass (1977). In both cases, this trend leaned toward the higher the Type A score, the more external the individual.

This trend may be explained by one of the additional findings of the present study--the higher the hostility score on the Type A scale, the more external the individual. This finding has been supported by previous studies in which hostility was related to the externally oriented individual (Clouser & Hjelle, 1970; Miller & Minton, 1969; Williams & Vantress, 1969).

Furthermore, these three studies suggested that externals tended to be less trustful and more suspicious

of other people than internals (Clouser & Hjelle, 1970; Miller & Minton, 1969; Williams & Vantress, 1969). This distrust of altruism is also a component of the hostility scale of Friedman and Rosenman's Structured Interview which lends further support to the findings of the present study.

It should be mentioned, however, that Rotter's Locus of Control Scale was used for measuring locus of control in the above three studies, which related hostility and distrust of altruism to locus of control. This scale has been found to be more instrumental in factoring political influence as an exertion of external control (Kaemmerer & Schwebel, 1976). It is an assumption rather than a supported finding that Type A individuals are more likely to have an external orientation as a function of political influence rather than other outside forces. Therefore, Rotter's Locus of Control Scale may have been more useful in measuring locus of control for the present study.

Conclusions and Implications

The following conclusions were made by the investigator, but cannot be generalized beyond this sample because of the limitations of this study.

1. Locus of control is individualized for each cardiovascular patient and not related to behavior patterns.

2. As presented in the conceptual framework, the relationship of behavior patterns and locus of control was not supported in this study.

As a result of the outcome of this study, the following implications for nursing are suggested. In planning teaching strategies for cardiovascular patients, nurses need to take into consideration

1. Locus of control orientation cannot be explained by Type A or B behavior pattern.

2. The patients who are retired laborers, are older, and who manifest hostility are likely to be externally controlled.

Recommendations for Further Study

The following recommendations have been logically derived from this study.

1. A similar study be replicated utilizing both Nowicki-Strickland's and Rotter's Locus of Control Scales to measure locus of control to determine which scale is most useful for measuring locus of control in Type A individuals.

2. A similar study be replicated using larger samples to include a more equal distribution of demographic characteristics within the two groups.

3. A prospective study be launched to further investigate the relationship between the hostility component of the Type A behavior pattern, locus of control, and the development of coronary heart disease.

4. A study be conducted to determine the most effective and efficient methods for determining Type A behavior pattern and locus of control by nurses in assessing cardiovascular patients in a clinical setting.

APPENDIX A

TEXAS WOMAN'S UNIVERSITY
Box 23717, TWU Station
Denton, Texas 76204

1810 Inwood Road
Dallas Inwood Campus

HUMAN SUBJECTS REVIEW COMMITTEE

Name of Investigator: Verdell Marsh Center: Dallas

Address: 8218 Park Lane #105 Date: 12/11/80

Dallas, Texas 75231

Dear Ms. Marsh:

Your study entitled Behavior Patterns of Cardiovascular Patients and Locus of Control

has been reviewed by a committee of the Human Subjects Review Committee and it appears to meet our requirements in regard to protection of the individual's rights.

Please be reminded that both the University and the Department of Health, Education, and Welfare regulations typically require that signatures indicating informed consent be obtained from all human subjects in your studies. These are to be filed with the Human Subjects Review Committee. Any exception to this requirement is noted below. Furthermore, according to DHEW regulations, another review by the Committee is required if your project changes.

Any special provisions pertaining to your study are noted below:

____ Add to informed consent form: No medical service or compensation is provided to subjects by the University as a result of injury from participation in research.

____ Add to informed consent form: I UNDERSTAND THAT THE RETURN OF MY QUESTIONNAIRE CONSTITUTES MY INFORMED CONSENT TO ACT AS A SUBJECT IN THIS RESEARCH.

____The filing of signatures of subjects with the Human Subjects Review Committee is not required.

__X__Other: With modification. Present a plan to the committee chairman for inclusion in your application whereby you provide for the safekeeping of the tapes, protection of anonymity and time and type of eventual disposition of the tapes. In your verbal explanation, use layman's language and explain "reporting data as group" more clearly.

____No special provisions apply.

Sincerely,

Estelle D. Kurtz

Chairman, Human Subjects Review Committee

at , Dallas

PK/smu/3/7/80

APPENDIX B

TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING

AGENCY PERMISSION FOR CONDUCTING STUDY*

THE Parkland Memorial Hospital

GRANTS TO Verdell Marsh
a student enrolled in a program of nursing leading to a Master's Degree at Texas Woman's University, the privilege of its facilities in order to study the following problem.

Is there a relationship between cardiovascular patients with Type A and B behavior patterns and their locus of control?

Is there a difference in the locus of control of Type A and B individuals?

The conditions mutually agreed upon are as follows:

1. The agency (may) (~~may not~~) be identified in the final report.
2. The names of consultative or administrative personnel in the agency (may) (~~may not~~) be identified in the final report.
3. The agency (~~wants~~) (does not want) a conference with the student when the report is completed.
4. The agency is (willing) (~~unwilling~~) to allow the completed report to be circulated through interlibrary loan.
5. Other _____

_____

Dissertation/Theses signature page is here.

To protect individuals we have covered their signatures.

APPENDIX C

ORAL PRESENTATION TO SUBJECTS

My name is Verdell Marsh. I am a registered nurse and a graduate student at Texas Woman's University. I am conducting a research study, and would appreciate your help as a participant in this study.

The purpose of this study is to determine if there is any relationship between the way heart patients behave in everyday life and what they believe is responsible for what happens to them throughout their lives. By determining if these two factors are related, more insight can be gained into the best way to teach heart patients so that they can learn more about their conditions and how to care for themselves.

You will be asked several questions related to the way you act in certain situations. Also questions will be asked whether you believe you are able to accomplish your goals because of your own actions or because of the actions of other people or other things. Also you will be asked questions about such things as your age range, marital status, occupation, and years completed in school. We should be able to complete the interview in about 30 minutes.

If you decide to take part in the study, you will be asked to sign a written consent form agreeing to participate in the study and relieving the Texas Woman's University of any liabilities incurred. If you have any questions about this study, please feel free to ask me. No names will be placed on the questionnaires or tape recording. I will keep the tapes and questionnaires in a locked file cabinet in my home. Neither your name nor the name of the hospital will be given in reporting information obtained from this study. Your care will not be affected if you do or do not decide to participate in the study. If at anytime you may want to withdraw from the study after giving your written permission, please feel free to do so without fear of penalty.

I hope you plan to be a part of this study. Thank you for your consideration.

APPENDIX D

Consent Form

TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING

Consent to Act as a Subject for Research and Investigation;

The following information is to be read to or read by the subject. One copy of this form, signed and witnessed, must be given to each subject. A second copy must be retained by the investigator for filing with the Chairman of the Human Subjects Review Committee. A third copy may be made for the investigator's files.

1. I hereby authorize Verdell Marsh to perform procedure of investigation.

   This is a study to determine if there is a relationship between the locus of control and behavior patterns of heart patients and to determine if there is a difference between the locus of control of Type A and B heart patients. You will be asked questions from three instruments: structured interview, locus of control scale, and a demographic data form. Your responses will be tape recorded with a cassette tape recorder. A microphone will be hung from your neck to increase clarity of your voice. Some responses may be checked on the instrument during the interview. There are no right or wrong answers. You are asked to respond according to your own belief. The entire interview should last no longer than 30 minutes.

2. The procedure or investigation listed in Paragraph 1 has been explained to me by Verdell Marsh.

3. (a) I understand that the procedures or investigations described in Paragraph 1 involve the following possible risks or discomforts:

   (1) There is a remote possibility of improper release of data. The use of a code system with numbers instead of names will be used to insure anonymity and confidentiality. The reporting of group findings instead of individual data will be used to reduce the risk of public embarrassment as the result of improper release of data.

(2) Stress and fatigue may result from the interview. The interviewer will be available to answer questions and listen to your concerns to alleviate stress. At anytime you feel tired or feel any discomfort, the interview will be stopped.

(b) I understand that the procedures and investigations described in Paragraph 1 have the following potential benefits to myself and/or others.

To make a contribution to research by investigating the relationship between behavior patterns and locus of control of heart patients in an attempt to improve teaching strategies which may result in an increase in the patient's knowledge of his disease process, treatment, and rehabilitation.

(c) I understand that--No medical service or compensation is provided to subjects by the university as a result of injury from participation in research.

4. An offer to answer all of my questions regarding the study has been made. If alternative procedures are more advantageous to me, they have been explained. I understand that I may terminate my participation in the study at any time.

_____ _____

Subject's Signature Date

APPENDIX E

DEMOGRAPHIC DATA

Age: _____18-24 _____ 25-44 _____45-65 _____ Over 65

Sex: _____Male _____ Female

Race: _____ White _____ Black

Marital Status: _____ Married _____ Single _____ Widow

_____ Divorced _____ Separated

Occupation:_____

Educational level:

_____ 0-6th grade

_____ 7th-12th grade

_____ High school

_____ College

_____ Advanced degrees

Social economic status:

_____ Less than $5,000

_____ $5,000-$10,000

_____$10,000-$20,000

_____$20,000 and over

APPENDIX F

RECURRENT CORONARY PREVENTION PROJECT
MOUNT ZION HOSPITAL AND MEDICAL CENTER
MAILING ADDRESS: P.O. BOX 7921
SAN FRANCISCO, CALIFORNIA 94120
(415) 922-8155

At present, we are employing a videotaped structured interview for the detection and quantitative assessment of Type A Behavior. This technique appears to be far more sensitive than any methodology previously employed.

Recently we have received a number of requests from professional personnel throughout the country concerning the possibility of receiving instruction in this technique. Because of these requests, I have asked Ms. Nancy Fleischmann, the chief independent behavior rater of our present research project, if she would consent to give a short diagnostic course to any visiting personnel on her own time. She has agreed. After consultation with me, we both have decided that approximately eight hours of instruction by her should be sufficient to teach the essentials of performing the interview and quantitatively assessing the severity of the Type A Behavior that might be present. I have asked her to receive (as her own private fee) $200.00 per student, with an additional $25.00 per hour if more than eight hours are needed. She, of course, will employ our presently completed videotaped interviews as her teaching aides.

If you are interested in receiving this instruction, you should write to Ms. Fleischmann; c/o Recurrent Coronary Prevention Project; Mount Zion Hospital and Medical Center; P.O. Box 7921; San Francisco, CA 94120 or telephone her directly (415) 647-7421.

Since she has served as an interviewer with us since 1961, I believe I can truthfully rate her as the best instructor in this country for the detection of Type A Behavior.

Meyer Friedman, M.D.
Director
Recurrent Coronary Prevention Project

APPENDIX G

RECURRENT CORONARY PREVENTION PROJECT
MOUNT ZION HOSPITAL AND MEDICAL CENTER
MAILING ADDRESS P.O. BOX 7921
SAN FRANCISCO, CALIFORNIA 94120

(415) 922-8155

June 11, 1980

Recieved from Verdell Marsh $200.00

for training in the determination of

Type A characteristics.

APPENDIX H

The Adult Nowicki-Strickland Internal-External Locus of Control Scale is available from Stephen Nowicki, Jr., Department of Psychology, Emory University, Atlanta, Georgia 30322.

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