

STRESS AND THE CORONARY-PRONE BEHAVIOR PATTERN
IN WORKING WOMEN

by

Debra Ann Weaver


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
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APPROVED:

 L.W. Frederiksen, Chairman

 G.A. Elum

G. Colmano

R.M. Eisler

Elise E. Labbe'

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Committee Chairman: Lee W. Frederiksen

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(ABSTRACT)

Although the Type A behavior pattern (TABP) is firmly established as a risk factor for coronary heart disease, it is neither well understood from a psychological perspective nor is it well understood in women. The present study attempts to describe the TABP in a population of working women. The description is based both on physiological and psychological measures.

Ninety-four women were chosen from an original population of 157 women from the Roanoke and Blacksburg, Virginia areas. Each of these women completed the following psychometric instruments: Jenkins Activity Survey(JAS), Framingham Type A Scale, Novaco Anger Inventory, Bem Sex Role Inventory(BSRI), and Perceived Work Environment(PWE). In addition, a blood sample was obtained from each person.

The results revealed several personality differences between Type A and Type B women. Type As scored significantly higher on the three descriptive scales of the

JAS than did TBs. The Type A women also had significantly higher total anger scores on the Novaco. A priori analysis of the types of items comprising the Novaco revealed that Type As were aroused to situations threatening them personally or their possessions while Type Bs were aroused by situations involving prejudices or injustices to others.

Analysis of the BSRI showed Type As to have endorsed significantly more masculine characteristics and fewer feminine characteristics than did Type Bs. Type As also responded in a more socially desirable direction.

Three of the PWE factors were found to be significantly different between Type A and Type B women. These factors were task characteristics, co-workers, and pressure to produce. These differences reflect perceptions of the environment. Significant interactions between Type A and the environment were seen in the administrative group indicating that certain environments influence the Type A's perceptions.

The physiological assessment was not significant. However, there was a strong trend evident that approached significance. The model was able to correctly classify approximately 78% of the population and there were observable differences between the Type A. Results indicated that Type As displayed characteristics of a stressed population such as increased corticosteroids,

ceruloplasmin, and proteins along with decreased levels of glucose, ascorbic acid, and oxidation- reduction protein.

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Finally, I wish to acknowledge the most important contribution of and dedicate this dissertation to my parents, . Their unconditional support and confidence provided me with the motivation to begin and the incentive to finish.

PREFACE

Before one can appreciate the research reported within it is necessary to have an understanding of the coronary-prone behavior pattern as a whole. The coronary-prone behavior pattern in a highly complex interaction of many factors. Not everyone's understanding of this behavior pattern will be as thorough as the next. Therefore, the purpose of the review is to provide the background information necessary for those individuals to understand the many dimensions of the coronary-prone behavior pattern.

In order to fully explain this behavior pattern many areas had to be integrated. While some of those sections do not pertain directly to the research reported herein, they are certainly pertinent to the description of the behavior pattern and necessary to provide the total picture of the behavior pattern. A description of the overall behavior pattern is important as a conceptual and theoretical basis for this research. However, there are certain sections of this review that pertain more directly to the research questions posed. These include the mechanisms section and the section on sex differences. The reader may want to pay particular attention to these sections.

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INDEX TO ABBREVIATIONS

BP--blood pressure
CAD--coronary artery disease
Ch--cholesterol
CHD--coronary heart disease
CPBP--coronary-prone behavior pattern
CVD--cardiovascular disease
DBP--diastolic blood pressure
EP--epinephrine (adrenalin)
FFA--free fatty acids
HR--heart rate
IHD--ischemic heart disease
JAS--Jenkins Activity Survey
MI--myocardial infarction
NE--norepinephrine (noradrenalin)
SBP--systolic blood pressure
SI--structured interview
TA--Type A
TABP--Type A behavior pattern
TB--Type B
TG--triglycerides
URI--upper respiratory infection
WCGS--Western Collaborative Group Study

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CHAPTER 1

LITERATURE REVIEW

1.A INTRODUCTION: THE CORONARY-PRONE BEHAVIOR PATTERN AND CORONARY DISEASE

Approximately 30,000,000 Americans have some form of heart and blood vessel disease. Of this number, about 1,000,000 suffered a heart attack during 1978 and 65% of those died. Cardiovascular diseases (CVD) killed approximately 1,003,000 persons in 1978 which accounted for 52% of all deaths in the United States (American Heart Association, 1978).

The main concern to physicians, cardiologists, and epidemiologists is the fact that these statistics do not reflect a steady state phenomenon. Instead, they represent current outcomes of a problem which has been intensifying since the 1920's. The increase in mortality rates due to coronary heart disease (CHD) has greatly exceeded population increases (Anderson, 1973). Furthermore, the magnitude of this increase cannot be associated with comparable changes

in traditional coronary risk factors e.g., aging, sex (being male rather than female), hypertension, diabetes mellitus, parental history of heart disease, obesity, physical activity, elevated levels of cholesterol(Ch) and related fats in blood, and smoking. This fact has caused many investigators to look elsewhere for CHD precursors. As a result, a number of researchers have suggested a variety of psychological variables in the etiology of CHD (see Epstein, 1965; Hasin, Eisenberg, Friedlander, Lewis, & Gotsman, 1979; Haynes, Feinleib, & Kannel, 1980; Jenkins, 1976).

The fact that psychological factors may play a role in a physical illness is neither new nor a radical idea. The suggestion that psychological variables may be contributors to CHD, however, has not been universally accepted. One obvious reason for this is the fact that a great deal is known regarding both the CHD precursors (coronary artery disease, for example) and the causes of these conditions (i.e., elevated cholesterol). In addition, there are many non-psychological factors to explain these precursors and their causes.

Nevertheless, psychological variables do belong in any model purporting to provide a complete picture of CHD factors. As Jenkins, and Zyzanski (1980) have pointed out, the best combinations of the standard physical risk factors account for only a minority of new CHD cases. Furthermore,

for every CHD person possessing the right combination of risk factors, many non-CHD persons with the same combination can be found. In recent years, a growing body of literature provides data which suggest an association if not causal role for psychological factors. This research indicates that not only are these variables measurable, but that they may be valid indications and populations. It is also possible to delineate, to some extent, the mechanisms by which these factors cause changes in the cardiovascular system (Jenkins, 1976).

The purpose of this review is to examine one such psychological variable, the so-called coronary-prone behavior pattern (CPBP). This review is organized into ten major sections: "Effects of psychological stress on CHD," "Historical overview," "Description and assessment of the CPBP," "CPBP and personality variables," "Association of the CPBP and CHD," "Mechanisms linking behavioral and pathophysiological processes," "Conceptualization of the CPBP," "Developmental and cultural considerations," "Sex differences and the CPBP," "Intervention: Management and alteration of the CPBP."

Before beginning the discussion of the Type A behavior pattern (TABP), it is important to discuss psychological stress and its effects on CHD. Psychological stress is an important factor in CHD and is intrinsically related to the

TABP. Psychological stress refers to affective, behavioral, and physiological responses to aversive stimuli in the environment. A great many environmental events, or stressors, are capable of producing stress responses. In addition, it is known that the induction of the stress response is mediated by cognitive factors. As we move up the phylogenetic scale, stress reactions become less dependent on the stimulus itself and more dependent on associated cues that symbolize the consequences of these stimuli. Because of this, I prefer to follow Lazarus (1966) when speaking of psychological stress as the threat or anticipation of future harm, whether that harm is physical or psychological.

When confronted by any range of environmental events, the individual first engages in perceptual-cognitive activity designed to appraise the event as to the degree of threat. The stress response occurs if the stimulus is appraised as threatening, at which point the individual begins to mobilize his resources in an effort to reduce or eliminate the effects of the stressor.

The overall process of primary appraisal (i.e., threat evaluation) and secondary appraisal (i.e., coping) is much more complex than presented above, since it involves a number of servomechanisms in which stress responses act upon the cognitive appraisal processes and thus affect their

outcomes. For our purposes, we need not go into such complexities; it is enough to emphasize that the central concept in the definition of stress is perceived threat and its attendant coping processes. It should be noted that primary threat appraisal depends on two general classes of factors: (1) factors in the stimulus and its context, including the likelihood of harmful confrontation, and, especially, perception of the stimulus as potentially controllable or uncontrollable; (2) factors within the individual, including his intellectual resources, coping strategies, and related personality predispositions. These same factors, along with the degree of threat, determine the coping processes used by the individual to reduce or eliminate the anticipated harm.

1.B EFFECTS OF PSYCHOLOGICAL STRESS ON CHD

Three general classes of psychological stressors have been studied in connection with CHD: (1) general dissatisfaction with various aspects of life; (2) chronic or relatively long-term life events, defined by the individual (as well as the culture) as stressful; and acute or relatively short-term stressful events (Glass, 1977c). While the separation of these classes is artificial, it is convenient to draw distinctions for clarification purposes.

1.B.1 (1) Life Dissatisfactions

Stressful life events such as job dissatisfactions, economic frustrations, and excessive work and responsibility, all appear to be related to the risk of CHD (Jenkins, 1976). Unhappiness in nonoccupational areas such as marital and family relations along with an inability to derive satisfaction from leisure activities have also been correlated with CHD (Wolf, 1969).

Despite the consistent pattern of results obtained in the dissatisfaction research, a word of caution must be introduced. The findings are almost entirely retrospective and could result from a tendency among individuals with CHD to be more critical of their life circumstances.

1.B.2 (2) Chronic Stress

Suggestions have been made that when excessive work and responsibility approaches the limits of the individual's capacity of control, it will precipitate the development of CHD. Evidence to support this comes from epidemiologic research, most of which is reviewed by Jenkins (1976). Additional documentation for the association between occupational stress and CHD can be found in more focused studies of job stressors and CHD. These will be reviewed in detail in a later section, therefore, a few examples will suffice here. French, Rogers, and Cobb (1974) have found

that feelings of work overload are related to elevated serum Ch. Work overload refers to feelings that the demands of the job are beyond the individual's control. House (1974) reviews a number of other studies that support the work of French et al., (1974). The review also cites studies (like excess overtime) and actual CHD (Theorell & Rahe, 1971). Thus, there is evidence that chronic life stressors play a significant role in increasing the risk of CHD.

1.B.3 (3) Acute Stress

Death of a close relative or spouse has been correlated with the subsequent onset of cardiac disorders (Parkes, Benjamin, & Fitzgerald, 1969). Rejection by a loved one or sudden loss in self-esteem sometimes precede an acute myocardial infarction (MI) (Engel, 1970). Along a slightly different line, Brenner (1971) shows that abrupt economic downturns are associated with increased mortality from heart disease and that, conversely, heart disease mortality declines with economic upturns. Holmes and Rahe (1967) have developed an objective instrument for measuring a variety of such stressful life events in an individual's immediate and past environment. This instrument is called the Social Readjustment Scale and has become increasingly popular with investigators of the TABP.

It is suggested that the simple total of stressful events during a given time period is less critical in predicting CHD than the significance of these events for the individual. If one follows the earlier definition of psychological stress, then the way in which an event is appraised and how the individual copes with it must be considered in any serious attempt to understand psychophysiological (specifically cardiovascular) effects of acute life stressors.

Certain investigations suggest some of the physiological mechanisms by which stress may enhance the production of CHD (see Friedman, 1977; Rosenman & Friedman, 1977). They include increases in such traditional risk factors as serum Ch and blood pressure (BP); acceleration of the rate of development of damage to the intima (inner layer) of the coronary arteries over time; and facilitation of the aggregation of blood platelets (i.e., cells found in blood that are important in coagulation), which are then incorporated into arterial plaques and contribute to narrowing of the coronary vessels and atherosclerosis.

Stress can also contribute to CHD through the body's general reactions to aversive stimulation. It is widely agreed that such stimulation leads to the discharge of the sympathetic nervous system and related hormones such as adrenalin (epinephrine- EP) and noradrenalin

(norepinephrine-NE) (see Mason, 1972). These hormonal substances, called catecholamines, are released from the adrenal medulla and, in the case of NE, from sympathetic nerve endings as well. EP and NE can accelerate the rate of arterial damage and, indeed, induce myocardial lesions. These hormones also potentiate the aggregation of blood platelets, and the release of platelet contents is considered to be an important factor in atherogenesis as well as genesis of thrombosis (Theorell & Rahe, 1971).

In addition to the adrenal medulla, the adrenal cortex is also involved. The adrenal cortex is known to be involved in the regulation of Ch metabolism. An extensive body of research documents a positive association between psychological stress and certain adrenal hormones such as cortisol (see Mason, 1972). Cortisol secretion is of great importance for a stress-CHD relationship since it increases free fatty acid (FFA) release and leads to a rise in serum lipids and Ch.

It appears then that adrenal secretions (catecholamines and cortisol) may have special significance in the development of CHD. It follows that any psychological agent that increases these substances in the blood may be a potential pathogen for cardiovascular function. The relationship between stress and the TABP will be made after a description of the TABP itself.

1.C HISTORICAL OVERVIEW

The TABP is an epidemiological construct that arose from Friedman and Rosenman's (1974) observations of the behavior of cardiac patients in their practice during the 1950's. When compared to non-cardiac patients, the cardiac patients were middle-aged and younger patients suffering from cardiac disorders who seemed to have a certain constellation of behavioral characteristics. Because of the failure of traditional risk factors for heart disease (e.g., hypertension, Ch levels, smoking) to predict even half of their new cases of clinical CHD, they began observing the collection of behaviors that subsequently was called the TABP. Prior to the work of Friedman and Rosenman, the theme of the early work (and some of the current work as well) was on identifying the coronary personality qua personality. Friedman and Rosenman were credited with pioneering and developing an approach that focused on behavioral responses to environmental stimuli. They began the search for behavioral characteristics or responses to the environment that might be related to coronary artery and heart disease. Rather than a personality type as such, they proposed that it is a behavior pattern which bears an etiological relationship to CHD.

1.D DESCRIPTION AND ASSESSMENT OF THE CPBP

The development of the CPBP which grew from the work of Friedman and Rosenman began in the early 1950's and made its first appearance in the literature at the close of that decade (Friedman & Rosenman, 1959). Since then these researchers have further refined their model of the CPBP. Refinement has led Friedman and Rosenman (1974) to formulate the following definition of Type A (TA): it is "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 efforts of other things or other persons" (p.67). The overt manifestations of this pattern include explosive, accelerated speech; a heightened pace of living; impatience with slowness; concentrating on more than one activity at a time; self-preoccupation; dissatisfaction with life; evaluation of the worthiness of one's activities in terms of numbers; a tendency to challenge and compete with others even in noncompetitive situations; and a free-floating hostility (Matthews, 1982). The major facets of the CPBP include a chronic sense of time urgency, a striving to accomplish more and more in less and less time, a hard driving and competitive orientation which may include barely concealed hostility, and chronic impatience with people and situations that are perceived as obstacles to

their attempts to maintain high levels of goal achievement (Rosenman, 1977).

In addition, the TABP is not simply an individual personality facet. Instead, the behaviors emerge when certain conditions exist in the environment of TA susceptible people (Matthews, 1982). Furthermore, the TABP is not considered to be a discrete typology. Matthews (1982) explains that the TABP is thought to be a continuum of behaviors ranging from extreme TA to Type B (TB).

The 20th century environment that is associated with the CHD incidence encourages TA behavior because it appears to offer special rewards to those who can perform rapidly and aggressively. Furthermore, with increasing urbanization and technological advances along with increasing population density, we are presented with unique new challenges never experienced by earlier, less time-conscious generations. The TABP does not solely stem from an individual personality but emerges when certain challenges or conditions of the milieu arise to elicit this complex of responses in susceptible individuals (Rosenman, 1977).

Thus, the CPBP is an action-emotion construct. More importantly, it is a complex construct which is in need of more extensive theoretical development and research. Despite over 20 years of work with the meaning, validity, and predictive power of the construct, the CPBP is at a

relatively early state of refinement. The significance of its current state of evaluation is that whatever description and/or definition is currently designated for the CPBP, there is a high degree of probability that as additional information is gathered the meaning of the construct will change.

So, the problems involved in assessing the CPBP are significant. The most prominent and published assessment techniques are the Structured Interview (SI), developed by Rosenman and Friedman (1964), and the Jenkins Activity Survey (JAS), a self-administered computer scored questionnaire (Jenkins, Rosenman, & Friedman, 1967). Several other approaches to assessment have been attempted such as the Framingham Type A Scale (Haynes, Levine, Scotch Feinleib, & Kannel, 1978), the Performance Battery and Short Rating Scale developed by Bortner (Bortner, 1969; Bortner & Rosenman, 1967), and various assessments of speech stylistics (Friedman, Brown, & Rosenman, 1969; Schucker & Jacobs, 1977). However, since the SI and JAS have been most utilized for research in this field, the comments that follow focus primarily on these two assessment techniques.

1.D.1 Structured Interview

The classification of individuals as TA or TB is often based on a standardized stress interview developed by Rosenman and Friedman (1964). This interview relies on both the content and overt behavioral style of the subject's responses to rate his behavior pattern on a four-point scale: fully developed pattern (A1); incompletely developed pattern (A2); the absence of A characteristics (B); and an intermediate pattern (X). Type X is evidenced in persons who exhibit an equal amount of both the TA and TB patterns. According to Friedman and Rosenman (1974), approximately 10% of the population fall into the X category.

The SI is a standardized clinical technique. The subject is asked about 25 questions dealing with the intensity of his ambitions, competitiveness, sense of time urgency, and the nature and magnitude of hostility (Rosenman, 1977). For example, individuals are asked about their reactions to working with slow people and to waiting in lines. Another question asks whether a spouse or close friend would describe them as hard-driving and competitive. More important, the interviewer deliberately phrases his questions so as to create a stressful atmosphere for the subject. The assumption is that these conditions are optimal for eliciting signs of impatience, aggressiveness,

competitiveness, etc. For example, a question with an obvious answer may be asked in a hesitant and slow manner. The TA individual usually interrupts and answers prior to the completion of the question. Or the interviewer may express doubts as to the accuracy of an answer, in an attempt to arouse annoyance in the susceptible individual. The manner and tone in which the subjects respond (for example, his general appearance, body movements, explosive speech) are somewhat more important than the content of his answers, though the latter is considered to be important in reaching a final judgment. The interviews are taped for later assessment.

In addition to the interview yielding an overall TA judgment, it can be scored reliably for individual questions and for the TA speech behavior that is displayed during the interview (Dembroski, 1977; Matthews, Glass, Rosenman, & Bortner, 1977). Factor analysis of these ratings in samples of male undergraduates and in working men have displayed four independent factors: clinical ratings of speech behavior, self-reports of pressured drive, anger, and competitiveness (Matthews et al., 1982).

Discussion of the reliability and validity of these assessment methods will follow in a later section.

1.D.2 Jenkins Activity Survey

Another commonly used technique for assessing TABP is an objective self-administered questionnaire developed by Jenkins (see Jenkins et al., 1967; Jenkins, Zyzanski, & Rosenman, 1971). The JAS provides continuous scores on the A-B dimension. It represents an effort to duplicate with a pencil and paper device, the assessment of the TABP which was achieved with the SI. It is a 54-item instrument with questions similiar to those of the SI. Scoring of the items is based on optimal weights generated by a series of discriminant function analyses predicting the SI classification of large groups of men enrolled in the Western Collaborative Group Study (WCGS) (Jenkins et al., 1971). The JAS scores of this sample were normally distributed. Therefore, a linear transformation was applied to all programs that score the test so that the mean of the A-B scores is 0.0 with a standard deviation of 10.0. Positive scores denote the TA direction, and negative scores denote the TB direction (Glass, 1977c). Factor analysis of the JAS shows the following breakdown: Speed and Impatience, Hard Driving, Job Involvement, and Anger-Hostility (Zyzanski & Jenkins, 1970).

1.D.3 Framingham Type A Scale

The third measure of TA, the Framingham TA scale, is a self-report measure that contains 10 items. These items assess the individual's competitive drive, sense of time urgency, and perception of job pressures (Haynes et al., 1978). These items were chosen from a 300-item inventory to represent the basic aspects of TA. Each item is unit weighted, and then all items are summed to yield a total TA score. Those who score above the sample median are considered TA, whereas those who score below are considered TB (Chesney, Eagleston, & Rosenman, 1981).

1.D.4 Comparisons Of The JAS, SI, And Framingham TA Scale

All three TA measures appear to be reliable. For example, 80% of the men in the WCGS show similar interview-based classifications over periods ranging from 12-20 months. Assessments of recorded interviews of men by two independent raters reveal agreement rates on the order of 75% - 90% (Chesney et al., 1981), although the rate may be considerably lower for interviews of middle-aged women (Haynes et al., 1980). Test-retest correlations of the various forms of the JAS have ranged between 0.60 and 0.70 across a 1-4 year time interval (Jenkins, 1977). The Framingham TA Scale has an internal reliability of 0.70 (Haynes et al., 1980).

By using the SI behavior assessment as a criterion in its development, the JAS was designed to provide a measurement for the same behaviors as are assessed in the SI. Therefore, a high degree of comparability would be expected between the two instruments. Unfortunately, the empirical evidence which addresses this issue is somewhat disappointing. Jenkins et al., (1971) report agreement between JAS and SI classifications in about 73% of the cases. By using only the extreme JAS scores, the same study indicates an increase in agreement to 88-91%.

Part of the problem lies in the fact that these two procedures are not really measuring exactly the same behavior. According to Chesney et. al., (1981), the classification which comes from the SI is very much dependent on interviewer observations of overt behavior, while the JAS depends on self-report content alone. Even though the agreement is less than desirable between two standardized instruments it is probably unreasonable to expect a subjective self-report measure to provide the same information as a direct "objective" observation. Even Jenkins (1976) has admitted that the JAS misclassifies too many subjects.

1.D.5 Other Assessment Devices

The SI and JAS are clearly the two most widely used measures of the CPBP. Almost all of the literature references to CPBP measurement cite either the SI or the JAS. Nonetheless, there have been a few attempts to assess the TABP in other ways.

Another of these techniques is the Bortner Performance Battery which consists of a series of 11 cognitive and psychomotor tests (Bortner and Rosenman, 1967). Only nine scores made significant contributions to the prediction of TA behaviors and the performance scores agreed with the interview classifications only 66% of the time (Chesney et. al., 1981).

The Bortner Short Rating Scale (Bortner, 1969) represents another attempt to assess the CPBP via a self-report test. The scale is a 14-item self-administered, semantic differential type. Bortner reports 64- 75% agreement in classification using the SI as the criterion. Virtually no other research has been reported using this instrument. While the Bortner Scale may have significant potential, too little is known about it at this time to consider it a major assessment device.

Lastly, some work has been reported using voice analysis as a predictor of CPBP. The method reported by Friedman et al., (1969) has demonstrated high agreement (84%) between voice determined classifications and the SI. More recently, encouraging results have been reported involving voice analysis through the use of objective rating scales (see Scherwitz, Berton, & Leventhal, 1977; Schucker & Jacobs, 1977). Once again, far too little has been done to draw any meaningful conclusions as to the potential contribution this line of assessment may make.

To date, the SI has been most often used in population groups made of middle-aged, middle to upper socioeconomic class, employed, white males. Therefore, modifications have been necessary for research of TA behavior in other populations including women (Waldron, 1978) and undergraduate college students (Dembroski, MacDougall, Shields, Petitto, & Lushene, 1978; Scherwitz, 1977).

Finally, it should be noted that a few investigators have developed protocols that include the standard SI and use additional questions at the end of the interview. Dembroski, MacDougall, & Lushene (1979) report using a seven question American history quiz of "allegedly well-known events" which was delivered in a very challenging manner that emphasized performance. In Dembroski et al's., (1979) study, electrocardiogram and BP monitoring was done during

both the SI and the quiz. Among other findings, they note that TA subjects showed significantly greater BP elevations than TB subjects during the quiz (Dembroski et al., 1979).

Another protocol that consists of an elaboration on the original SI is that used by Chesney et al., (1981). These researchers, after conducting the SI in the standard manner and stating that the interview is over, ask subjects to provide feedback on the interview experience. During what they call the "debriefing" session, the interviewer asks very general questions (e.g., "What was the interview like for you?" "Were there any parts of the interview that were annoying?") and changes the interviewing style (i.e., no longer confrontive and challenging but rather supportive and encouraging). These authors are currently conducting research regarding possible differences in subject behavior during the SI and the debriefing. Research of this type will assist in estimating the generalizability of behavior seen during the SI to that shown under more naturalistic conditions.

Due to the complexity and multidimensionality of the CPBP other objective procedures have been incorporated in the assessment process. These include physiological measures, endocrine measures, motor behavior characteristics, and psychological response characteristics. These will be discussed in detail in later sections.

1.D.6 Summary

In summary, the major facets of the TABP are a chronic sense of time urgency and a striving, by preference or necessity, to accomplish more and more and to be ever more involved, despite an increasing lack of time. TAs have enhanced aggressiveness and drive that are usually associated with or evolve into competitive hostility. TA behaviors occur when these traits are stimulated. Therefore, it depends on the nature of environmental stimuli, challenges, and demands that confront individuals, as well as their interpretation of these phenomena. When an individual interprets and responds to environmental challenges without feeling compelled to strive against either time or other persons, then the TABP will not emerge. In contrast, TA behavior will usually surface when a person who initially has only a moderate sense of time urgency and aggressive drive is repeatedly confronted with intense environmental demands that he interprets as necessary to be complied with in a minimum of time and with a maximum of aggressive drive.

Finally, a number of self-report written questionnaires, along with voice analysis, significantly correlate with the SI and show promise as TA assessment devices. However, none of these methods has been found to have the predictive validity of the global assessment of the

TABP that is based on the SI.

1.E CPBP AND PERSONALITY VARIABLES

The progression of work on improving the conceptualization of the CPBP has led to an interesting question: "To which, if any, personality dimensions is this behavior pattern related?" The answer to this question might not only help to further define the CPBP, but it might also provide inferences which could be made about the association between CVD and the CPBP: that is, if the behavior pattern is simply an extension of a personality type or of a constellation for different intervention strategies.

Since it is possible that the CPBP is a sequela of underlying personality dimensions, it is somewhat surprising that relatively few studies have examined this issue. One of the first studies to address this issue does so only tangentially. Bahnson and Wardwell (1966) reported on data from the Middlesex County Heart Study and the Southeastern Connecticut Heart Study, both of which were designed to evaluate personality traits and sociological conditions predisposing to CHD. Even though the CPBP was not a variable per se, these authors concluded that the behavior pattern explained some of the personality manifestations of the older age coronary groups such as compulsivity, excessive conformity, and reaction formation.

In related studies Blumenthal, Thompson, Williams, and Kong (1978) along with Nowack and Sassenrath (1980) posit a possible link between anxiety and insecurity and the CPBP. Blumenthal et al., (1978) attempted to determine whether anatomic coronary involvement was related to a number of psychological variables including a measure of anxiety-proneness. Their results showed that patients with MI had significantly less anxiety than patients without such a history. Nowack and Sassenrath (1980) took this a step farther. These researchers added a measure of locus of control to their measure of anxiety. They discovered that TAs with an internal locus of control exhibited a low anxiety score.

Perhaps the most extensive work on CPBP and personality was reported by Rosenman, Rahe, Borhani, and Feinleib (1974). These researchers assessed 190 sets of twins on the CPBP (via the SI) along with a battery of personality instruments including the Thurstone Temperament Schedule, the Gough Adjective Check List, the California Personality Inventory, and the Minnesota Multiphasic Personality Inventory. The behavior pattern correlated significantly with the following scales: active, impulsive, dominant, sociable, aggression, and exhibition.

Recently Irvine, Lyle, and Allon (1982) conceptualized the TA personality as a form of psychopathology. They investigated the relationship between the JAS and other personality measures including the Eysenck Personality Inventory, the Personal Deviance Scale, and a measure of Achievement Need. They found significant correlations between Neuroticism and both the TA and the Speed and Impatience subscale of the JAS. Furthermore, the TA scale was also found to correlate with Dominance and Extrapunitiveness, and the Speed and Impatience subscale correlated with Extrapunitiveness. No correlation was found between any JAS scale and the measure of Achievement Need. Lastly, they showed that the TA group was significantly more neurotic. In conclusion, it seems relatively clear on the basis of the available research results that the CPBP is not independent of personality dimensions. It seems almost as evident, however, that no one, or combination, of a few traits could explain or predict aggression and impulsivity which have been used to describe both the behavior pattern itself and characteristics of individuals who have experienced a variety of CHD symptoms. However, the CPBP as a construct appears to represent a relatively "independent" cluster of behaviors. Glass (1977c) points out that the modest associations between the behavior pattern and the particular personality traits linked to it "attest to the psychological meaningfulness of the pattern and thus provide

additional evidence for the validity of the notion of a CPBP" (p.188).

1.F ASSOCIATION OF THE CPBP AND CHD

In many ways the true importance of the CPBP is bound with its association with CHD. Even though the behavior pattern itself is worthy of investigation apart from any hypothesized relationship with CHD, it seems true that the core of its significance may be found in its potential for relating these two areas.

The relationship between CPBP and CHD may be studied in at least two ways. The first consists of determining the extent to which there is evidence of a statistical association between the two. The second, and far more difficult to deal with, concerns the mechanisms involved in any statistical associations which exist and is essentially a search for an elusive cause-and-effect relationship. In this section, the first method, statistical association will be examined with a consideration of mechanisms to follow.

Clearly the bulk of the research involving the CPBP has centered around "predicting" retrospectively or prospectively either CHD or its traditional risk factors such as hypertension, hypercholesterolemia, elevated catecholamine levels, and cigarette smoking.

Before examining selected literature showing the association of the CPBP to CHD, let us focus on two questions: What is the relationship between A-B behavior and the traditional risk factors in predicting CHD?; and Is the behavior pattern an independent risk factor for CHD? To answer these questions, data from the WCGS will be used since this is the major large-scale prospective incidence study. The following results are based on analysis of 3,154 subjects in the WCGS who were free of CHD at intake (see Table 1.1). The relationship between the behavior pattern and CHD incidence with no adjustment for other factors shows that TA subjects have an estimated 2.37 times the risk of the TB subjects. The major traditional risk factors--age, SBP, cigarette smoking, and serum Ch-- are all correlated about .06-.09 with the behavior pattern. Adjustment for any of these factors, one at a time, reduces the relative risk to about 2.25. Adjustment for all of these factors simultaneously reduces the estimated relative risk to 1.97. It is apparant that a relative risk of about 2 persists after adjustment that does not seem to operate through those traditional risk factors. To this extent, it can be said that the behavior pattern is an independent factor.

One of the earliest studies investigated the behaviors and environments of over 1400 Benedictine and Trappist monks (see Caffrey, 1977). The behavior pattern was classified using the SI. Caffery was able to demonstrate that monks

Table 1.1 Relationship between coronary heart disease incidence and behavior pattern assessed by the Structured Interview, with various adjustments for other major risk factors measured at intake exam.

Adjustment Factors							
Age (yrs.)	Systolic Blood Pressure (mm Hg)	Cigarette Smoking (4 level)*	Cholesterol (mg/100 ml)	Logistic Coefficient	Significance Probability (P)	Correlation of Factor with Beh. Patt.	Approximate Relative Risk (odds ratio)
				.863	<.0001		2.37
yes	yes			.797	<.0001	.089	2.21
		yes		.805	<.0001	.078	2.23
			yes	.814	<.0001	.078	2.25
				.819	<.0001	.057	2.26
yes	yes			.755	<.0001		2.12
yes		yes		.747	<.0001		2.11
yes			yes	.766	<.0001		2.15
	yes	yes		.749	<.0001		2.11
	yes		yes	.769	<.0001		2.16
		yes	yes	.783	<.0001		2.19
yes	yes	yes		.698	<.0001		2.01
yes	yes		yes	.728	<.0001		2.07
yes		yes	yes	.727	<.0001		2.07
	yes	yes	yes	.727	<.0001		2.07
yes	yes	yes	yes	.682	<.0001		1.97

*Smoking status coded: 0 = nonsmoker, 1 = less than a pack per day, 2 = one pack per day, 3 = more than a pack per day.
From Brand, (1977).

who experienced a MI scored higher on a measure of the CPBP than monks who had not had a MI.

Since 1970, several studies have found evidence supporting the association of TABP with prevalence of CHD. In a retrospective study in the WCGS, 83 men under the age of 60 who sustained a first attack before taking the test were compared with 468 random controls (Jenkins et al., 1971). The mean TA score was significantly higher for the cases than for the controls. In a study at Bridgeport Community Hospital, 48 patients with CHD (both men and women) scored significantly higher on the TA scale than 42 patients hospitalized with other diseases (Kenigsberg, Zyzanski, Jenkins, Wardwell, & Licciardello, 1974).

In a related study, Shekelle, Schoenberger, and Stamler (1976) examined the prevalence of MI in 1,209 middle-aged white males entering a screening program of the Chicago Heart Study. These investigators found the TA score significantly related to prevalence of CHD after age, Ch, BP, and cigarette smoking were controlled statistically.

The consistent cross-validation supplied by these and other studies lends strong support to the theory underlying the relation of the TABP to CHD. In addition, Friedman, Rosenman, Strauss, Wurn, and Kositchek (1968) used a somewhat different approach to demonstrate association. These investigators conducted a post mortem study of 80

deaths associated with cardiovascular and non-cardiovascular causes. Interviewing relatives of the deceased subjects to determine behavior patterns, they found a significantly greater percentage of CPBPs among those dying from CHD than among those dying from non-coronary causes. In fact, persons classified as TA succumbed to coronary artery disease (CAD) six times more frequently than those who were classified as TB. The former persons also exhibited severe basic coronary atherosclerosis six times more frequently than the latter subjects.

This relationship of CPBP and atherosclerosis is supported by a number of studies. Zyzanski, Jenkins, Ryan, and Flessas (1976) studied males with a variety of cardiologic diagnoses who underwent coronary angiography at Boston University and who also completed a JAS at admission. Those with two or more coronary vessels obstructed 50% or more were found to score higher on all four JAS scales than those with lesser atherosclerosis.

In a second study, Blumenthal, Kong, and Rosenman (1975) studied 142 men and women who had undergone coronary angiography at Duke University Medical Center. These patients were classified as TA or TB by the SI and JAS. 82% of the patients with at least 75% narrowing of one or more coronary arteries were classified as TA, whereas only 37% of patients with lesser arterial disease had been judged TA.

These studies along with others found a strong relation between the TABP and severity of atherosclerosis. This association suggests that one way the TABP raises the risk of CHD may be through its association with increased development of atherosclerotic plaques.

Research focusing on the possible association between the CPBP and CHD has also included non-American samples. For example, Theorell and Rahe (1972) reported that coronary victims in Sweden showed more hostility when slowed by others than did non-coronary controls. In addition, in a Scandinavian study focusing on women, Bengtsson, Hallstrom, and Tibblin (1973) observed both coronary patients and healthy controls. The women who had experienced MI displayed significantly higher levels of aggression and self-assertiveness (CPBP traits), and were somewhat higher on achievement.

There is also some evidence that in addition to its predictive potential with regard to CHD, the CPBP can be associated with specific types of CHD. The CPBP has been found, for example, to be associated with both higher rates of MI and with angina pectoris (Rosenman, Friedman, Strauss, Jenkins, Zyzanski, & Wurn, 1970).

1.F.1 Summary

A number of studies have been undertaken to determine the degree of association between the CPBP and traditional risk factors. With very few exceptions, significant associations have been found. Associations have been reported between the CPBP and elevated Ch, triglycerides (TG), and lipoproteins (Blumenthal et al., 1975; Friedman, Byers, Diamant, & Rosenman, 1975; Friedman, Byers, & Rosenman, 1964; Friedman & Rosenman, 1974), between the CPBP and elevated excretion of NE (Friedman et. al., 1975), and decreased blood clotting time (Rosenman & Friedman, 1961; Friedman & Rosenman, 1959).

In fact, the majority of published research provides support for the conclusion that a relationship exists between the CPBP and CHD and its traditional risk factors. Indeed a thorough review (see Jenkins, 1976) lists 24 studies that addressed the question of a relationship between the CPBP and CHD.

1.G MECHANISMS LINKING BEHAVIORAL AND PATHOPHYSIOLOGICAL PROCESSES

The issue of mechanisms is very fundamentally a question of cause-and-effect. It is an issue dealing with the question of what are the psychophysilogic properties of

a CPBP person which are not present in the non-CPBP person which lead to CHD? More determination of the biochemical and neuroendocrine mechanisms that are involved in the possible linkage of the CPBP with CHD.

The association between specific patterns of behavior and various manifestations of CHD suggest the existence of mechanisms whereby behavioral phenomena are linked, presumably, via central nervous system effects, with those processes involved in atherogenesis and the precipitation of acute clinical events. Results of clinical, epidemiological, and laboratory studies indicate that behavior patterns seen in certain individuals under natural circumstances can be elicited in laboratory situations and can be elicited in experimental animals. On the basis of these studies, a hypothesis concerning these mechanisms has been formulated. The approach to this hypothesis necessitates consideration of (1) neuroendocrine and metabolic responses associated with such observable behavioral phenomena, (2) qualitatively distinct patterns of cardiovascular responses observed in association with varying organism-environmental interactions, (3) laboratory studies of individual differences observed in psychomotor responses to situational variables, and (4) behavioral-physiological studies in experimental animals that suggest these interactions have pathophysiological consequences.

1.G.1 (1) Biochemical And Neuroendocrine Mechanisms

There are several pathophysiological processes that may accelerate the onset of CHD in TA subjects. The most extreme evidence concerning such processes is related to certain biochemical and neuroendocrine responses to physiologic and behavioral challenges which have been identified in middle-aged male subjects. The data presented below were derived primarily from comparisons of TA subjects with TB subjects.

First, most TA subjects exhibit an increased serum level of corticotropin (ACTH) (Friedman, Byers, & Rosenman, 1972). This presupposes both an increased secretion of hypothalamic corticotropin releasing factor and of pituitary melanocyte stimulating hormone. The latter's presumed excess secretion probably is the reason for the increased occurrence of periorbital pigmentation in many TA subjects (Friedman et al., 1972).

Second, despite this increased serum level of ACTH, most TA subjects respond subnormally (in respect to cortical secretion) following the injection of exogenous ACTH (Friedman, 1969).

Third, most TA subjects, when studied in their usual working milieu or when engaged in a competitive contest that challenges them, both excrete increased NE (Friedman,

St. George, & Byers, 1960) and exhibit a higher serum level of this same hormone when compared to TB subjects (Friedman et al., 1975). In addition to NE, Glass and his co-workers (1980) have demonstrated changes in EP during both aversive stimulation and competition. These investigators examined the relationship between TA behavior and cardiovascular and plasma catecholamine responses to competition and harassment. Their results showed that the presence of a hostile opponent caused no significant differences in the responses of TBs, but TAs showed increases in SBP, HR, and plasma EP during competition. In addition, TAs showed greater BP and plasma EP elevations when both types were confronted by the challenge of competition. These conclusions led Glass and his co-workers to hypothesize the role of sympathetic activation in mediating the tendency of TA individuals to develop CHD. Sympathetic activation and TA behavior was also demonstrated in a study by Contradada, Glass, Krakoff, Krantz, Isecke, Collins, and Elting (1982). These researchers showed that when TAs performed a reaction time task where they could avoid aversive stimulation (loud noise or shock) by attaining a predetermined criterion of speed, TAs displayed greater increases in response time speed, SBP, and DBP, and plasma EP.

In a recent study Williams, Lane, Kuhn, Melosh, White, and Schanberg (1982) discussed the qualitatively distinct patterns of cardiovascular and neuroendocrine responses that occur during mental work and during sensory intake task performance. During mental work, TA subjects showed greater muscle vasodilation and increased secretion of NE, EP, and cortisol than did TBs. During sensory intake (reaction time), TA hyperresponsivity was found for cortisol.

Fourth, compared to TB subjects, TA subjects exhibit an increased serum TG prior to and for many hours following the ingestion of a fat meal (Friedman et al., 1964). According to Friedman et al., (1964), such persons typically show increased sludging of erythrocytes during their postprandial hypertriglyceridemic cycle.

Lastly, most TA subjects exhibit hypercholesterolemia (Friedman, Byers, Rosenman, & Elevitch, 1970). Their hyperlipoproteinemia is usually of the Type III or IV variety (Levy-Frederickson classification).

1.G.2 (2) Specific Patterns Of Behavioral-Cardiovascular Response

It must be noted at the outset that there are very few published studies documenting a difference between TA and TB subjects in psychophysiological response to environmental stimulation. This state of affairs is in contrast to the

area of neuroendocrine response, where the work of Friedman, Rosenman, and colleagues, as noted above, has shown clear differences between the types, particularly with regard to responses of biochemical indices of sympathetic nervous system function. Preliminary investigations by Dembroski et al., (1978) suggest that HR and BP responses are more marked in young TA males during challenging perceptual- motor and cognitive tasks. Dembroski et al., (1979) also tested the hypothesis that TA subjects respond with greater cardiovascular response than TBs during the SI. As they predicted, TAs showed greater increases in both SBP and DBP, which were sustained over the course of the entire 12-15 minute interview (interpersonal exchanges).

After Dembroski's earlier work, a number of studies have furthered the research on TA's psychophysiological responses. VanEgeren (1979a) had male and female subjects play a mixed-motive game against a male confederate under either a 20% cooperative or an 80% cooperative strategy while cardiovascular responses were monitored. He found that subjects who were more competitive during the game or who scored higher on a TA behavior scale or who reported having an action orientation toward life stress tended to have larger HR responses during the game than those classified as TB.

Another study investigated the relationship between the TABP and the sympathetic nervous system arousal elicited during challenge (Gastorf, 1981). TA and TB subjects were assigned to a task whose instructions indicated that the task was either easy or hard (subjective) and which was in fact either easy or hard (objective). TBs became physiologically aroused only when they encountered a hard task that they were expecting to be hard. TAs on the other hand, became physiologically aroused both when the task was hard and also when they expected it to be hard. This latter effect was present even when the task was in fact easy. These results shed some light on the role that situational factors play in the behavioral and physiological differences between TA and TB individuals. TAs appear to be able to handle an easy task with the same minimal arousal as their TB counterparts. When the task is difficult they become appropriately aroused which would account for their reputation as achievers and hard-driving. However, the fact that they become inappropriately aroused during an easy task which they are told is a hard task might be a key to their pathological behavior pattern. The fact that they did not perceive that they were engaged in an easy task would indicate that TAs are more sensitive to external cues than to internal cues of the level of task difficulty. The stressful response of a TA individual to a nonstressful environment might lead to an increased disease risk for that

individual (Gastorf, 1981).

Gastorf's (1981) study also demonstrated that TAs reported arousal only with the objectively hard task and failed to report arousal when they were physiologically aroused during the subjectively hard but objectively easy task might also have pathogenic implications. TAs would appear to be unable to discriminate accurately between various states of arousal. This takes on a clinical relevance when compared with the findings that TAs tend to delay reporting heart attack symptoms and fail to label physical symptoms as illness behavior.

Even though little is known regarding how TA and TB subjects might differ in terms of psychophysiologic responses, there is a great deal of evidence suggesting that behavioral stimulation can exert a potent influence upon various aspects of cardiovascular function. Recent advances in knowledge of the central nervous control of circulation have led to the proposition that the brain is organized not to produce isolated behavioral or physiological responses, but rather to integrate patterned responses of both behavioral and physiologic functions.

An example of one such centrally mediated response system is seen when "fight/flight" behavior is engendered by a variety of experimental situations. In such situations, there are observed concomitant increases in motor activity,

cardiac output, and muscle blood flow, while there is an active vasoconstriction in the skin and visceral circulations (Brođ, Fencł, Hejl, & Jirka, 1959).

Both the cardiac output/muscle vasodilation response pattern observed during emergency situations and in association with "mental work" and the total peripheral resistance/muscle vasoconstriction pattern observed during attentive observation of the environment could prove to be important contributors to the endothelial "injury" that has been proposed as the initiating event in atherogenesis (Dimsdall, Hackett, Hutter, Block, Catanzans, & White, 1982). Furthermore, activation of such sympathetically mediated physiologic response patterns could also be playing a role in the precipitation of acute clinical CHD events, via effects to increase myocardial oxygen consumption beyond the capacity of an atherosclerotic coronary system or via precipitation of potentially fatal arrhythmia. The association of TA behavior with both increased levels of arteriographically- documented coronary atherosclerosis and increased incidence of acute CHD clinical events suggests that both the above "pathopsychophysiological" mechanisms could be operative in the TA individuals.

1.G.3 (3) Behavioral Responses To Situational Variables

The concept of perceived control is helpful in understanding the circumstances under which TA subjects are more likely than TB subjects to demonstrate potentially damaging physiologic reactions. If the TA individual is, indeed, more concerned than his TB counterpart with controlling the physical and social environment, then he should show greater increments in sympathetic cardiovascular activity in response to threats to that control, and should increase his efforts at mastery. However, he should become even more distressed and give up efforts at control when the threat is, in fact, beyond his control, so try as he may, there is nothing he can do to master the situation.

Preliminary support for these notions comes from a retrospective study in which Glass (1977c) compared coronary patients, non-coronary patients, and healthy, non-hospitalized controls. The scores on a so-called Loss Index, a 10-item scale from the Holmes-Rahe Schedule of Recent Experiences (Holmes & Rahe, 1967) that asked a person to describe the incidences during the last year of stressful life events over which he had minimal control (e.g., death of a loved one or being fired). Both patient groups experienced such losses to a greater extent than the non-hospitalized controls.

In addition, research by Glass (1977a) on reaction to controllable versus uncontrollable stress seems to indicate that the TA individual at first tries harder than the TB individual to control highly stressful situations. Extended stress exposure, however, may lead to greater certainty of lack of control, hence to feelings of helplessness and a decline in efforts at mastery. Glass (1977b) refers to this reaction pattern to uncontrollable stress by TAs as initial hyper-responsiveness (such as psychomotor activity) followed by subsequent hypo-responsiveness.

1.G.4 (4) Pathophysiological Processes In Animal Models

A variety of experimental paradigms have linked prolonged, severe behavioral stress with the development of cardiovascular pathology. The literature also suggests that at least two diverse sets of experimental contingencies may lead to separate modes of biochemical and physiological response, which may in turn lead to different pathological consequences. In terms of experimental contingencies, a tentative distinction can be made between predictability, control, and dominance, on the one hand, and unpredictability, helplessness, and a submissive posture on the other.

In the face of severe or prolonged aversive stimulation, dominant animals, who possess an appropriate coping response and a predictable schedule, will ordinarily exhibit a broad range of neuroendocrine, metabolic, and cardiovascular phenomena, including an increased Ch level (Friedman & Rosenman, 1959), elevated arterial pressure (Forsyth, 1971; Herd, Morse, Kellcher, & Jones, 1969), decreased clotting times (Friedman & Rosenman, 1959), and myofibrillar degeneration (Corley, Mauck, & Sheel, 1975).

In contrast to the pattern of cardiovascular responses that occur when an animal is able to exert control over its environment, a different pattern of cardiovascular changes seems to occur when an animal lacks control. Thus, during a procedure in which irregularly scheduled electric shocks are presented (Corley et al., 1975), after inescapable water stress (Richter, 1957), or when a submissive animal has no escape from a victor (VonHolst, 1972), a pattern is seen in which bradycardia may be followed by death, but evidence of structural pathology is not apparent.

The physiological mechanisms leading to pathological states remain speculative. However, active coping during predictable aversive situations is usually associated with increases in HR, cardiac output, BP, and blood flow to muscle. Activation of the sympathetic nervous system leads to the release of catecholamines, which directly affect the

heart and vasculature, and also lead to increased Ch levels and platelet aggregation as well as to decreased clotting time. Effects of diet, including fats and salt, interact with the neurogenic factors in mediating long-term effects (Djojosingito, Folkow, Kylstra, Lisander, & Tuttle, 1970).

The physiological mechanisms that occur in animals revealing bradycardia in the face of an unavoidable stressor are even more speculative than those associated with coping. If the aversive situation occurs suddenly and unpredictably, the animal may show a pronounced increase in plasma EP as well as NE (Mason, Mangan, Brady, Conrad, & Rioch, 1961). In the absence of movement, animals reflexively respond to a pronounced increase in BP with a profound bradycardia. Such a situation leads to a relatively large secretion of NE and acetylcholine at the heart, a condition promoting arrhythmias (Manning & Cotten, 1962). In the presence of marked adrenergic activity, decreased cardiac output associated with bradycardia and increased afterload could lead to a decrease in myocardial oxygenation, another condition facilitating arrhythmias, as well as MI.

The link between behavioral phenomena and CHD must include many physiological processes. Distinctive behavior patterns occur repeatedly in certain individuals over a long period of time and lead eventually to clinical manifestations of CHD. Many physiological systems

participate in behavioral phenomena and many pathophysiological processes contribute to atherogenesis. Ultimately, the clinical complications of CHD occur when other pathophysiological processes operate in the presence of CAD. The challenge for behavioral physiologists is to utilize the theories and facts from modern physiology in determining the link between behavior, atherogenesis, and CHD.

At one level of analysis, there are two avenues whereby behavior pattern might be playing a role in the etiology and course of CHD. First of all, the TABP might be instrumental in precipitating acute clinical events in patients with pre-existing advanced coronary atherosclerosis. In addition, and perhaps in combination with this mechanism, behavior pattern might be playing a contributory role in the atherosclerotic process itself. The strongest available evidence, from the WCGS (Rosenman et al., 1975) indicates that TA men experience about twice the incidence of clinical CHD events over an eight and one-half year follow up compared to TB men.

With respect to the second mechanism, contribution to the atherosclerotic process itself has been reported, on the basis of findings at coronary arteriography, greater levels of coronary atherosclerosis among TA patients compared to TB patients (Blumenthal, 1975, 1983; Zyzanski, Jenkins, Ryan, &

Flessas, 1976).

If it can be assumed that the available evidence (see Association section of this review) indicates: (1) that the case for a role of behavior pattern in predicting subsequent clinical CHD events is nearly as strong as that for the traditional risk factors, and (2) that given the unavoidable limitations on the types of studies that can be mounted, there is some evidence supportive of a role for behavior pattern in the atherosclerotic process, the question that may now be posed is, "By what physiological mechanisms is the (putative) association between behavior pattern and clinical events and coronary atherosclerosis mediated?"

In much of his work, Friedman (eg. 1977) has described in detail characteristics of neuroendocrine response that differentiate TA from TB subjects. The increased urinary NE excretion during the working day and the exaggerated plasma NE response to a challenging task observed among TA men could be instrumental in the precipitation of acute clinical events. Eliot (1976) has proposed that excess NE secretion could be responsible for the focal myocardial necrosis that is observed in association with extreme stresses.

Furthermore, Rosenman and Friedman (1974) reported more rapid blood clotting times among TA men during periods of stress. There is extensive evidence, therefore, that TA individuals with pre-existing coronary atherosclerotic

involvement would be at greater risk than TB individuals to experience an acute occlusion of the arterial lumen via effects of stress upon the blood clotting mechanisms. Such effects could be mediated by changes in platelet function or by other effects of the stress upon the clotting mechanism. If such acute effects of stress upon blood clotting mechanisms are indeed acting to increase the risk of acute CHD events among TA individuals, it is likely that these effects are mediated via the increased sympathetic nervous responses that have been described as characteristic of TA persons (Williams, 1977).

According to Williams (1977), in addition to their effects upon clotting mechanisms, the increased catecholamine responses among TA individuals are likely associated with changes in cardiovascular function, which could be key events in the precipitation of acute CHD events. Increases in cardiac output or peripheral resistance attendant upon acute stresses could impose additional work loads upon the cardiac muscle such that the blood supply available via the atherosclerotic coronary arteries becomes insufficient to meet the metabolic needs of the muscle, the result being MI. In addition to this mechanism, stresses to which the TA person is subject that have the potential of precipitating acute CHD events, the increased sympathetic discharge could also play a role in the initiation of potentially fatal cardiac arrhythmias.

Glass (1977b) has proposed that when the active efforts of the TA person to control his environment (with the associated sympathetic activation) fail, there will occur a withdrawal, or giving up, with a possible shift to parasympathetic dominance. Glass cites evidence that such sympathetic-parasympathetic shifts are implicated in sudden death.

In addition to the behavior patterns and clinical CHD events described above, there are also behavior patterns associated with coronary atherosclerosis. Ross and Glomset (1976) proposed that the initiating event in the atherosclerotic process involves "injury" to the arterial endothelium. Such injury could result from hemodynamic events resulting in turbulence and sheer stress, from biochemical insults, and from immunologic processes. Furthermore, the response of platelets and arterial smooth muscle cells to such injury appears important, whatever the initial cause of the injury. Any effect of behavior pattern to accelerate or increase the development of atherosclerotic lesions would logically act via influences upon the arterial endothelium. The findings cited above, that TA, compared to TB patients have more severe coronary atherosclerosis on arteriography, provide circumstantial evidence that such influences are more active in the TA individual. Also, the increased platelet aggregation among TA individuals in association with the stress cited above could be one way

that behavior pattern plays a role in atherogenesis.

Despite the paucity of published evidence presently available, there is reason to postulate that hemodynamic stress may be occurring more frequently and to a greater level of intensity among TA persons. The frequent behavioral arousals that Glass (1977a) postulates to occur among TA individuals in their constant attempts to maintain their "sense of environmental control," would likely be associated with increased levels of cardiovascular response. This is strongly supported by findings of increased sympathetic nervous activity among TA subjects when challenged.

Williams (1975) has suggested two psychophysiological mechanisms whereby the interactions of the TA individual with his environment could lead to different patterns of cardiovascular activation that, via hemodynamic effects, could play a role in endothelial injury. When the outcome of such an interaction is the feeling that an emergency exists and that fight/ flight behavior is called for, the "defense reaction" is activated. This reaction is characterized by a state of emotional arousal, increased motor activity, and a cardiovascular response pattern characterized by an increase in the cardiac output, with a shunting of this increased output away from the skin and viscera to the skeletal musculature.

On the other hand, when the outcome of the interaction is a state of vigilance with attentive observation of environmental stimuli, a qualitatively different behavioral-physiological response pattern is observed: there is little emotional expression, motor activity decreases, HR (and cardiac output) decrease, and there is an active vasoconstriction in skeletal muscle as well as in skin and viscera (Williams, Bittker, Buchsbaum, & Wynne, 1975). It might be postulated that TA individuals would respond to situations calling forth either of these general behavioral-physiological response patterns to a more extreme and prolonged degree than TB persons. Furthermore, the extreme hemodynamic responses in association with such episodes might lead to more endothelial injury among TA patients, accounting for the apparent increase in coronary atherosclerosis among this group.

1.G.5 Summary

In conclusion, there are results that provide answers to the question posed in the initial paragraph (i.e., what are the psychophysiological properties of a CPBP person not present in the non-CPBP person which can lead to CHD?). Clinical, epidemiological, and laboratory results show that behavior patterns seen in certain individuals may accelerate the onset of CHD. This is evident in three major systems: biochemical and neuroendocrine; cardiovascular; and

psychomotor.

As for biochemical and neuroendocrine mechanisms, there are several pathophysiological processes involved. First, TAs exhibit an increased level of ACTH which results in increased occurrence of pigmentation and consequently leads to increased atherosclerosis.

Second, when TAs were studied in their work environment and when in competitive situations, they both excrete more NE and show a higher serum level of NE. Furthermore, during competitive situations, TAs showed increased levels of EP.

Lastly, TAs exhibit increased levels of TG and of Ch. Elevations of TG and Ch along with NE also lead to arterial damage resulting in atherosclerosis.

As mentioned earlier, there are few published studies documenting a difference between TAs and TBs with regard to psychophysiological responses. However, those that have investigated the area of cardiovascular responsivity demonstrate that TAs show more marked BP and HR responses in challenging situations than do TBs. There is a great deal of evidence suggesting that behavioral stimulation can exert a profound influence upon cardiovascular functions. Both the output/muscle vasodilation response pattern observed in TAs in conjunction with the total peripheral resistance/muscle vasoconstriction are important

contributors to the endothelial "injury" that has been proposed as the initiating event in atherogenesis.

Lastly, when the area of psychomotor/behavioral responses are considered, perceived control is the important variable. TAs initially try harder than TBs to control the environment. However, with extended exposure to an uncontrollable environment the TA exhibits a learned-helplessness pattern of response. This hyper-/hypo-responsiveness reaction with its concomitant increases in NE, Ch, ACTH, BP, HR, etc. greatly facilitates the atherosclerotic process.

Eventhough the evidence to support these pathophysiological processes in humans is still somewhat speculative, they have been well documented in animals. Considerable research on animal models has demonstrated how the above pathological processes lead to cardiovascular damage.

It should be noted that in no instance have any of the possible underlying psychophysiological or neuroendocrine mechanisms proposed to account for the association between behavior pattern and CHD been studied in conjunction with assessment of the various CHD indices to which TABP has been related. It is possible, however, to formulate hypotheses based upon what we know about the psychological characteristics of the TA person and about

psychophysiological response mechanisms.

1.H CONCEPTUALIZATION OF THE CPBP

It is now time to use the above information to evaluate existing efforts to identify the psychological dimensions underlying the established behavioral characteristics of TA persons. There have been at least four approaches to conceptualizing the TA pattern.

The first approach, component analysis, attempts to identify the core psychological elements of TA that are related to CHD. It stems from the observation that classification as TA by the SI does not require an individual to exhibit all forms of TA behavior. A TA classification, in consequence, gives little information about an individual's actual behavior. Thus, it is possible that only certain TA attributes are related to atherosclerosis and CHD. Knowledge of a global behavior pattern classification might, therefore, result in less accurate prediction of disease. For a list of TA characteristics see Table 1.2.

Support for this view comes from a factor analysis of the SI responses in the WCGS and have been extended by many researchers. The TA individual is described as having an intense drive to succeed in achievement-related activities. Therefore, TAs would be expected to work at near maximum

TABLE 1. 2 Type A Characteristics in Research Literature from 1959 to 1989:
Frequency of Citation

Characteristics cited	Frequency of citation		
	Total	1959-1974	1975-1989
Competitiveness	72	27	45
Time urgency	62	24	38
Aggressiveness	44	13	31
Drive ^a	41	22	19
Achievement striving	33	9	24
Preoccupied with/subject to deadlines	28	14	14
Ambition; desire for advancement	26	14	12
Accelerated pace	25	12	13
Impatience	24	9	15
Hostility	19	2	17
Motor mannerisms	18	11	7
Hyperalertness	14	4	10
Speech mannerisms	13	9	4
Struggle	13	6	7
Hard-driving	12	5	7
Restlessness	12	8	4
Job commitment	12	5	7
Involved in too much	11	8	3
Extremely conscientious/responsible	11	6	5
Seek recognition	10	8	2
Coping style to gain control	7	0	7
Job success	3	3	0
High productivity	3	1	2
High activity level	3	2	1
Chronic conflicts; challenge	2	2	0
Neglect of nonjob activities	2	1	1
Perfectionism; high standards	1	1	0
Anxiety	1	0	1
Unwillingness to define limits	1	0	1
Expressiveness	1	0	1
Need for power	1	0	1
Number of articles reviewed	101	44	57

^aOften used in conjunction with another characteristic, as in "competitive drive" or "aggressive drive."

Adapted from Price, (1982).

capacity even in the absence of a specific deadline for task completion (Burnam, Pennebaker, & Glass, 1975; Carver, Coleman, & Glass, 1976). By contrast, TB individuals might be expected to work as hard as their TA counterparts only when confronted by a concrete deadline. This hypothesis was confirmed in the Burnam et al., (1975) study.

In addition to being hard-driving, Friedman (1969) expanded on the achievement-striving component. He described TA individual as confidently believing that with sufficient effort he can master any task, overcome any obstacle. This thought led Carver et al., (1976) to speculate that TAs might suppress or deny feelings of fatigue to a greater extent than TB individuals in order to persist at a task and thus achieve success in its mastery.

Both of their hypotheses received support in their results. TA subjects worked at a level closer to the limits of their endurance than did TB subjects. Moreover, even as they did so, TAs suppressed feelings of fatigue to a greater extent than did their TB counterparts.

Matthews, Beane, Helmreich, and Lucker (1980) pursued this relationship of TA and achievement- striving by working at the relationship of TA and merit of work and the relationship between TA and need for achievement. As for the need for achievement, their results showed that the more TA the individual, the more likely he is to prefer

challenging tasks, to like work, and to be competitive in his orientation. Furthermore, when TA men and merit of work was compared it was shown that those TA men who scored highest on the hard-driving component of TA tended to be cited often by others and to be most productive.

A second feature of TABP is an exaggerated sense of time urgency, that is, preoccupation with deadlines and attempting to do more and more in less and less time (Gastorf, 1979). It might be expected, therefore, that the impatience of TAs would lead them to report the passage of a fixed time interval sooner than their TB counterparts. This was proven by Bortner and Rosenman (1967). Glass (1977b) devotes an entire chapter to literature that establishes this relationship. Along with the Bortner and Rosenman (1967) study additional studies show that subjects with TA traits show greater impatience and irritation when delayed in the execution of their activities than do subjects with TB traits (Friedman, 1969). From all of the studies reported in Glass (1977b), it appears that time urgency is indeed a major facet of TABP, with demonstrable effects on the perception of time, timing behavior, and interpersonal relationships. The experimental results also underscore the importance of treating TABP as an interplay of predispositions and eliciting environmental circumstances.

A third major facet of TA is hostility and aggressiveness. In a society such as ours, in which everyone can be upwardly mobile, everyone is a potential threat to a "dominant male's" position. It is no wonder that aggressive behavior is such a common feature in this country. "The best defense is a good offense" is a familiar aphorism in our society. In a highly competitive society where there is a fight for individual supremacy, where one is able to reason that his worth is greater than that of certain other persons, and where no guiding moral principle is acknowledged, there are no natural constraints on the amount or kind of aggressive behavior that can be exhibited.

Any actions that are perceived as threatening a person's self-esteem may serve as stimuli for aggressive responses. Many men who have been classified as TA report their chronic fear of being unseated by highly competitive younger men. Men who have already had an infarction all too often report fighting tooth and nail to hold their position. They do so even though they themselves often see that their position-- and their efforts to maintain it--results in excessive stress.

Alternatively, aggressive behavior may be the method by which a person attempts to conceal his vulnerability to the competitive efforts of others. If a person chronically perceives others to be threatening, and therefore

continually engages in aggressive maneuvers aimed at defending himself, he may eventually exhibit aggressiveness on a habitual basis even in the absence of threat. Often excess hostility and aggression are not always easily detected in TAs, because they often keep such affect and reactions under cover. Friedman and Rosenman (1974) suggest that a prime index of the presence of hostility is the tendency to compete with or to challenge other people.

It follows from the above discussion that negative cognitions and feelings labeled as hostility can be traced in part to the aggressive actions exhibited during competition. Isolated empirical evidence suggests that the hostility component may have its roots early in life. In two studies, for example, Siegel and Leitch (1981) and Siegel (1982) found that "frequency of feelings of anger" was one of the few items of a personality inventory that distinguished TA from TB adolescents.

Hostility has also been identified as a function of hurried, time-pressured activities: when under time pressure, a TA becomes impatient and irritable at being slowed down by either persons or things. Since almost every person and event in one's environment could be construed as an obstacle in his pursuit of excellence, or at least as a threat to his security, minor challenges are often perceived as a stimulus for hostile behavior. While there seems to be

agreement that TAs are more hostile than TBs, the judgement is based on clinical observation, and data collected in the SI. The irritation results of the interruption experiment (Glass, 1977b) provide some evidence of the aggressiveness of TA subjects, but there is obvious need for more compelling documentation. An initial experiment to test this was designed by Carver and Glass (1978). Their work showed that TAs react with enhanced aggressiveness toward another person who impedes and denigrates their efforts to perform a difficult task. In contrast, TBs showed significantly less aggression following a comparable instigation.

Is is important to note that these same factors apply to women in high-status jobs. In fact, it may be more salient in women than in men since women usually do not have the same on job social support networks as do men (i.e., the buddy systems). A study by Glass, Snyder, and Hollis (1974) supported the connection between hostility/anger and time urgency. They showed that TAs had more difficulty in solving a task requiring a delayed response than TBs. Furthermore, the TAs showed greater tension and hyperactivity than TBs and, when slowed down by another person, more pronounced behavioral signs of impatience and irritation. Another study that supports the relationship between impatience, competition, and hostility was conducted by Matthews et al., (1977). Their paper reports further

analysis of the WCGS data. Factor analysis showed that these three factors (impatience, competitive drive, and hostility) were the only ones associated with subsequent occurrence of CHD.

In addition to the association between hostility/ anger and CHD, an important factor in the relationship seems to be the repression of hostility. Kantor and Robertson's (1977) study demonstrated a well-defined, consistent and general relationship (across two studies and five social classes) between repressed hostility and the physiological risk of developing CHD. They concluded that repressed hostility over time acts as a physiological stressor, tending to raise BP and serum Ch to progressively higher levels, until, concomitantly with the anatomical changes, a coronary event becomes increasingly probable. In this sense, repressed hostility is seen as a marker of progress toward CHD status. This idea is supported by the work of Williams, Haney, Lee, Kong, Blumenthal, and Whalen (1980). In the Williams et al., (1980) study the TA patients, in contrast to the TB patients, had at least one artery with a clinically significant occlusion of 75% or greater. In addition, patients scoring higher than 10 on the Hostility scale showed a 70% rate of significant disease. Analysis of their data showed that both the TABP and Hostility score are independently related to the presence of atherosclerosis. However, hostility emerged as more strongly related to

atherosclerosis than the TABP. This can be readily explained if one conceptualizes hostility as a physiological stressor that raises BP, and Ch levels since chronic increases in both of these have been correlated with arterial damage and subsequent atherosclerosis.

In addition to the above cited literature, there is an extensive older literature that points to the characteristics of anger/hostility as important contributing factors in CHD. Within a psychoanalytic framework, Arlow (1945), Dunbar (1943) and the Mennigers (1936) emphasized the role of repressed or suppressed aggressive strivings in the development of CHD. Using Rorschach data, Kemple (1945) found that CHD patients displayed a persistent pattern of high aggression with strong needs to dominate others.

Along with these older studies of patients who already have manifest CHD, there are several more recent studies that have prospectively identified anger/hostility-related characteristics which seem to be associated with the subsequent appearance of clinically evident CHD. In one such prospective study, Ostfeld, Lebovits, and Shepelle (1975) found those who subsequently developed CHD to be more suspecting and jealous than those who remained well. In a Swedish prospective study, Theorell, Lind, and Floderus (1975) found that those who subsequently had MI responded in an affirmative manner to an item regarding becoming

"...hostile when held up in lines" more often than those who remain well.

MacDougall, Dembroski, and Krantz (1981) conducted a study with women which demonstrated that interview ratings of potential for hostility were found to correlate with both greater increases in SBP and HR. In addition these researchers showed that cigarette consumption correlated significantly with both TA and hostility. Moreover, their results showed that if one increases hostility in this TA population there is a concomitant increase in cigarette and caffeine consumption.

Another association that might exist between TA and CHD is the interference of the TAs hostility with developing an adequate social support network. Reporting that one does not have friends and family to rely on (typically called lack of social support) is related to stress symptoms as well as to early mortality. TAs might increase their susceptibility to CHD because they lack a protective mechanism such as social support (see Fig. 4). The generally hostile behavior of TAs tends to elicit hostile and aggressive reactions from others. TAs, without realizing that they have generated a great deal of the hostile reactions they perceive in others, may become increasingly convinced that they live in a hostile world.

Clearly, research is needed to explore further the physiological consequences of social support for TAs. A comparison of CHD morbidity and mortality rates in TAs as a function of different degrees of social support may increase the accuracy by which the TA concept can predict individual cases of CHD. More will be said about social support and TA behavior in the section on occupational stress.

These three factors (competitive drive, impatience, and hostility) were associated with later onset of clinical heart disease. Matthews et al., (1977) performed subsequent analysis on interview ratings and showed that only seven items discriminated CHD cases from age-matched healthy controls. Of the seven, three items were directly related to self-reports of impatience and hostility; one was concerned with self-reported competitiveness; and the remaining three dealt with voice style (vigor of response, explosive voice, and potential for hostility).

A component scoring system for the SI was developed by Dembroski et al., (1978) based on the work of Matthews et al., (1977). The dimensions that were found to predict task induced elevations in SBP and HR were rapid speech; hostile- competitive attitude; and self-reports of speed/impatience. Thus, some of the same dimensions that were prognostic of CHD in the WCGS also predicted cardiovascular changes during difficult and moderately

competitive tasks. These results take on added significance when viewed in the light of speculations about the role of episodic elevations in BP in potentiating atherosclerosis and CHD (Herd, 1978).

The second approach to conceptualizing TA comes from the work of Scherwitz et al., (1978). They identified and measured certain speech characteristics of male undergraduates that occurred continuously during the SI. These were then correlated with simultaneous changes in HR, finger pulse amplitude, and BP. TA individuals who used many self-references (I, me, my, mine) in answering the interview questions showed the highest levels of SBP during baseling and task performance. By contrast, the TB group exhibited few significant correlates of self-references. These results led them to suggest that such references measure a dimension called self-involvement--that is, the extent to which "the individual is personally involved in responding to interview themes and intense feelings" (Scherwitz et al., 1978, p. 595)--and that this dimension might account for both the speech characteristics and autonomic reactions of TA subjects.

As support for their suggestion, Scherwitz et al., (1978) discussed evidence from another literature--self-awareness theory and research (Duval & Wicklund, 1972). This literature suggests that individuals

who are accurately aware of themselves use personal pronouns frequently (Davis & Brock, 1975) and behave like TAs do in a number of respects. For example, individuals whose attention is focused on themselves are aggressive when provoked (Scheier, 1976) and compare their performance to internal standards of excellence while working on a task. Moreover, to the extent that these standards are high, salient discrepancies between performance and goals may lead to excessive striving, frustration, and a sense of helplessness. Indeed, there is recent evidence that like TAs, self-focused persons try harder than others to succeed after initial failure (Carver & Scheier, 1981).

The third approach, and by far the most systematic and comprehensive effort to conceptualize TA comes from the work of Glass and his associates (1977a, 1977b). These investigators reported experimental evidence showing that TAs assessed by the JAS work hard to succeed, suppress subjective states (such as fatigue) that might interfere with task performance, and conduct their activities at a rapid pace (Glass, 1977b). Glass has suggested that these behaviors represent an attempt by TA persons to assert and maintain control over stressful aspects of their environment (i.e., uncontrollable events that are perceived as potentially harmful). Furthermore, if that is the case, when TAs are faced with a stressful event, they should struggle to control that event and, in consequence, appear

hard-driving and aggressive, easily annoyed, and competitive. If their efforts to control are met with repeated failure, however, they should give up responding and act helpless (Glass, 1977a). In sum, the uncontrollability approach suggests that TA behaviors reflect a specific way of coping with stressful aspects of the environment.

Central to the uncontrollability approach to TA behavior are data concerning the physiological and neuroendocrine processes that accompany both attempts to exert control and the absence of such efforts (see Mechanisms section). Data indicate that active coping with a stressor increases sympathetic activity and the discharge of catecholamines such as NE (Weiss, Stone, & Harrell, 1970). High levels of catecholamines may elevate BP, accelerate the rate of arterial damage, induce myocardial lesions, and facilitate the occurrence of fatal cardiac arrhythmias (e.g., Eliot, 1979; Haft, 1974; Raab, Chaplin, & Bajusz, 1969). Catecholamines also potentiate the aggregation of blood platelets, which is considered an important factor in atherogenesis as well as in the genesis of thrombosis (Ardlee, Glew, & Schwartz, 1966). In addition, they promote lipid mobilization (Herd, 1978); for example, they stimulate a chain of metabolic events resulting in free fatty acids, which are in turn taken up by the liver and formed into TTGs and selected as a component

of very-low-density lipoproteins. Levels of very-low-density lipoprotein are positively related to incidence of CHD (Marx & Kolata, 1978). Other data show that severe depletion of NE, with a possible shift to parasympathetic dominance, is often associated with helplessness and giving up (Weiss, Glass, & Pohroecky, 1976). It has been suggested that abrupt shifts between sympathetic and parasympathetic activity may be implicated in the major cardiovascular disorders, including sudden death (Engle, 1970; Glass, 1977b). If a chronic struggle to exert environmental control accounts for TA behavior, the foregoing physiological processes would help to explain TA's heightened risk for cardiovascular disease. Thus, an uncontrollability dimension underlying the TA pattern helps to explicate not only their behavioral characteristics but also their coronary-prone tendencies.

The helplessness results reported above take on added significance when viewed in the light of recent work on the relationship between disease and the magnitude of changes in an individual's life. Early research in this area suggested that life events could be positive or negative and still lead to the onset of disease; the important factor, it was believed, was the amount of change (e.g., Holmes & Rahe, 1967). More recent studies indicate, however, that events must be negative in order to potentiate illness (Dohrenwend & Dohrenwend, 1974), and there was even the suggestion that

uncontrollability and helplessness induced by certain types of negative life changes are the critical variables in facilitating the onset of some diseases (Paykel, 1974).

Most of us have from time to time been confronted with salient events over which we have little or no control. Rejection by a loved one, a sudden financial setback, or a loss in occupational prestige, are all aspects of our lives that can only rarely be affected by our own actions. These losses often result in feelings of helplessness, depression, and a tendency to give up direct efforts to cope with the environment (Seligman, 1975). There are also indications that helplessness-inducing events which are prominent in an individual's life precede the onset of clinical CHD. Glass (1977b) cites research showing that death of a close relative increases the likelihood of death in next of kin, usually due to some form of cardiovascular ailment (Parkes, Benjamin, & Fitzgerald, 1969). In this connection, consideration was also given to the work of Engel (1968) and Green, Goldstein, and Moss (1972), which points to helplessness and depression as precursors of sudden death from CHD.

Of equal relevance to this relationship is the research of Holmes, Rahe, and Theorell concerning life change and the occurrence of cardiovascular pathology in a subsequent observation period (Theorell 1980; Theorell & Rahe, 1971).

For example, data from survivors of MI show marked elevations in the total number of significant life changes during a 6-month period prior to infarction, compared to life changes in the same time interval one year earlier. Other studies indicate that the prodromal period in which change occurs is often as long as one year (Theorell, 1980). What has not been shown is whether or not this increase is related to an individual's behavioral style. Also not answered is how do TAs and TBs respond to life changes and is there a difference in their response? Work by Glass and his associates (Glass, 1977b) provides insight into the latter question. These investigators found that coronary patients experienced more losses than healthy controls, however, negative experiences that were not classified as losses occurred with equal frequency to coronary patients as to hospitalized and non-hospitalized controls. Glass (1977b) interpreted these data as supporting the notion that the TA individual suffers considerable stress in times of helplessness (viz., after suffering a loss). This suggests that the TA individual's sense of his/her control over life events may be an important factor to consider when investigating the nature of the life change/stress relationship.

To answer the question of whether or not an increase in the number of life events is related to an individual's behavioral style, Suls, Gastorf, and Whitenberg (1979) targeted a population of young adults who demonstrated the CPBP but who have not yet developed heart disease. The results of their study indicated that TAs report the occurrence of more life events than TBs. In addition, examination of the perceived characteristics of the life events revealed different patterns for TAs and TBs. Life events seen as undesirable, unexpected, and ambiguous in terms of perceived control were positively correlated with increased distress for TAs. TBs, on the other hand, were less distressed the more the event was perceived to be beyond their control.

While these data are certainly not conclusive, they do suggest the possibility that helplessness-inducing life events are precursors to CHD. But why CHD and not some other disorder? In other words, what are the factors that might interact with helplessness to produce CHD? Glass (1977c) suggests that the TABP may be a predisposing condition that mediates the relationship between helplessness and CHD. The research described thus far indicates that extended experience with salient uncontrollable stress results in enhanced vulnerability to helplessness among TAs. It may be, therefore, that the specific interaction of TA and helplessness-inducing life

events is a precursor to clinical CHD.

A test of this hypothesis came in what is known as the Houston study (see Glass, 1977b). In this study, three basic samples were used: (1) a group of 45 patients in the coronary care unit of the V.A. hospital in Houston; (2) 77 patients in the general-medical ward-- the hospitalized control group; and (3) 50 building-maintenance employees--the "healthy" non-hospitalized controls. The three groups were matched in terms of social class, race, and religion. The instruments used were the JAS and a modified version of the Schedule of Recent Experience used in research on stressful life change (Holmes & Rahe, 1967). A loss index was computed consisting of the percentage of persons in each sample who endorsed one or more of 10 specific events in the list of 47. These 10 items were agreed to reflect stressful life events over which minimal control could be exerted, for example, "death of a close family member," "being fired," and "large decline in financial status."

Analysis of the JAS data revealed that coronary patients had significantly higher TA scores than either the hospitalized or non-hospitalized controls. As for the loss index, a reliably higher percentage of each patient group experienced at least one loss compared to healthy controls.

Another retrospective study by Orth-Gomer Ahlbom, and Theorell (1980) reported a study of 50 men with a past MI or angina; 50 men with excessive risk indicators for ischemic heart disease but without manifestations of illness; and 50 healthy controls without risk indicators. All of them were matched with regard to age, job position, and kind of job. It was demonstrated that "worst stressful period," mainly due to work stressors, was much more frequently reported during the 5 years preceding onset of ischemic heart disease (IHD) than during the same chronological periods in the other two groups.

Haney (1980) reviews the vast literature that has developed regarding the relationship of life events and CHD. The major findings reported in his paper indicate that (1) coronary patients have higher average JAS scores than do either hospitalized or non-hospitalized control groups; (2) in contrast to healthy controls, a greater proportion of hospitalized patients experienced stressful losses in their lives during a one-year prodromal period. It may be suggested, therefore, that CHD is more likely to be found among TAs than among TBs, providing an excess of life events occur which are interpretable as losses of environmental control. This conclusion and the results on which it is based provide external validity for Glass's (1977b) laboratory-based notions about TA as a style of coping with uncontrollability. It appears that the CPBP and real-life

analogs of helplessness- inducing stressful events characterize patients with CHD relative to noncoronary subjects.

A fourth approach to conceptualizing TA comes from the work of Matthews and her colleagues on the origins of TA behavior. Matthews' approach is mainly a developmental one and feeds directly into the next section on development. One reason for their interest is that understandably developmental factors may assist in conceptualizing TA in mature adults. In any case, this approach gains significance from evidence that atherosclerosis is a life-long process that apparently begins in the first or second decade of life (Enos, Holmes, & Beyer, 1953; McNamara, Molot, Strempel, & Cutting, 1971), and that adults and children who exhibit overt TA behaviors have other behavioral and perhaps also physiological similarities (Lawler, Allen, Critcher, & Standard, 1981; Matthews & Angulo, 1980; Matthews & Volkin, 1981).

Matthews and Volkin (1981) have suggested that one origin of TA behavior is a combination of a strong value in productivity and ambiguous standards for evaluating that productivity. This combination of events should lead to a sense of time passing rapidly (Glass, 1977b). A sense of time passing covaries with the complexity and amount of information coded and stored during a given interval

(Ornstien, 1969). This complexity should increase with the degree of ambiguity for evaluating task performance. Hence, ambiguous standards should both elicit a sense that time is passing rapidly and also, provided that productivity is valued, heighten the impression that time is insufficient to accomplish all of one's goals.

Situations that do not yield clear standards for evaluating performances are also proposed to elicit chronic achievement-striving. It has been suggested that individuals have a basic drive to evaluate their abilities. Thus, they engage in a variety of information-seeking behavior that is designed to determine how good they are at a given activity. Initially, objective and tangible bases for evaluation are sought. If such criteria are ambiguous or unavailable, people look to others for subjective standards of ability levels. Generally speaking, they are thought to compare their performance to someone who is similiar, but slightly better than they are, on a given dimension (Suls, 1977). Provided that they value productivity, they should plan to exert even more effort on the next task, which is, of course, yet another ambiguous criterion. Thus, barring the development of more clearly defined internal or external standards, this pattern of behavior is likely to be a self-perpetuating one. Moreover, perceptions of a performance as incomplete or a failure are difficult to encode; consequently, the sense that time is

passing rapidly may further intensify (Matthews & Angulo, 1980).

Matthews further points out that these ideas may also help to explain fluctuations of TA behavior in adulthood. For example, assume that an adult is hired to do a job involving the absence of clear standards for performance evaluation. According to the "ambiguous standard" point of view, the individual would be expected to exhibit more TA behavior than usual until a clear standard is set or until some clear external reward is given that signifies that previous behavior was adequate.

1.H.1 Summary

There are four approaches to the conceptualization of the TABP. The first approach, component analysis, attempts to identify the core psychological elements of the TABP that are related to CHD. This approach is important for several reasons. For example, not everyone exhibits all of the characteristics of the overall TABP. Furthermore, TA individuals possess the TA characteristics in differing degrees of severity. Lastly, not all of the components of the TABP are associated with CHD. In fact, only three components seem to be correlated with CHD--- competitive drive, impatience, and hostility.

A second approach to conceptualizing the TABP deals with speech characteristics. Investigators measured speech characteristics that accompany changes in HR and BP and found that TAs who use many self-referent statements had the highest levels of SBP during baseline and task performance. This approach taps into the self-involvement dimension of TAs. Research indicates that self-involved persons try harder to succeed than others.

The third approach is the most systematic and comprehensive approach and deals with TAs attempts to control their environment. TAs work harder to succeed, suppress subjective states (i.e., fatigue) that might interfere with performance and perform at a rapid pace as compared to their TB counterparts. As a consequence, they appear hard-driving and aggressive, easily annoyed, and competitive. But, if their efforts to control are met with repeated failure, they give up responding and act helpless.

There are significant physiological and neuroendocrine changes than accompany this attempt to control. Active coping (the hyper-responsive phase) increases sympathetic activity and the discharge of catecholamines. High levels of catecholamines elevate BP, accelerate the rate of arterial damage, induce MI, and facilitate the occurrence of fatal cardiac arrhythmias. When the TA individual gives up there is a shift to parasympathetic activity along with a

severe depletion of NE. It has been suggested that abrupt shifts between sympathetic and parasympathetic activity may be implicated in major CVD, including sudden death.

The fourth and final approach deals with the developmental aspects of the TABP. This approach gains significance when one considers that the atherosclerotic process is a life-long one that begins in the first or second decade of life. It is suggested that the origin of the TABP is a combination of a strong value in productivity and ambiguous standards for evaluating that productivity. Ambiguous situations produce a sense of time passing rapidly and elicits the hard-driving, rapid pace of performance so common to TAs. This approach will be further elaborated on in the next section of this review.

1.1 DEVELOPMENT: CPBP--DEVELOPMENTAL AND CULTURAL CONSIDERATIONS

Considerable research attention has been given to the identification of a CPBP, to the development of techniques for classifying with respect to the presence and degree of this behavior pattern, and to establishing a "risk factor" relationship between this behavior pattern and various forms of CHD (Friedman & Rosenman, 1974; Glass, 1977b; Jenkins, 1976; Zyzanski et al., 1976). However, little attention has been given to issues concerning the development of this

pattern of behavior, e.g., whether it is primarily a genetically determined or acquired (learned) pattern, and to what extent the behavior pattern is characteristic of persons other than white, middle-class, middle-aged males in the United States. This section discusses the following: (1) what is currently known sex differences and genetic influences on the TABP, (2) the occurrence of TABP in children, and (3) cultural influences on the development of TA behavior.

1.I.1 (1) Sex Differences

The following section of this review will be devoted to sex differences and will include cognitive, behavioral and environmental factors. Therefore, the coverage of this topic here will serve as a brief introduction for this section.

For half of the American women who are not currently employed, the CPBP appears to be adequately assessed by revised forms of the SI and the JAS, which omit questions on current employment. However, research has not yet established adequate validity of the SI, and JAS, and other methods of assessing the behavior pattern in women, and whether these measures predict CHD in women. However, the data that are available suggest that the CPBP is correlated with the prevalence of CHD in women (Rosenman, & Friedman,

1961), including coronary atherosclerosis. In women, as in men, most of the risk associated with the TABP apparently does not act via the standard risk factors (Shekelle et al., 1976). Furthermore, the CPBP has been found to be more prevalent among employed women than among housewives (Haynes et al., 1978; Waldron, 1977). Additional research by Waldron suggests that women who display the TABP may be more likely than TB women to seek employment, even when financial pressures to do so are not strong (Waldron, 1978).

The CPBP as measured by existing instruments appears to be more prevalent among men than among women (Haynes et al., 1978; Waldron, 1976, 1978). This sex difference in behavior pattern may contribute to higher rates of CHD for men (Waldron, 1976). Also sex differences in behavior pattern probably reflect both genetic differences in aggressiveness and socialization, e.g., in the encouragement of competitive achievement (Waldron, 1978). Sex differences in socialization might be expected, since the TABP may to some extent be associated with success in the traditional male role (e.g., as reflected in high occupational status), but not with success in traditional female roles (Shekelle et al., 1976).

Despite the problems mentioned, the interview and the JAS both appear to provide valid measures of the CPBP in women. In one sample for which scores on the revised JAS

and interview ratings are both available, these measures are positively correlated, both for housewives who completed the N form and for employed women who completed the E form (Waldron, 1977). More importantly, at least four studies have shown that the measures of the CPBP are related to the prevalence of CHD in women (Bengtsson et al., 1973; Haynes et al., 1978; Kenigsberg et al., 1974; Rosenman & Friedman, 1961).

Positive evidence of a relationship between the CPBP and the prevalence of CHD has been found in all four studies just mentioned. In the earliest study, Rosenman and Friedman (1961) compared samples of extreme TA and TB women and found that the prevalence of clinical CHD was higher in the former. In a case-control study of patients hospitalized for CHD or for surgery and trauma, Kenigsberg et al., (1974) found that the women with CHD scored higher on the TA scale of the JAS than the controls. More recently, Haynes et al., (1978) used a scale composed of items that were administered in the Framingham study. Women judged to be TA (in the upper 50% of scores on this scale) had a significantly higher prevalence of CHD than TBs. Finally, Blumenthal et al., (1975) found that for women undergoing coronary angiography, those rated TA in the interview had a significantly higher prevalence of coronary atherosclerosis than those rated TB.

These studies indicate that for women, as for men, the CPBP is correlated with a higher prevalence of CHD, including coronary atherosclerosis. The findings for women parallel the findings for men in one additional respect. The CPBP does not appear to exert its primary pathophysiological effect via the standard risk factors (Rosenman, Brand, Jenkins, Friedman, Strauss, & Wurn, 1975). Haynes et al., (1978) found no relationship between their TA score and a risk score for CHD calculated on the basis of standard risk factors such as serum Ch, BP, and smoking. Shekelle et al., (1976) reported that for employed women, the JAS TA score has no significant relationship to Ch levels; but a positive relationship with BP in women aged 45-64. It is important for the hypothesis that hyperactivity of the sympathetic nervous system mediates the relation between TA and increased risk for CHD, and that both male and female TAs respond with greater cardiovascular activity to situations that involve personal challenge or threat. In one of the few published studies relevant to this issue, Manuck, Craft, and Gold (1978) assessed the physiological responses of TA and TB males and females during task performance and found differences between male TAs and TBs but not between female TAs and TBs. However, the task in the Manuck et al., (1978) study may have caused the females to be uncertain about their performance due to beliefs concerning sex differences in cognitive abilities

(see Maccoby & Jacklin, 1974). As a result, the female TAs in the Manuck et al., (1978) study may not have exerted more effort than female TBs, and therefore, differences between female TAs and TBs in cardiovascular response did not emerge.

In contrast, no sex differences in the cardiovascular responses of TA male and female subjects to social interaction were reported by Van Egeren (1979a, 1979b). The social interactions may have been equally challenging for TA males and females. Similarly, Mac Dougall et al., (1981) report that female TAs relative to TBs respond with greater cardiovascular arousal to a demanding social interaction. This finding was similar to that found earlier for male TAs and TBs in the same kind of situation (Dembroski et al., 1979).

Theoretically, it would be important to further evaluate whether there are sex differences between TAs and TBs to challenging or threatening situations. Jorgensen and Houston (1981) undertook a study to investigate potential differences in cardiovascular responses between TA and TB males and females using three demanding tasks that previous research has shown to elicit appreciable cardiovascular responses and/or to be sensitive to individual differences in cardiovascular activity. Their results revealed that, compared to TB subjects, TA subjects manifested higher DBP

and higher pulse rates. Furthermore, no significant interactions were found between sex and A/B type. These results are congruent with the notion that greater sympathetic nervous system activity among TA individuals, both men and women, contributes to greater coronary atherosclerosis and CHD in this group.

Why is the CPBP more common among men than women? Genetic differences appear to make some contribution to sex differences in aggressiveness, but genetic differences have not been shown to play a role in sex differences in other components of the CPBP (Maccoby & Jacklin, 1974). Twin studies of the CPBP suggests that genetic factors may make only a small contribution to individual differences in this behavior pattern (Matthews & Krantz, 1976; Rahe & Rosenman, 1975). The more likely explanation for the observed sex difference in the TABP is that the differences in the socialization of boys and girls probably contribute to sex differences in the CPBP. For example, sex differences in competitiveness appear to be fostered by parents and schools who have typically pushed boys to achieve in the occupational world and girls to seek success in the less competitive family sphere (Waldron, 1976).

It seems likely that the CPBP is reinforced more in males than in females, since this hard-driving, aggressive style of behavior appears to contribute to success in

traditional male roles, but not in traditional female roles. For example, adults who are more TA have repeatedly been found to have more education, higher status occupations, and more income (Mettlin, 1976; Shekelle et al., 1976; Waldron, 1976; Zyzanski, 1977). Limited evidence suggests that this may be due in part to greater upward socioeconomic mobility of the more TA individual. Mettlin (1976) has reported a correlation of +0.23 between TA score and an increase in income over a ten-year period.

In contrast, the CPBP does not appear to contribute significantly to success in traditional female roles. Among women in college, those who are more TA are not more likely to have a boyfriend or more frequent dates, nor are they more satisfied with their relationships with men (Waldron, 1978). Among middle-aged women, those who are more TA are not likely to be married, and if married, they have husbands of equal or lower status than the husbands of less TA women (Waldron, 1978). Furthermore, as Waldron (1978) points out, middle-aged men who are more TA are more likely to be married. If, as these data suggest, the CPBP contributes more to success in traditional male roles than in traditional female roles, it would not be surprising to find that such behavior is encouraged more in boys than in girls.

This is especially true in Western societies where the TABP appears to coincide in many respects with the stereotypic masculine roles. For example, experimental research has found TAs to be aggressive (Carver & Glass, 1978). Similarly, males are also more aggressive than females, according to a review of nearly 2,000 studies of sex differences in behavior (Maccoby & Jacklin, 1974). Indeed, it does not seem unreasonable to say that the word aggressive is firmly associated in most people's minds with masculinity.

Aggressiveness is not the only characteristic of the TABP that has a counterpart in the masculine stereotype, however. Exaggerated achievement striving is also characteristic of TAs (Glass, 1977b), and a strong work orientation, including a driving ambition to better one's status and income, is often associated with masculinity. This would seem to stem from the male's culturally established role as a provider.

In sum, the behavioral style labeled TA may be construed as being consistent with a number of characteristics that are commonly identified in our society as "masculine." While this seems plausible, until DeGregorio and Carver (1980) no research had examined the relationship between TA and masculinity. The results of the DeGregorio and Carver (1980) study showed that TA had adverse

implications for adjustment within the realm of social behavior when taken in conjunction with low masculinity. This combination yielded social anxiety and depression among women. If one accepts the notion that our society expects women to be successful in social interaction, but demands less success in this domain from men, then the finding that women and not men become anxious and depressed is understandable.

Support for DeGregorio and Carver's (1980) hypothesis that CPBP is a masculine sex-role characteristic comes from a study done by Nix and Lohr (1981). These investigators studied a population of college students and found that sex did not predict CPBP. They did show, however, that for both males and females masculinity score showed a significant positive correlation with TA score. Furthermore, for both sexes, feminine sex-role characteristics are unrelated to TA score. Additional support also comes from a study by Batlis and Small (1982) who showed that identification with masculine but not feminine traits was correlated with the CPBP.

The topic of sex differences was only briefly discussed in this section because the next major section of this review covers this topic in greater detail.

1.1.2 (2) Genetic Contributions And CPBP In Children

Very little attention has been given to the significance of past events in affecting current behavior. Yet the conditions that foster TABP during the first and second decades of life, may create a basis for CHD in the fourth or fifth decades. Unfortunately, there is little in the way of systematic data on the psychological conditions in an individual's life history that may lead to the emergence of TA, and there is no data bearing the role of biological (i.e., genetic) factors in TA development. Indeed, virtually no information exists with respect to the age level at which TABP can first be observed.

At present, based on conclusions drawn from either the SI (Rosenman et al., 1975) or the JAS assessment of TA characteristics (Matthews & Krantz, 1976), there is no evidence for heritability of the CPBP. However, factor H (hard-driving) on the JAS appears to have a modest genetic component in a sample of 56 pairs of 20- year-old male and female twins (Rosenman et al., 1974).

Obviously, possible genetic contributions are relevant to our understanding of the etiology of CPBP. The child-rearing practices associated with the development of TA behavior may be elicited by observing the characteristic behavior of the children, rather than vice versa. Nonetheless, research by Matthews suggests that escalating

parental standards of performance might play a role in the etiology of CPBP, particularly in the achievement-striving component (Matthews, Glass, & Richins, 1977). Psychological research has shown that high achievement-motivation is associated with the following parental attributes: high expectations and aspirations, frequent approval and disapproval, competitiveness, and authoritarian discipline techniques (Baumrind, 1971; Rosen & D'Andrade, 1959). The pattern of maternal and parental interactions with high need achievement children differ according to the sex of the child (Hoffman, 1972). Furthermore, achievement behavior is relatively stable over time for both boys and girls.

Fundamental to this issue is the question of how to decide when a youngster is TA or TB. What criteria can be used for making this classification? How reliable is the assessment, particularly at age levels below 8 or 9 years when personality characteristics show considerable variability? A number of investigators have, in fact, distinguished stable individual differences in the cognitive styles of children that are reminiscent of the A-B classification. For example, Kagan and his associates (Kagan, Moss & Sigel, 1963; Kagan, Rosman, Day, Albert, & Phillips, 1964) discuss the difference between "reflective" children, who inhibit their initial impulses, and "impulsive" children, who respond with shorter latencies and higher frequencies of errors on cognitive tasks. These

results suggest that judgments of the vigor and tempo of a child's responses might be used, in part, for diagnosing his or her position of the A-B continuum. Still another approach to the measurement of TA in children comes from the work of Bortner (see Bortner & Rosenman, 1967; Bortner, Rosenman, & Friedman, 1970), who uses a battery of cognitive and psychomotor tests that, in adults, yield a TA classification that has a modest agreement with diagnoses made on the basis of the SI. However, since Bortner's tests are relatively simple, they have the virtue of being easily adapted to use with young children.

Several other assessment methods for detecting TA in children are currently being developed. Butensky, Faralli, Heebner, & Waldron, 1976) have adapted a ten-question interview for children from the adult SI and JAS. This interview procedure has several positive features for the assessment of children's behavior patterns. First, according to Rosenman and Friedman (1974), TABP is displayed by susceptible individuals only in the appropriately challenging environment. The interview provides this environment. For example, the hesitancy of the interviewer at several points can elicit the impatience of TA children. The challenging of several of the responses by the interviewer can elicit competitiveness. Second, the interviewer is an observer of the child's TABP in the interview and can check the accuracy of the child's

self-perception.

Another assessment method is the Matthews Youth Test for Health, or MYTH (Matthews et al., 1977). It contains nine rating scales of the child's competitiveness, impatience, speed, and achievement-striving displayed in the classroom. The child's classroom teacher completes the ratings of the frequency of specific behaviors on a scale of one (almost always) to five (nearly never). The lower the score, the more TA the child.

As the preceeding information suggests, environmental factors act, at a minimum, as eliciting stimuli. As has been mentioned, the behavior pattern appears when the milieu presents suitable threats to the individual's sense of control. Of somewhat greater significance for an environmental hypothesis are the strong data showing mother-daughter and father-son similiarities in JAS scores. Although genetic factors might conceivably be at work here, the results are also consistent with the notion that modeling processes and/or child-rearing practices may contribute to the development of TA. The developmental literature documents that the acquisition of internal values and overt behavior are determined by parental role models.

Age, social class, and child-parent relationships have been investigated as potential contributors to TA in children. The relationship of age and TA is unclear. However, Butensky et al., (1976) did find that children and teenagers from suburban, middle-class homes were more TA than age- and sex-matched counterparts from rural, working class homes.

A frequently studied and obvious factor in personality and social development is the parent-child relationship. Several theorists have suggested that parents might serve as a model of TA for their children. Thus, parents and children should be similar on the TA dimension. The available evidence suggests modest similarity when both the TA measurement technique is identical for parents and their children and when the children are older than 11 (Bortner et al., 1967; Matthews & Krantz, 1976). When the measurement technique is different for parents and their children and/or the children are younger than 11, there is no relationship between their scores (Matthews et al., 1977; Matthews & Glass, 1977).

Child-rearing practices of the parents are likely to play a critical role in the development of TA. TA adults and children are hyper-responsive to losses of control (Krantz, Glass, & Snyder, 1974; Matthews & Glass, 1977). Disapproval or loss of approval is conceptually analogous to

a loss of control. Perhaps the upbringing of TAs is distinguished by disapproval or losses of approval. In addition, to produce a child struggling to achieve ever-escalating goals, approval should be contingent on improvement in speed or accuracy of performance. If the above arguments are true, then parental child-rearing practices associated with TA children should be characterized by frequent use of disapproval and approval contingent upon improving performance relative to the children's previous performance or the standards of others.

There is evidence consistent with the above formulations. TA college students report that they evaluate their performance relative to others more often than do TBs (Butensky et al., 1976). Furthermore, in contrast to TBs, TA college students report that they feel guilty when they do not meet their parent's approval and that their parents are more strict. Verhoff (1969) suggested that considerable parental reinforcement for relative performance evaluation can cause the development of social comparison as a general disposition in young children. Finally, TA and TB male children ages 4-10 were observed while working with their mothers on three psychomotor tasks. Mothers of extreme TA children more frequently disapproved and encouraged them to try harder following a good performance than the mothers of extreme TBs. In addition, mothers less frequently evaluated TA children's performance positively in contrast to TBs

(Matthews et al., 1977).

1.1.3 (3) Cultural Influences

Research has now shown that men characterized as having the CPBP have approximately twice the risk of developing CHD as men not classified as TA. The TA person has been described as competitive and hard-driving, with a continuous sense of time urgency. His job is the primary focus of his life, and he cannot devote too many hours to it. His speed orientation and impatience are extreme, to the point of doing two things at once when possible.

It should be emphasized, however, that such men describe themselves as eager and challenged, rising to meet the competition. They claim to thrive on the pace they set for themselves, and only wish that there was more time to accomplish their job goals. In cultural terms, these men may be seen as overdrawn but accurate images of the Western (particularly American) self-made businessman, living to the fullest the value ideal that you can become anything you desire if you are willing to work hard enough for it. Certainly, middle-aged employed white men in this country are at high risk for CHD. However, if we identify a behavior pattern that is so clearly compatible with the cultural setting in which they are functioning, we need to ask whether TA behavior is only a reflection of a life-style

characteristic of the middle-aged American male environment, or whether it reflects a behavior pattern of high risk for CHD independent of cultural environment.

It is possible to envision a "core" of TA behavior that transcends any particular sociocultural environment and is always associated with elevated risk of CHD. If there is such a common core to the TABP, the next question becomes what is its prevalence in different groups? There are wide differences in rates of CHD among groups and between countries. Perhaps a more thorough understanding of the nature and universality of TA behavior can help clarify our understanding of these differences. Unfortunately, such information is only beginning to become available from studies of TA behavior among women, and among men in other countries.

One way to shed some light on this problem is to look for the "natural experiment" in which there is a population where the degree of Western vs non-Western culture varies, and where information on the TA characteristic is also available. In such a population, it would be possible to determine the relative independence of TABP and cultural context in relation to CHD. Thus, if cultural environments can be identified where all aspects of the "American ideal" are not present, analysis can be made of the association of TA characteristics with different cultural characteristics.

Japanese-Americans provide just such an experimental opportunity. Most Japanese migrants to the U.S. have come during the last 100 years and have settled permanently in Hawaii and California. They come from a cultural environment that is clearly modern and industrialized, with employment and occupational standards based on an educational achievement system similiar to those of Western countries. However, the Japanese cultural orientation differs from a Western one in several major ways. For example, the highest value is placed on the well-being of the group rather than the individual (DeVos, 1973). Achievement and accomplishment are valued, but as reflections of credit to the family or work group. Selfish individual achievement efforts would be disruptive to the primary goal of harmony within each group. So, the Japanese value educational achievement and hard work, but cooperatively rather than competitively. Rewards, then, are defined in terms of working with others toward a common goal, rather than, as in Western culture, competing with others to reach a personal goal. Japanese who have migrated to the U.S. have achieved an enviable record of educational and occupational accomplishments, but they have done so because "they embody middle class ideals (of hard work, etc.), which are also expressions of Japanese values" (Caudill & DeVos, 1956).

As part of an international collaborative study of CHD among Japanese in Japan, Hawaii, and California (Cohen, Syme, Jenkins, Kagan, & Zyzanski, 1979; Kagan, Harris, & Winkelstein, 1974), 2,437 men in the Hawaii cohort were administered the JAS questionnaire during their initial examinations during 1967-68. Each man also completed questionnaire information on demographic, social, dietary, and health history items, and completed a physical examination for CHD that included an EKG. Subsequent morbidity was determined by repeat examination and hospital surveillance; mortality information has also been obtained. As one might expect, the incidence of TABP in this population was fairly rare (less than 20%). Furthermore, while the prevalence of CHD was higher among the TA Japanese Americans as compared to the TB individuals, and the difference was statistically significant, the relationship was not so great as has been found in earlier research among Western populations (Brand, 1978). The findings from this study of the Japanese in Hawaii, therefore, suggest that in another mixed cultural setting, the pattern of responses to the JAS would be different and reflective of patterns in that cultural milieu.

Another issue now emerges, that of whether TABP has the same relationship to CHD in different cultural settings. Again, studies to date of TABP and CHD have assessed this relationship within the context of a particular modern

industrialized culture, namely, the American business world. Studies of modern industrialized cultures have observed, however, that this setting is itself conducive to increased disease risk. The stressful effects of the rapid social and cultural mobility found in such settings have been associated with increased CHD risk (House, 1974). Such rapid sociocultural change in an environment is hypothesized to be stressful for two reasons: because individuals are subjected to new and unknown expectations and demands (Syme, Borhani, & Buechley, 1966; Syme, Hyman, & Enterline, 1964), and because these new demands occur at the very time when prior social and cultural support systems, which might have previously been able to help meet these demands, have been lost or left behind (Cassel, 1976).

The epidemiologic literature dealing with the possible relationship between social status and CHD remains inconclusive despite fifty years of empirical investigations. Until recently, inconsistent findings regarding the association between social status and CHD have been explained primarily in terms of methodological differences among studies. However, a closer examination of selected findings reveals that the association may have changed from positive (increasing risk with higher social status) to negative (increasing risk with lower social status) in certain urban populations as the absolute rate of CHD was also changing, following a period of rapid

socio-ecologic change or "modernization" (Jenkins, 1976).

Morgenstern (1980) undertook a study to test the hypothesis that CHD is a disease that characterizes the "modernization" of a society during and immediately after a period of rapid industrial growth and urbanization. In certain cultures the result of these socio-ecologic changes appears to be the increased interdependence of people who do not know each other and who are in competition for limited resources. Because the development of the modern personality and life style within a given population is strongly influenced by such personal factors as amount of formal education and the type of occupation (Inkeles & Smith, 1974), the extent of individual modernity should be closely related to social status. In fact, others have shown that higher status persons become engaged in the modern way of life before lower status persons (Inkeles & Smith, 1974).

Morgenstern (1980) studied a white adult population of a rural county in Georgia between 1960 and 1974. He found an increase in the association between social status and CHD which was most dramatic among men under the age of 55. Furthermore, Morgenstern's (1980) evidence shows that the changing effect of social status was partially due to differential changes in certain biological risk factors of CHD, as intervening factors, particularly BP.

This increase in mortality rate from CHD has been seen in other countries as well. Over the past 40 years in England and Wales the rise in mortality from CHD has continued unabated (Rose & Marmont, 1981). In addition to this finding, these researchers showed that the incidence of CHD in women has also increased over the last 40 years.

In the last two decades considerable clinical and epidemiological data have accumulated implicating certain psychological factors in the development of CHD. One such factor that has been considered is social facilitation (Gastorf, Suls, & Sanders, 1980). The social facilitation phenomenon refers to the fact that working in the presence of an audience or co-workers leads to improved performance of well-learned (simple) tasks and impaired performance of poorly learned (complex) tasks (Zajonc, 1965). Social facilitation effects should be manifested most markedly by individuals who are especially concerned about evaluation of their task performance and about social comparison with others. Such tendencies may be exhibited in individuals characterized as possessing the TABP. The study by Gastorf et al., (1980) showed that TAs performance on a simple task was facilitated by the presence of either a similiar or superior coactor, whereas the presence of coactors impaired performance on a complex task. TBs showed weak and nonsignificant facilitation effects that occurred only in the presence of similiar coactors. Their results support

the fact that TAs are concerned about evaluation, achievement, and social comparison.

1.1.4 Summary

In conclusion, it seems obvious that little attention has been given to issues concerning the development of the TABP. It is not yet known whether the TABP is genetic or whether it is acquired. In addition, researchers are just beginning to study different populations in order to discover to what extent the TABP is characteristic of populations other than white, middle-aged, middle-class, American males. Studing other populations has however, been problematic. Assessment instruments have only recently been standardized on these other populations.

One population that has been studied, to a limited extent, is females. For employed females, the JAS assesses the TABP quite reliably. In this group, the TABP appears to be as prevalent as in their male counterparts. At present, the TABP is more common in males than in females. This appears to be due to our socialization process. That is, the CPBP is more reinforced in males than in females. For example, TA does not seem to contribute to success in traditional female roles. Among college women, those who are TA are less likely to have a boyfriend and usually less satisfied with their relationships with men. In addition,

among middle-aged women, whose who are TA are less likely to be married.

When considering developmental issues, attention must be given to genetic factors. This is important because conditions that foster the TABP during the first and second decades of life may create a basis for CHD in the fourth and fifth decades. At present, there is no evidence for heritability of the TABP, with one exception. The hard-driving factor as measured by the JAS appears to have a modest genetic component.

In addition, child-rearing practices may be associated with the TABP, particularly the achievement-striving component. Parents who display high expectations and aspirations, frequent approval and disapproval, competitiveness, and authoritarian discipline techniques seem to have children who are more TA than parents who do not display the above characteristics.

The final area that was discussed in this section deals with cultural influences. Research with TA men has shown that his job is the primary focus of his life. These men describe themselves as eager and challenged and claim to thrive on the pace they set for themselves. In cultural terms (particularly American culture), these men may be seen as images of the self-made success story, living to the fullest the value ideal that you can become anything you

want if you are willing to work hard enough for it.

Unfortunately, information from other cultures is scarce. But, Japanese-American men provide an ideal experimental opportunity. These men come from a modern industrialized culture with an educational achievement system similiar to ours. However, their cultural orientation differs in several ways. For, example, the highest value is placed on the well- being of the group rather than the well-being of the individual. Selfish individual achievement efforts are disruptive to the primary goal of group achievement.

In addition, rural populations are less coronary- prone than are urban (city) populations. This finding seems to be related to the hightened pace of "city life" and to the social facilitation phenomenon.

While the above research shows evidence for TABP in other cultures and an increase in CHD with social change, work in this area is still in the early stages. At present, more research is needed on cross-cultural and subcultural variation in the expression and prevalence of the CPBP.

1.J SEX DIFFERENCES AND THE CPBP

1.J.1 I. Cognitive And Behavioral Factors

As stated earlier, TA research has focused primarily on middle-aged, middle-class, employed American males. Since the behavior pattern seems ubiquitous in this population, and since this population currently has a higher risk than any other of developing CHD, it is not clear to what extent the TABP may simply be an artifact of the population studied. One way to find definitive answers to the issue of what TA is, is to explore its prevalence, observable behavioral manifestations, and amount of associated CHD risk in other cultures and subcultures, in other age groups, and in women.

It is beyond the scope of this review to consider possible differences in TA in each of these different populations. However, since the target population of the proposed study is women, it would be informative to focus on possible sex differences in the TABP.

Research on TA behavior in women is beginning to be undertaken by a number of different investigators. However, in none of the work to date has a model been proposed to account for possible differences between TA men and women. In addition, with women entering the job market at levels traditionally reserved for men, there is a growing fear of

increased rates of CHD in females due to chronic stress. Considering that CHD often takes decades to develop before symptoms appear, it would be important to identify risk factors for women as soon as possible. In addition, one can hardly avoid noticing that many women in our culture show evidence of time urgency and tension.

A number of problems arise in attempting to answer questions about sex differences and TA behavior. For one thing, few investigators have examined the TABP in until very recently. Since the operational measures of TA, such as the JAS and the SI were developed for male populations, their validity with women has not yet been established. The only measure of TA that has demonstrated validity for women is the Framingham TA scale (Haynes et al., 1978).

The SI and the JAS use observable manifestations of the TABP (e.g., accelerated pace of ordinary activities) or the self-report of these manifestations as indicators of the presence of the behavior pattern. These measures do not examine in a direct fashion the individual's personal belief system which, in the proposed model, constitutes the core of TA. To the extent that the observable manifestations of the pattern are the same for men and women, the operational measures should be valid for both populations. However, considering the substantial differences in sex role training in our society, as well as possible genetic differences, it

cannot be assumed that women manifest TA beliefs and fears in the same way men do.

Figure 1 illustrates this point. The proposed TA beliefs and fears function as antecedents of TA behaviors. That is, they set the stage for observable manifestations of the pattern. Cognitive social learning theory suggests that the same antecedents can lead to different sets of behaviors depending upon how those antecedents are interpreted and upon environmental influences. Females may interpret environmental events somewhat differently from the way males do, in part as a function of sex role training.

Observed behavior also depends upon the consequences it elicits. If the consequences are positive, the behavior is more likely to occur again. On the other hand, if the consequences are negative, the behavior is less likely to occur again. The same behavior often elicits different consequences for women than for men in our society. Therefore, certain TA behaviors may be exhibited primarily by only one sex or the other. For example, aggressive behaviors are encouraged (i.e., modeled and rewarded) for American males but are often frowned upon for American females. So, to the degree that current measures of TA rely on signs of aggressiveness to identify the presence of the pattern, those measures would be somewhat inadequate for identifying the CPBP in women. On the other hand, certain

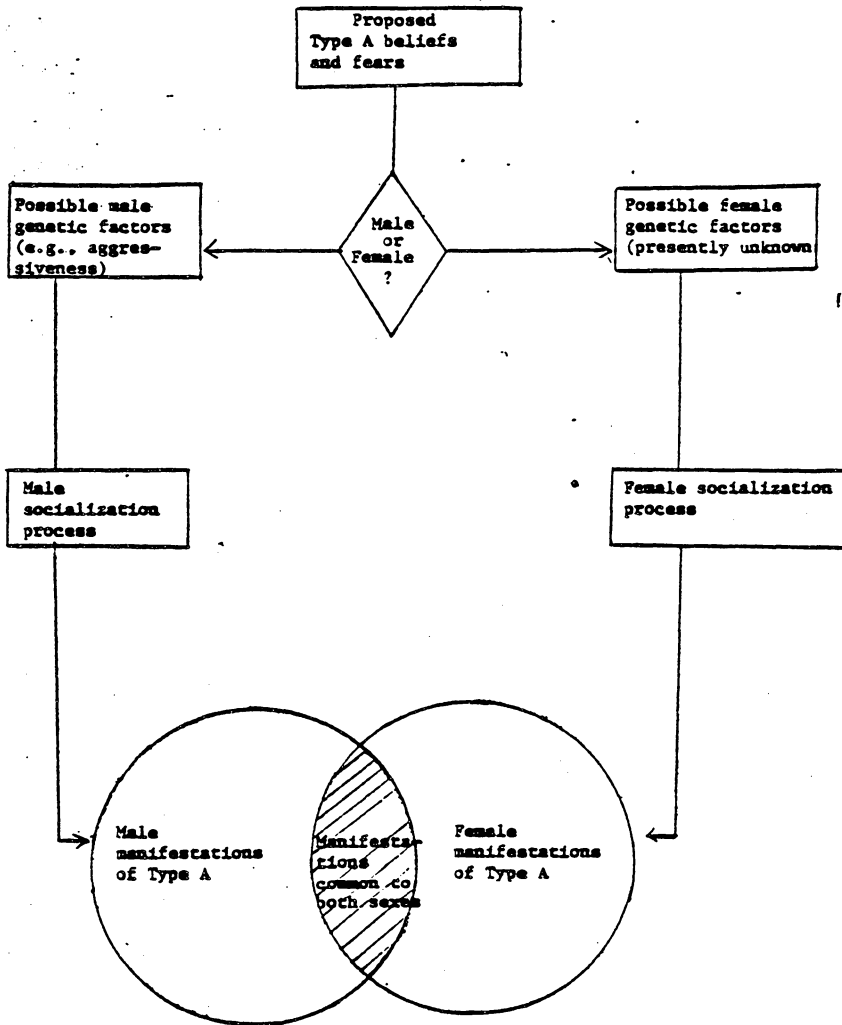


Figure 1. Factors that may account for similarities and differences in observable Type A behaviors in male and females.

TA characteristics, such as speed and impatience, may be commonly observed in both sexes.

Finding sex differences in the pattern is further complicated by the fact that it is not yet known what features of the TABP are more important than others in predicting CHD. For example, in the epidemiological study on CHD carried out in Framingham (Haynes et al., 1978), women of all ages scored significantly higher than men on certain socioemotional dimensions, such as emotional lability, unexpressed anger, and anxiety (Haynes et al., 1978). Women also reported much higher tension than men. Yet, men were more likely than women to score high on the overall TA scale and to report being ambitious. Men also consistently exhibit higher levels of competition and aggression than women (Maccoby & Jacklin, 1974). Thus, if ambitiousness, competitiveness, and aggressiveness, for example, are the components of the pattern carrying substantial CHD risk, then current measures of the behavior pattern could be considered more adequate across populations. We could conclude that, at least in Western cultures, men exhibit more TA behavior than women.

Until empirical study further clarifies the relative role of these and other TA characteristics that render the behavior pattern a risk factor for CHD, statements about sex differences must remain tentative. In the meantime, what is

known about the CPBP in women remains largely a function of sex similarities, rather than sex differences, in the observable behavioral characteristics associated with the pattern.

Despite the paucity of knowledge about the TA phenomenon in women, it seems important to examine what is known to date and to suggest possible sex differences from within the context of the proposed cognitive social learning model of TA behavior. The following questions, related to sex differences in TA deserve comment: (1) What is the difference in the rate of CHD in men vs women? (2) What association has been found between TA behavior and CHD in women? (3) Do women exhibit the same degree of the TABP that men do? and (4) What might account for possible differences in the way the behavior pattern is exhibited in men and women?

1.J.1.1 (1) Sex Difference In CHD Mortality Rates -

in the U.S.

The rates of male to female mortality in the U.S. from artereosclerotic disease, including CHD, is approximately 2 to 1 (U.S. Department of Health, Education, and Welfare, 1979).

1.J.1.2 (2) Association Between TABP And CHD In Women -

compared to men

What contribution does the TABP make to higher rates of CHD in men? Table 1.3 shows the prevalence of clinical CHD in samples of men and women classified as either TA or TB. These data suggest that once the behavior pattern is taken into account, the relative contribution of sex to CHD risk is substantially reduced, except in the younger TAs. Importantly, in both age groups men and women classified as TB show similiarly low rates of CHD. Further, the prevalence of the disease in both TA men and TA women is significantly greater than for their TB counterparts.

In all, six studies have examined the relationship between the TABP and CHD in women. Rosenman and Friedman (1961) found the prevalence of CHD to be four times higher among extreme TA women than among extreme TB women. Kenigsberg et al., (1974) used the JAS to identify TAs, and reported that women with CHD scored significantly higher on the TA scale than women without CHD. The Bengtsson team (1973) found that women who had been hospitalized for MI scored significantly higher on aggression (as measured by the Cesarec-Marke Person Schedule) than a healthy control group. The Framingham Heart Study of Haynes et al., (1978) reported that women exhibiting the TABP were more prone than TB women to have CHD, especially angina. Among employed

Table 1.3 Relation of Clinical Coronary Heart Disease to Age, Sex, and Behavior pattern^a

	Percent with clinical coronary heart disease (sample size)	
	Type A behavior pattern	Type B behavior pattern
Premenopausal females	10% (82)	3% (110)
Men less than 50 yrs.	24% (61)	3% (67)
Postmenopausal females	37% (43)	9% (22)
Men more than 50 yrs.	41% (22)	6% (17)

^aTable taken from I. Waldron, (1976), based on data from R.H. Rosenman and M. Friedman, (1961) and from M. Friedman and R.H. Rosenman, (1959).

women, TAs had four times the amount of CHD as TBs. TA housewives also had higher rates of heart disease than TBs, especially in the 45-54 year-old age group. In the first prospective study of the TABP in women, Haynes, Feinleib, and Kannel (1980) reported that the relative risk of developing CHD over the 8-year period studied was 2.5 among women aged 45-54 and 1.9 among women aged 55-64 if they scored above rather than below the median on the Framingham TA Scale. Furthermore, TA women were three times as likely to develop angina as TB women. Lastly, Blumenthal, Williams, Kong, Schanberg, and Thompson (1978) found that the severity of atherosclerosis as measured by angiography was significantly greater in women classified as TA (as measured by the SI) than in women classified as TB.

1.J.1.3 (3) Degree Of TA Behavior In Women -

compared to men

As stated earlier, few TA studies have collected systematic data on women. TA as traditionally conceived appears to be generally more prevalent in men than women. In the Framingham study, for ages 45-77, employed women had significantly higher TA scores than housewives. Further, regardless of age, more employed women scored in the TA range and more housewives scored in the TB range. Another study of women corroborating the Framingham data found that

full-time employed women had higher TA scores than women not employed outside the home (Waldron, 1978).

In the Framingham study, average TA scores for employed women were almost identical to TA scores in men. Further evidence for a correlation between employment and TA scores comes from research on need achievement. Excessive achievement striving is considered to be a major feature of the behavior pattern. In two studies examining the need for achievement in women, college-educated women scored higher than nonemployed women. Indeed, women who were both more educated and employed full-time had higher scores than women who met only one or the other of these criteria (Baruch, 1967; Kriger, 1972).

With the recent emphasis on equal employment opportunities for women, more women are entering fields and seeking positions heretofore reserved mainly for men. This trend has brought controversy about women assuming traditional male roles: will women experience more stress-related diseases such as CHD? Suggestive evidence for a potential link between improved job opportunities and stress-related illness was found by Waldron (1978). Women whose most recent occupation was "higher status" (i.e., administrative personnel, proprietor of a small business, or semiprofessional) did have higher TA scores than women in "lower status" occupations. In the Chicago Heart Study,

when differences in occupational level and education were controlled statistically, women's TA scores did not differ significantly from those of men (Shekelle et al., 1976).

The psychophysiological studies involving women suggest that women respond to demanding situations with less arousal than men. For instance, Manuck et al., (1978) reported that whereas TA males showed greater SBP elevations than TB males in response to a difficult cognitive task, no differences in SBP reactivity were exhibited in TA compared to TB females under these same conditions. MacDougall et al., (1981) reported that TA compared to TB females did show greater increases in SBP during a moderately challenging interpersonal exchange (i.e., the SI). Unlike their male counterparts, however, TA and TB females did not differ significantly in physiological response to either a physical challenge (the cold pressor test) or to a high incentive time task. Lundberg and Forsman (1979) found that although the two sexes had similar physiological responses under conditions of mental understimulation, males excreted higher levels of EP than females when overstimulated by a mental task. Interestingly, under one particular type of challenging situation, namely, competition, females have demonstrated more physiological arousal than males. Specifically, Van Egeren (1979a) demonstrated that females had larger HR responses than males when playing a game under a competitive strategy, although they showed smaller HR

responses than males under a cooperative strategy.

1.J.1.4 (4) Sex Differences In Type A: -

Cognitive and behavioral factors

As mentioned earlier, cognitive factors, and in particular, personal beliefs and fears, are most likely at the core of the TABP. Even though the core of the TABP may be the same for both sexes, the specific, more readily observable ways in which men and women manifest these beliefs and fears may well differ. Therefore, the behavior pattern may take on a somewhat different appearance in men and women.

It is beyond the scope of this review to document all the sex typing that takes place in our society that might relate to sex differences in the TABP. Instead, I will consider on a selective and preliminary basis possible sex differences in some of the major components of the TABP.

According to cognitive social learning theory human functioning can be accounted for by the reciprocal interaction between personal (i.e., behavioral, cognitive, and physiological) and environmental factors (see Figure 2). To analyze possible sex differences in the TABP, each of these factors needs to be considered. Personal factors will be examined first, with consideration for environmental

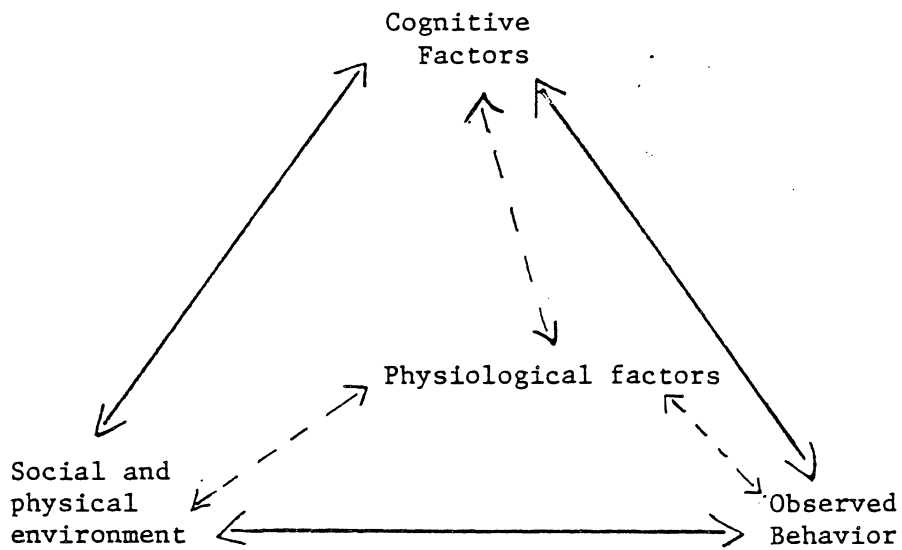


Figure 2. Expanded cognitive social learning reciprocal interaction model of human functioning. (Adapted from C.E. Thoresen, 1979.)

factors to follow.

1.J.1.5 1. Cognitive Factors -

Research on sex differences has focused on a number of cognitive factors that are intimately tied to CPBP. Included are (a) self-worth (self-esteem), (b) fear, and (c) reliance on social approval.

1.J.1.5.1 (a) Self-esteem -

The cognitive factor most closely connected with self-esteem is the belief that one has to prove his worth by a never-ending series of accomplishments without which he feels inadequate. Research has failed to identify sex differences in self-esteem level. Rather, the two sexes have been found to differ in the areas of functioning in which they feel self-confident: girls feeling more socially competent and boys feeling more powerful and dominant and more physically strong (Maccoby & Jacklin, 1974). In other words, males and females develop certain efficacy expectations based largely upon their unique social learning histories, including experiences specific to their gender. Physiological factors influence these efficacy expectations to some degree. For example, males may be more preoccupied with questions of dominance due to higher levels of androgens which are thought to enhance the salience of

the dominance dimension (Tiger, 1969),

Males and females also differ in their willingness to admit to a lack of confidence, or esteem. For example, college-aged men have been found to "defend their egos" by turning against an outside frustrating object, whereas college-aged women tend to engage in more self-blame when feeling under attack (Bogo, Winget, & Gleser, 1970). This difference could have important implications for the way TA is manifested. That is, males who feel threatened may be more inclined to exhibit interpersonal hostility, whereas females who feel threatened may exhibit more self-directed distress.

Experience with post-coronary women indicates that they exhibit more overt depression than their male counterparts though TA men sometimes appear depressed too. This observable gender-related difference in depression may reflect both (a) men's tendency to turn their frustration outward rather than inward, and (b) fewer negative consequences perceived by women than men for acknowledging and expressing their feelings of self-doubts and depression. Thus, differences in observable behavior may be largely a function of well-learned, sex-specific, cognitive factors.

1.J.1.5.2 (b) Fear -

Research has shown that boys are more reluctant than girls to admit to fears or anxieties (Lekarczyk & Hill, 1969); boys had higher scores than girls on the Lie and Defense scales of the MMPI with respect to fear. Especially for men, the socialized antidote for fear may be the acquisition and performance of action-oriented behaviors (i.e., TA behaviors) that divert their attention from their fears. Unfortunately, diversion does not necessarily reduce or eliminate fear or its physiological concomitants. Furthermore, if the action-oriented behaviors themselves chronically over-activate the sympathetic nervous system (as in the case with TA behavior), then the diversion could increase one's risk of CHD. So, what has traditionally been called TA may actually be an ineffectual set of coping skills for handling both fears and the belief that one continually has to prove his worth. Interpersonal hostility also appears to disguise feeling threatened, fearful, or hurt. Indeed, hostile reactions can often be taken as a sign that a man is feeling fearful, helpless, or out of control (Price, 1982).

1.J.1.5.3 (c) Reliance On Social Approval -

It is a rather widely held belief that females are reliant on social approval and behave in ways to elicit it. In their review of research on social approval, Maccoby and Jacklin (1974) concluded: "Girls are not more motivated to achieve for social rewards. The two sexes are equally responsive to social reinforcement, and neither sex consistently learns better for this form of reward than for other forms (p. 349)." This finding is also supported by Price (1982) who found that both sexes strive equally hard for social approval and express anger and/or hurt at even the slightest indication of social disapproval.

1.J.1.6 2. Behavioral Factors -

Identifying sex differences in the traditionally studied components of TA would aid our understanding of possible observable differences in the behavior pattern. A brief analysis of possible differences between males and females with respect to (a) performance standards, (b) aggressiveness, and (c) competitiveness will be presented. These factors were chosen for examination for two reasons: each one is considered to be a basic part of the pattern, and substantial research on sex differences has been reported on these variables.

1.J.1.6.1 (a) Performance Standards And Self-evaluation -

Under neutral conditions, men and women do not differ in terms of the standards they feel must be met for personal evaluation (Maccoby & Jacklin, 1974). Research by Waldron (1976) revealed that when females were told their performance would be compared to outstanding achievers, they lowered their usual expectations regarding their own performance. They also performed more poorly than usual. However, males did not experience a similar decrement in their earlier expectations or in their performances. Yet, when females were asked what performance standards they would have to meet to feel good about themselves, they identified very high standards. Thus, in highly competitive situations, females set high standards for positive evaluation, but they expect to perform and do perform more poorly than in noncompetitive situations. This, along with the work of Van Egeren (1979a) who found that women show larger HR responses than men in competitive but not cooperative situations, have possible implications for an increased level of stress for women who assume traditional male roles in which competition is an integral part.

1.J.1.6.2 (b) Aggression -

In their review of over 7000 studies on sex differences, Maccoby and Jacklin (1974) found little evidence for genetic factors to account for vast difference in observable behavior in males and females. One of the few exceptions was aggression. These authors reviewed 66 studies on aggression. Males were consistently found to be more aggressive than females in diverse settings, using a wide variety of behavioral indices.

There are at least four sources of evidence for a biological sex difference in aggression (Maccoby & Jacklin, 1974). First, males are more aggressive than females in all societies studied. Boys are more aggressive both physically and verbally. Second, these differences are found as early as social play begins (at 2-2.5 years) before differential socialization regarding aggression is thought to have had a chance to occur. Third, aggression is related to levels of male hormones called androgens, especially testosterone. Finally, in subhuman primates, males are also more aggressive than their female counterparts.

The difference between the sexes on the dimension of aggression also appears to have a learned component. Boys may learn to be more aggressive in part through social modeling (Bandura, 1973). An important fact here is the finding that boys are disciplined more and receive more

physical punishment than girls (Siegelman, 1965). Furthermore, boys generally aggress more against other boys than against girls (Bandura, 1973). Thus, males may be more aggressive in part because they are more often the victims of aggression.

The foregoing discussion is not meant to imply that females are not at all aggressive. As is the case with other characteristics and behaviors in which sex differences exist, men and women have overlapping distributions on aggression. It may be that the women whose scores resemble those of men on the dimension of aggression are the women who are at higher risk of CHD by virtue of their TA behaviors.

1.J.1.6.3 (c) Competition -

The body of evidence accumulated through 1981 indicates that competitiveness is primarily learned. About half the studies comparing male and female levels of competition have found no sex differences at all (Maccoby & Jacklin, 1974). In the remaining studies, females were found to be more cooperative and males more competitive.

A major drawback in the literature on competition is the nature of the tasks (e.g., the Prisoner's Dilemma game) on which competitiveness is typically evaluated. These tasks bear little resemblance to the kinds of activities TA

men and women regularly engage in. Studies are needed to compare men and women in more typical real-life competitive and cooperative situations.

1.J.2 II. Environmental Influences On Men

Boys in our society usually learn that their success as men will be largely a function of succeeding in their work. Evidence that the workplace is the environment of key importance for coronary-prone men comes from three related lines of research. Friedman et al., (1960) found that TA men work an average of 54 or more hours a week, whereas TB men work only an average of 42 hours a week. A significant correlation between level of TA behavior and number of hours worked per week has been more recently demonstrated by Howard, Cunningham, and Rechnitzer (1977). These investigators examined 236 managers from 12 different companies and found that TAs worked more hours per week and traveled more days per year.

The workplace is the main environment in which TA men attempt to prove themselves by their tangible accomplishments. Many of the factors described in this section may also apply with employed women but perhaps to a lesser extent, since men have been more thoroughly socialized than women to treat work as being all-important.

1.J.2.1 1. The Workplace: A Key Environmental - factor influencing TA behavior

The purpose of this section is to present a model of the relationship between the TABP and the work environment, based upon interpretation of the relevant research findings to date (see Figure 3). Accordingly, this section has been structured to include the six major categories presented in Fig. 3: (a) susceptible TA individuals ; (b) work environment; (c) control conflict; (d) maladaptive coping behavior; (e) symptoms; and (f) changing TA behavior.

1.J.2.1.1 (a) Susceptible TA Individuals -

Studies investigating individual differences in susceptibility to TABPs have isolated certain determining factors such as age, socioeconomic status (SES), education, socialization, urban living, and to a certain degree, sex differences (Fig. 3).

Age.---There are strong indications that the TABP is associated with age, in that TA characteristics such as time urgency and ambition decrease with age. Waldron, Zyzanski, Shekelle, Jenkins, and Tannebaum (1977), for example, investigated both males and females in a number of companies and found that the older half of the sample had lower mean TA scores than the younger group. In a similar study,

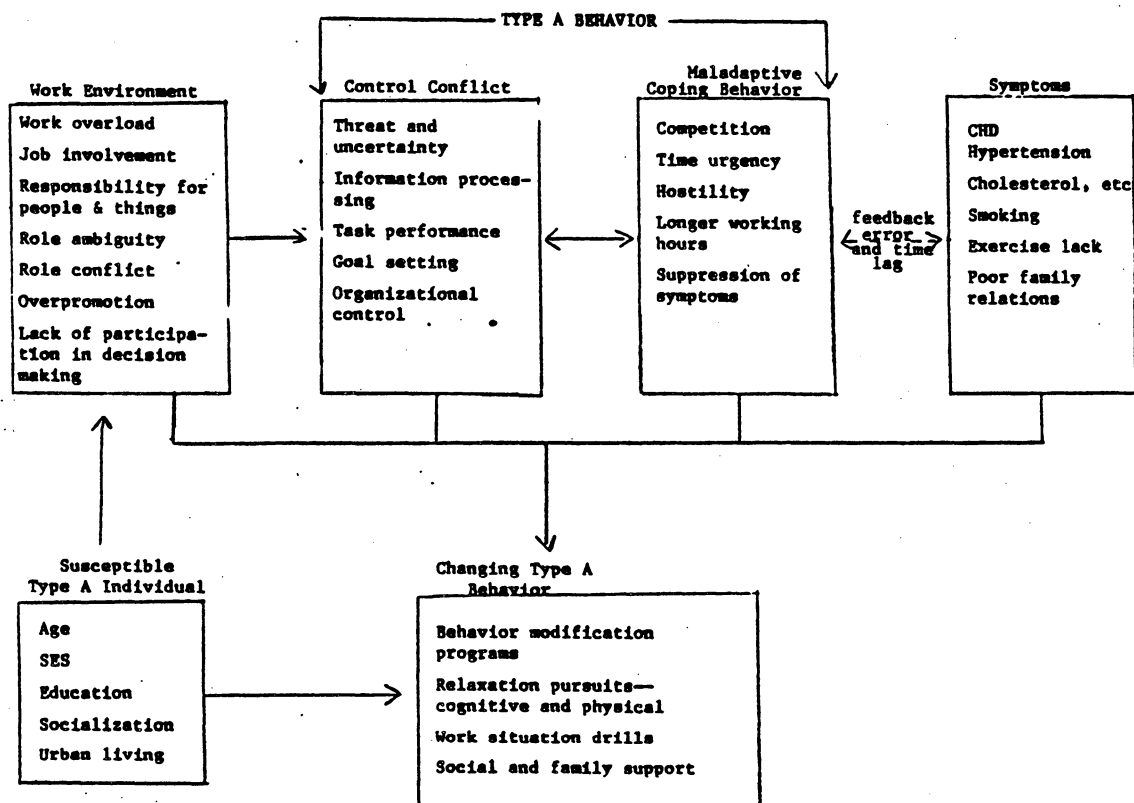


Figure 3. A model to illustrate the relationship between TA behavior and the work environment. From Davidson and Cooper, (1980).

Howard et al., (1977) isolated the age group 36-55 years as being the high-risk period in terms of the TABP, and noted that this is often the time period when numerous aspects of an individual's career take on a sense of urgency.

Socioeconomic and Occupational Status.---The WCGS was the first major research project to associate higher TA scores with higher occupational status (i.e., professional/technical and managerial), while finding that blue-collar unskilled laborers were likely to be TBs in comparison. There are several explanations for this. It may be that the answer lies in the TA characteristic of high work-oriented devotion and emphasis on occupational self-esteem, which appear to be more prevalent in white-collar and professional workers (Burke, Weir, & DuWors, 1979; Townsend, 1979). Indeed, a recent study of white-collar administrators revealed that higher levels of TA behavior were related to high occupational self-esteem (Burke et al., 1979). The desire to achieve higher self-esteem is further evidenced through observational learning and peer pressure.

A primary way in which people learn is by observing others. Observational learning is enhanced by a number of different variables. including the status of the model (Bandura, 1971). Those who might be expected to have higher status in the eyes of an ambitious TA person are his manager, partner, or co-worker--someone who has already

achieved the social recognition and demonstrates the self-pride the TA individual seeks. Since an estimated majority of the urban population in the U.S. is thought to be TA (Rosenman & Friedman, 1977), there is a high probability that persons being emulated will exhibit the TABP.

Persons classified as TA "almost invariably attribute to this behavior pattern the credit for any socioeconomic or professional success they presently possess" (Friedman, 1979. p. 552). When a TA man observes extremely hard-driving, competitive, and aggressive behavior in his superiors, he may attribute their relative success to these behaviors. Furthermore, he may feel that he has to exhibit an ever greater degree of these behaviors in order to be seen as successful in their eyes. So in addition to modeling, or imitating, the behavior of these persons of higher status, an individual may feel driven to compete with them to prove he is worthy.

Another powerful influence on self-worth is peer pressure. Indeed, peer pressure is perhaps the most salient social influence for TA men. Failure to conform may result in reducing a person's chances for success. Peer pressure and the expectations about what constitutes appropriate work behavior can make it very difficult for persons to act in accordance with their own personal values. In fact, to

resist these social influences in such an important realm of a person's life requires a highly developed awareness of and confidence in one's own values--the very thing TA persons are generally thought to lack (Friedman & Rosenman, 1959). Indeed, assuming as one's own the prevailing social values of the workplace may be seen by most TAs as the most important requirement of success.

Conversely, Townsend (1979) showed that this type of job involvement is not inherent in blue-collar workers, and that, for the majority the needs of their family and home have far more emotional significance than those from their job. According to Townsend (1979), manual workers seek the rewards of work in order to enrich life outside work, rather than taking intrinsic satisfaction in the job and the conditions in which it is performed. This is in direct opposition to TA individuals. In fact, TA behavior appears to take a significant toll on family relationships. Indeed, a recent study showed that spouses whose husbands' degree of TA behavior was high experienced less marital satisfaction, as well as more feelings of (a) depression and worthlessness, (b) anxiety and tension, and (c) guilt and isolation, than spouses of husbands whose degree of TA behavior was low (Burke et al., 1979). Wives of TA husbands also reported fewer positive and more negative marital interactions, and lower overall marital satisfaction. Further, they reported that their husbands' jobs had a

greater negative impact on personal, home, and family life than did wives of TA men. Lacking intimacy with their spouses, TA males often seem to view their wives more as subordinates or, at best, as junior business partners than as persons who could benefit from loving support and kindness (Fasteau, 1975). Alternatively, the wife's role is often seen as that of a "stress absorber," easing much of the immediate frustration of her husband's stressful day.

TA parents see their children as achievements. Like all other achievements, the children are expected to be perfect. When they are not, they become objects of their parents' anger and impatience. Further, men derive little if any recognition from spending time with their children, especially when their children are small. In fact, during the years when their children are young, men may be at the point in their careers when they feel they need to prove themselves perhaps more than at any other time.

In addition, TA men tend to have difficulty expressing feelings, especially positive emotions. This lack may cause resentment. Fathers are often seen by their children as a combination of judge and jury who comes home after a hard days work with no patience to spare. Thus, the father's TABP may in part explain why adolescent children are commonly referred to by TA men as a major source of chronic stress. Also, Feinberg (1980) has suggested that children

of TAs experience excessively high standards, an inability to please or be good enough, and stinging criticism. They were also least satisfied with the help they received from their fathers. Thus, it appears that TA behaviors which may be acceptable in the workplace become the source of resentment and poor interpersonal relationships between fathers and their children in the home.

It has also been hypothesized that SES differences in TA behavior develop from socialization and child-rearing class differences. Waldron et al., (1977) believe that middle-class parents present themselves as TA models to their children and encourage a high need for achievement, especially in sons. Furthermore, Butensky et al., (1976) reported that the mean TA scores were the most extreme between middle-class urban and working-class rural families. This also substantiates Friedman and Rosenman's (1974) contention that urban living enhances TABPs far more than do rural environments.

Sex Differences.---The final variable to be discussed relates to sex differences and susceptibility to TABPs. Previous research has shown that TA behavior is far more prevalent in males than in females. With approximately 50% of the women in the work force in the U. S. and with CHD being twice as prevalent in men as in women, one could hypothesize that women in the work force are more likely to

be TA individuals and hence to be more susceptible to CHD (Chesney & Rosenman, 1980). Certainly, it seems that there is a higher incidence of TABP in women in the work force than among housewives, especially among women who are not being forced to work due to financial pressures (Chesney & Rosenman, 1980).

As with male TA individuals in the work force, high occupational status also appears to relate to TA behavior, especially in working women aged 40-59 years (Waldron, 1978). Also, Waldron et al., (1977) in their study of employed men and women revealed that, unlike men, working women show maximum TA scores between the ages of 30-50 years, when "speed and impatience" were exaggerated. They reasoned that this "age peak" was due to the fact that more TB females tend to leave their jobs upon having children before the age of 30, and hence, it is the A types who tend to persevere with their careers. With 90% of women having at least one child, between the 30-35 year age bracket, and working women having one-third less free time than housewives, it is perhaps not surprising that time pressures, overload and impatience become prevalent for working women in this age group (Waldron et al., 1977).

In conclusion, therefore, there are strong inferences from the research literature that women in the work force are more likely to be TA individuals and have a higher risk

of developing CHD than their non-working counterparts.

1.J.2.1.2 (b) The Work Environment -

Much of the research investigating TABP in the work setting suggests that the stressors within the work environment itself enhance the TABP. Rosenman (1977) strongly proposes that when many individuals enter certain occupations (e.g., switchboard operators, managers, etc.) they often do not possess TABPs. However, increased time pressures, demands for speed, and conscientiousness required by the job can make a relaxed TB into a TA.

Recent research investigating the effects of stressors on managers substantiates these assertions to some degree, and suggests that the conditions most responsible for facilitating TA behavior are those encountered in the work environment (Howard et al., 1977). Additional support for this proposal comes from Friedman et al., (1960) who found that their TA middle-aged managers had higher levels of catecholamines and were more physiologically aroused during hours at work than were TBs.

When examining the TABP in the work environment, Chesney and Rosenman's (1980) contention--that an important facet of this behavior is the strong preference to control the environment--is noteworthy. Consequently, stressors in the work situation which can be perceived as being sources

of most stress are those which may lead to decreased levels of perceived control. The work environment factors which have been isolated as fitting into this category include: job involvement, responsibility for people and things, role ambiguity, role conflict, overpromotion, lack of participation in decision making, poor relationships at work, and work overload (Fig. 3). In particular, a number of research studies have concentrated on investigating the relationship between TA behavior and work overload, relationships at work, job involvement, and job satisfaction (Chesney & Rosenman, 1980).

Work Overload.---Several studies have found strong correlations between work load and anxiety in TA individuals in varying occupations: e.g., university computer workers (Caplan & Jones, 1975); male accountants (Friedman et al., 1975); and managers (Chesney & Rosenman, 1980). In these settings a person may allay his fears of disapproval by setting and trying to meet extremely high performance standards, thereby maximizing his chances of positive self-evaluation. Such a person might typically overcommit himself to several projects or tasks, thus conveying to others his unquestionable commitment to his work. Job overload is associated with diminished job satisfaction, increased Ch levels, and greater risk of CHD (Sales, 1969). Constantly trying to meet extremely ambitious standards for positive evaluation and to avoid criticism that might affect

one's self-esteem almost always requires a chronic struggle against obstacles of time, other people operating from the same set of beliefs about their well-being, and one's own limited energy. Hence, the beliefs that generate and govern TA behavior appear to be compatible with and intensified by the dominant values of the workplace. In this way, cognitive and environmental influences interact reciprocally.

One of the implicit expectations in most work organizations is that employees will actively and persistently pursue advancement. The pursuit usually entails assuming more and more responsibility, which in turn, often requires engaging in an ever-increasing number of activities. Saying "no" to opportunities that could lead to advancement is dismissed as behavior contradictory to a person's presumed goals for success. Further, to set a limit on how much one is willing to take on is seen by most TAs as an open admission of personal limitations.

Further complicating the picture is the fact that succeeding in one's work usually depends not only on how much a person does, but also on how well he does. To ensure that he will be beyond reproach, a working person may feel that he must personally do or supervise the work. He may reason that he alone can set and meet sufficiently high standards to avoid the risk of being evaluated poorly.

Understandably, TA persons often report having difficulty delegating responsibility to others. Unfortunately, being unable to delegate work to others further increases the number of things to be done.

Job satisfaction.---Job dissatisfaction has been correlated with CHD (House, 1974; Sales & House, 1971) and, consequently, one would expect there to be similar correlations between TABPs and job dissatisfaction. However, this does not seem to be the case. Recent research by Howard et al., (1977), for example, revealed no significant differences between TA and TB managers with regard to job satisfaction, but found associations between TA managers and company growth rate.

Job involvement.---Job involvement enhanced by high need to achieve has also been associated with the TABP (Matthews & Saal, 1978). Furthermore, this seems to be compounded with the additional characteristics of competitiveness and high expectations of work performance by the TA employee (Chesney & Rosenman, 1980). Therefore, although research has isolated a number of high-risk work environment variables, Chesney and Rosenman (1980) emphasize that the self-selection of TA individuals into work settings conducive to the TABP is an issue which requires further research. In fact, McMichael (1978) maintains that TA individuals possess behavioral traits which actually

facilitate self-selection into occupations that involve increased exposure to stressors.

1.J.2.1.3 (c) Control Conflict -

The high-risk work environment factors which have just been discussed can cause susceptible individuals to form degrees of uncertainty in relation to goal setting, task performance, information processing and organizational control (Chesney & Rosenman, 1980). These investigators contend that in the TA person, unlike the TB, these conditions can often result in control conflict, i.e., conflict between preferred and actual available control (Fig. 3).

There have been a number of studies which have particularly concentrated on investigating the issue of the "need to control" by TA persons when placed under threat and challenge. This has been covered in sufficient detail in an earlier section of this paper (see Conceptualization of CPBP), and therefore, it is not necessary to detail it again. Rather, I would like briefly to discuss goal setting (i.e., setting deadlines).

In trying to meet all the perceived demands of the work environment, persons often behave in ways that exacerbate the TA-promoting features of that environment. For example, since physical time does not expand to accomodate an

excessive number of activities, a TA worker is faced with the task of trying to manage an unmanageable number of activities. In his attempt to do so, he may develop a number of habits reflecting time urgency. He may, for example, set unrealistic deadlines for himself in the hope that they will "force" him to get the needed work done. He establishes physical environmental constraints as a means of controlling his behavior. He may accelerate the pace at which he performs his work. He may become accustomed to polyphasing: doing two or more things at the same time. At length, he may develop the physical and emotional signs associated with time-driven behavior, such as chronic muscular tension and easily aroused anger and irritability. Clearly, the TABP is exacerbated by the combination of factors typically operating in the work environment.

If a person should fail to accomplish the challenging task of managing an excessive number of activities, his feelings of personal inadequacy may increase. He may reason that to conceal his presumed inadequacies from others, he should do even more to prove himself. On the other hand, succeeding in accomplishing everything he has undertaken may require a persistent struggle which, over time, may take a toll on his health, interpersonal relationships, and "personality"--that is, he may have to behave less like a person and more like a machine (Friedman & Rosenman, 1974).

1.J.2.1.4 (d) Maladaptive Coping Behaviors -

Two TA maladaptive coping behaviors which have been researched in most depth are time urgency and suppression of symptoms (Fig. 3) (Carver et al., 1976; Glass, 1977c; Weidner & Matthews, 1978).

Time urgency.---This component has been addressed previously; therefore, only a brief mention is necessary. TA individuals tend to have enhanced feelings of time urgency, and a number of laboratory studies have illustrated that TBs overestimate, and TAs underestimate the passage of time (see Glass, 1977c). In the work environment, time pressures are felt by TAs, mainly because of their underestimation of the time needed to complete tasks (Chesney & Rosenman, 1980). In addition, pressured TAs exhibit hostility on meeting fellow TA co-workers who do not seem to be so influenced by time (Chesney & Rosenman, 1980).

Suppression of Symptoms.---With the self-imposed time urgency experienced by TAs, and the subsequent increased speed of working, along with longer working hours, one would expect them to be subject to more fatigue than TBs. However, results obtained from research studies indicate that this is not the case, and TA individuals tend to suppress symptoms and fatigue (Carver et al., 1976; Weidner & Matthews, 1978).

TA subjects on a treadmill task, for example, reported lower subjective fatigue ratings than TBs and, according to Carver et al., (1976), this was a form of coping behavior in an attempt to attain control over the environment. Moreover, this suppression of symptoms and fatigue is greater in TAs when they believe the work or task is to continue, as opposed to being completed (Weidner & Matthews, 1978). In addition to fatigue, the suppression of hostility in TA persons has been shown to be a significant predictor of CHD among white-collar men and women (Haynes et al., 1978). Chesney and Rosenman (1980) report clinical observations of TAs imposing deadlines on themselves, increasing goals and denying physical pressure. Furthermore, TA individuals create a vicious circle. Once their work load has been lifted, they experience fatigue and distress, and there is a tendency for them to return to the struggles in the work environment in order to alleviate this discomfort (Chesney & Rosenman, 1980). Therefore, the prevalence of this suppression of symptoms in TAs not only exposes them to more prolonged physical and psychological pressures but may also make them less perceptive to early heart attack symptoms than are TBs (Carver et al., 1976).

1.J.2.1.5 (e) Symptoms -

The symptoms of the TABP which are facilitated by feedback error (i.e., denial of symptoms) and time lag include CHD, hypertension, increases in Ch and NE levels, lack of exercise, smoking, and poor family relations (Fig. 3) (Burke et al., 1979; Chesney & Rosenman, 1980; Friedman et al., 1975; Howard et al., 1976). Both physiological changes (hypertension, Ch, and NE) and CHD have been sufficiently covered earlier in this review.

Family life.---There have been several studies which have suggested that TA behavior by men in the work force can have a detrimental effect of family life in terms of family alienation, poor family health, decreased marital satisfaction and marital breakdown (Burke et al., 1979; Price, 1982; Steiner, 1972; Townsend 1979). In addition to what has been stated earlier in this section, Burke et al., (1979) found that wives of the TA administrators were more likely to be smokers and had greater feelings of social isolation than the spouses of TB individuals in their sample.

1.J.2.1.6 (f) Changing The TABP -

There have been fears expressed, particularly by TA individuals, that if there are large-scale attempts to change TAs into practicing TBs, this will affect not only the socioeconomic well-being of the individuals involved, but also the country's overall quality and quantity of work output (Rosenman, 1977). However, evidence obtained from TA behavior modification programs and clinical observations indicates that these fears are unfounded. Friedman and Rosenman (1974) assert that TB individuals are just as likely to be as ambitious and intelligent as their TA counterparts. Moreover, unlike that in TA individuals, the drive in the TBs is associated with security and confidence rather than irritation and annoyance.

TA behavior modification programs with both CHD patients and healthy subjects have reported significant declines in serum Ch levels and BP, lowered frequencies of subsequent coronary events, increased work productivity and improved family relationships (Chesney & Rosenman, 1980; Rahe, O'Neill, Hagan, & Arthur, 1975; Suinn, 1976). The overall aim of these training programs is to concentrate on all the facets of the TABP and to modify this behavior. Furthermore, Chesney and Rosenman (1980) emphasize the importance of training individuals, at the same time, to maximize their work performance.

In an attempt to change a TA's style of living, these modification programs involve such exercises as relaxation (both physical and cognitive) and behavioral speed changes. Also, specific behavioral drills are introduced to be practiced in the work environment, (e.g., having fewer meetings, scheduling telephone calls, allotting free time periods, etc.) (Friedman & Rosenman, 1974; Suinn, 1976). In addition, there is a need for both family and friends to encourage the participant and to be involved in the modification program (see Fig. 3).

The last major section of this review will focus on previous attempts to modify the TABP.

1.J.3 III. Environmental Influences On Women

While males are socialized to believe that their self-validation comes from succeeding in their chosen occupation, females are typically socialized to believe that their validation comes from being a perfect caretaker, although this contrast is diminishing. More specifically, women typically learn that approval of others is to be gained by following a series of prescribed steps. First, a woman is expected to become attached to a man (i.e., to marry). Once married, she is then expected to care successfully for his needs for the rest of his life. To maintain the approval of others, she is also expected to

bear and rear children successfully.

The socialized criteria of success for women have profound implications, since, in addition to caretaking responsibilities, an increasingly large percentage of women in the U.S. (about 50%) are also employed at least part-time outside the home (U.S. Department of Commerce, 1976). Women in less traditional roles, that is, women employed outside the home, are exposed to a somewhat different set of environmental factors that can promote TA. Indeed, many of the same environmental factors impinging on men at work also affect a large number of women. Yet, women have undergone a considerably different socialization than men, whether or not they are currently in similar roles. For instance, employed women report feeling they must succeed in proving themselves in both home and work arenas.

To understand better the possible sex differences in TA, we need to take a closer but separate look at the environmental influences on traditional women and women employed outside the home.

As previously stated, women have been socialized to believe that they can prove their personal worth through their role as caretakers: wives, mothers, and housekeepers. To be beyond reproach in the caretaking role, TA women usually feel that they must put everyone else's needs above their own. If she fails to meet her high standards, she may

conclude that she is not worthy of self-esteem, perhaps resulting in the renewal of her efforts to fulfill each to these roles more perfectly.

It bears mention that women in the caretaking role often ignore their own needs. Their excessively high standards for positive self-evaluation rarely extend to how well they care for themselves. Traditional women in the home, relentlessly pursuing perfection in their caretaking role and ignoring matters of personal well-being, appear to be similar to men (or women) in the workplace relentlessly pursuing the approval of others at any cost, including the deterioration of their health.

TA women, like TA men, report feeling driven to be the very best at whatever they undertake. This drive presents a unique problem for traditional women because the standards for excellence in the work they do are generally ambiguous or lacking. In the face of inadequate objective criteria of success in household tasks, many TA women seek perfection. Clinical experience with post-coronary TA women illustrates this phenomenon; women frequently report feeling compelled to persist in housecleaning chores or extravagant entertaining even when experiencing severe angina or extreme fatigue (Baruch, 1967).

Closely related to the problem of inadequate performance criteria is the kind of feedback traditional women get for the work they do. It differs considerably from the feedback employed men and women receive, which usually takes the form of special recognition or promotions. By contrast, traditional women do not get systematic feedback about how well they are doing. In fact, they frequently report little or no feedback from the one person who is in a unique position to observe their work, their husband. The problem is that men in our society are typically not taught to be appreciative of the work women do (Fasteau, 1975). Therefore, when a woman does a good job, her husband may provide little if any reaction. Nor does she receive a tangible promotion, raise, or award for her work.

Related to the problem of inadequate feedback is the issue of inadequate social support in general. Usually, traditional women typically have little regular contact with adults outside the home, especially when their children are young. Of importance here is the substantial body of evidence indicating the protective influence of social support in reducing stress and its degenerative effects (see Fig. 4) (e.g., Berkman & Syme, 1979; Byrne, 1978; Cobb, 1976). Data from the Framingham study may also speak to this issue: whereas TA compared to TB working women were twice as likely to develop CHD, TA compared to TB housewives

were three times as likely to develop the disease (Haynes et al., 1980). Research is needed to explore the possibility that insufficient social support for women in the home may account for the different levels of coronary risk associated with the TABP.

Clinical work with post-coronary TA women suggests that many women who have had heart attacks consider themselves victims of chronic neglect or criticism. Thus, while a wife often serves as a sounding board for her husband, absorbing some of the impact of his stress-filled day, it is unlikely that a traditional woman has the same opportunity. Persons who feel unable to confront their aggressors directly because of undue reliance on their approval generally feel victimized and resentful. Few persons are in more dependent roles relative to others than a traditional wife who is both emotionally and financially dependent on her husband. Thus, many coronary women report not having expressed their growing anger, but instead having allowed a seething resentment to build over the injustice by which they perceive themselves as having been victimized (Price, 1982).

Another important influence on women is their children. They impose demands such as the constant care required by young children. The demands do not end when the children enter school. Once children are of school age, there are often many requirements for mothers to participate in

activities that are meant to be enriching for their children. There may be no worse indictment for a traditional woman who is trying to prove herself worthy of high esteem than to be criticized by others as an inadequate mother. Should she decide to avoid disapproval by participating in school activities, she may be unable to avoid physical exhaustion and emotional drain.

In the area of childrearing, performance criteria are even more ambiguous than in housekeeping activities. Yet, childrearing is the main area in which women expect themselves to demonstrate excellence. Indeed, this area is often the major focus of traditional women's efforts to prove themselves. In the short-term, effective childrearing is often operationalized to mean producing children whose achievements (e.g., doing well in school) and other observable behavior (e.g., demonstrating good manners in the presence of adults) are beyond reproach (Glass, 1977c).

Poor relationships with adolescents can have a substantial impact on the TA behaviors of mothers, increasing chronic stress and hostility, and often producing a struggle for control. A TA woman may perceive adolescent turmoil as a challenge requiring her special caretaking behaviors. According to Price, (1982), TA women in clinical settings frequently report seeing the caretaker role to include minimizing interpersonal conflicts among family

members. Negative consequences to women's mental and physical health may result from chronic demands for them to placate opposing sides in conflict situations, being accused by both sides of habitually taking the opposite side in any difficult-to-resolve situation: in short, experiencing role conflict. The consequences commonly reported by TA women include chronic emotional arousal and eventual emotional exhaustion (Price, 1982).

It is not known to what extent poor relationships within the family setting lay the groundwork for or trigger heart attacks in women. Yet, considering that TA women, at least when assuming the traditional role, seem to make their positive self-esteem contingent upon being successful wives, mothers, homemakers, it is reasonable to assume there is some connection.

Having a heart attack conveys several messages. Not only does an infarction convey the message to a woman's family that she can no longer be ignored or neglected, it may also be a way of telling her family to treat her more gently than they have treated her in the past. When she is subjected to excessive demands, she, like her male counterpart in the work situation, often cannot say "no." Having a heart attack gives her a way of setting limits on the number of demands that can be made on her.

In some cases, having an infarction may be a way of telling her family, "Look what you've done to me now." Data on coronary patients show they often experience intense feelings of anger toward others, though they often conceal them as best as possible (Rosenman & Friedman, 1968). They may also demonstrate anger toward themselves in the form of self-blame and self-destructiveness. In fact, in one recent study, anger was a prominent feature in housewives who develop CHD (Haynes et al., 1980).

The above information documents the influences on TA housewives. But, perhaps even more significant are the environmental influences on women employed outside the home. A discussion of the factors influencing employed women is to follow.

Over the past 50 years, women in the U.S. have been entering the labor force at an increasing rate (U.S. Department of Commerce, 1976). Compared to less than a third in 1942, half of all American women are now employed outside the home. Further, of all married women in this country, only 20% were gainfully employed in 1927. Half of all married women were in the labor force 50 years later. Possibly of greater significance is the fact that almost half of all mothers in the U.S. (44%) are currently employed, compared to less than one out of seven in 1927 (13%). Thus, in addition to the potential sources of stress

inherent in the traditional female role, a substantial number of American women are now subject to stresses and strains of the workplace. The role these women fill as employed persons differs in many ways from their more traditional role in the home. In fact, the role of employed women resembles closely the traditional male role.

As mentioned above, it has been hypothesized that the proving ground for a man is his workplace, while for a traditional woman it is the home. She proves herself by being a good wife, mother, and homemaker. For employed women, both of these arenas of her life constitute proving grounds for her personal worth. It could be reasoned, therefore, that employed women might have higher TA scores than traditional women, since they may seek and rely upon the approval of others in two major arenas. Indeed, in recent studies, employed women did score higher than housewives on the TA scale of the JAS (Waldron, 1978) and on the Framingham TA scale (Haynes et al., 1978). Their scores resembled more closely the scores of men than of unemployed women. One reason for higher TA scores in employed women may be that the two settings in which they feel they must prove themselves impose different and often conflicting sets of demands and generally tend to require different sets of behaviors. Role conflict has been shown to produce high levels of chronic stress and tension (Levine & Scotch, 1970).

Perhaps another reason for higher TA scores in women employed outside the home is that these women have more to accomplish in the same amount of time, compared to both men and traditional women. For example, national survey data indicate that employed men have 17% more free time per week than employed women (Szalai, 1972). Married employed women also report less free time than single employed women. In fact, Zappert (1978) reported that employed women spend as much as 80-120 hours per week working. This figure includes her outside employment, housekeeping responsibilities, and caretaking tasks. Recall that for males the total number of hours worked correlates positively with both TA scores and CHD.

The finding that employed women have less free time than others was supported by another recent study showing that women who have families and are employed assume major responsibility in both major arenas of their lives (i.e., work and home), whereas men appear to take primary responsibility only in their work (Cartwright, 1978). Clearly, employed women are subjected to a rigorous schedule that could easily account for increased TA scores.

On the basis of data such as these, Waldron et al., (1977) hypothesized that employed women would have higher scores on time urgency than their male counterparts, and that married employed women would have higher scores than

single employed women on this dimension. The authors found several interesting results. For their sample of employed white women, both TA and Speed/ Impatience scores achieve their peak mean values at ages 30-35. This positive relationship between age and the TA and Speed/Impatience scores for young adult employed women is significantly different from the relatively constant age trends for young adult employed men. They considered two hypotheses to explain this.

First, because TA women tend to be more hard-driving, competitive, energetic and hurried, they probably are more likely than other women to seek paid employment. In their early twenties more than half the women in the U.S. have no children, so many of them are likely to work even if they are not TA. In contrast, at ages 30-35, over 90% of women have at least one child and fewer women have paid jobs. Therefore, at these ages there may be a greater tendency for women who are not TA to stay at home, and the TABP would therefore be more predominant among those women who are still employed at ages 30-35.

A second reason why TA scores may be higher for employed women in their mid-thirties than for those in their early twenties may be that the older group has greater family responsibilities and therefore experiences greater time pressures. These time pressures would be expected to

increase the hurried, impatient behaviors reflective of the TABP.

It is important to now consider the specific environmental factors that influence TA behavior in employed women. Much has been written about the sources of stress for men in an upwardly mobile society, such as the U.S. By contrast, very little has been said about the stresses and strains that women experience on the job. Yet, the jobs that women have traditionally held, and continue to hold involve a number of sources of potential stress. First, jobs traditionally held by women are generally tedious, understimulating, and repetitive (Terkel, 1974). Such characteristics have been found repeatedly to generate as much or more stress-related illness than executive and high-level management positions which carry higher prestige (Frankenhauser & Gardell, 1976).

Second, women often lack authority and autonomy in their jobs, yet they have accountability (Zappert, 1978). Often they receive little recognition for enormous contributions. They are frequently the behind-the-scenes persons.

Third, women at any given occupational level earn 57% of the salary made by men (U.S. Department of Commerce, 1976). On the average they receive 43% less than men for the same work. Thus, these women, especially if they are

divorced or widowed and have children, may be under severe financial strain. They may have fewer hours in which to accomplish more, and they may have inadequate money to do so with ease.

Despite the stresses associated with relatively low-status positions, the hard-driving and competitive action thought to be required of persons in higher-status jobs may account for the fact that in at least one study, women whose most recent occupation was higher-status had higher TA scores than women with lower-status occupations (Waldron, 1978). This finding may also be due in part to the unique stressors for women who hold professional jobs or other positions traditionally reserved for men. For example, a woman who is ambitious and seeks professional success often has very few female models or mentors. Further, women are not part of the "old boy" network; thus, they are disadvantaged with respect to advancement even when they are equally skilled.

Davidson, Cooper and Chamberlain (1980) support this finding and expand on it. These investigators state that the few women who enjoy high-status positions in organizations are often subjected to male-dominated policy-making and experience additional stresses not undergone by their male counterparts of the same organizational status (e.g., feelings of isolation, conflict

demands between career and marriage/family, and coping with prejudice and discrimination). Therefore, with the additional pressures associated with being a minority group in high-status occupations, it is proposed that females in managerial and administrative positions are more likely to be TA individuals. This supports previous findings of Waldron et al., (1977), which found that higher-status positions in working women equated with higher TA scores.

Moreover, women who hold traditional male jobs are in the spotlight and often report perceiving themselves that way. Women often report that they do not represent just themselves alone but all women. A woman usually knows that if she does not do a good job it will reflect on and have serious consequences for other women who want to hold that same or similiar position in the future. These stressors for women in relatively high-status jobs could be expected to be reflected in higher TA scores.

Women holding traditional male jobs may have yet another stress unique to them: their occupational status relative to their husband's. The TA scores of women who have a higher occupational status than their husbands are higher than for women in any other category (Waldron, 1978). The only explanation for this finding is that in our society, married women are permitted to be successful, but not more successful than their husbands. This area

certainly requires further exploration.

Finally, there is no evidence to indicate that environmental factors in the workplace that influence TA behavior in men do not have a similar impact on employed women. So, work-related factors described earlier in this section such as the discussion of Figure 3 and additional factors such as observing TA behavior as the norm, peer pressure, and other pressures for men in the workplace can be considered sources of TA behavior in employed women as well.

A commonly expressed concern is that the movement toward equal employment opportunities for women will result in an increase in stress-related illnesses in women. In fact, research by Waldron (1978) supported this concern. She showed that among women who were not taking antihypertensive medication, high BP was more common for women who were employed full-time. Recent support for the concern of increasing stress-related illnesses in women comes from Pepitone-Arreola-Rockwell, Sommer, Sassenrath, Rozee-Koker, and Stringer-Moore (1981). These investigators showed that symptoms such as headache, muscle pain, allergies, colitis, high BP, respiratory problems, heart problems, and ulcers were related to the degree of perceived stress.

Stout and Bloom (1982) provide additional support for the concern of increasing illness in TA women. These investigators showed that female TAs reported significantly more frequent upper respiratory infections (URI) than did female TBs. These results were explained in terms of elevated catecholamine activity levels which interfere with the body's immune response, thus increasing its susceptibility to acute infectious diseases such as URIs. I would like to propose an additional explanation for the relationship between the TA personality and increased URIs. When under stress the body secretes high levels of cortisol. As the level of cortisol in the blood increases the level of ascorbic acid (vitamin C) in the blood decreases at a proportional rate (Colmano, 1983). Since vitamin C is known to play a significant role in immunity to URIs, it is proposed that this decrease in vitamin C in a stressed population leaves them more susceptible to URIs. This relationship will be examined in this proposed study.

1.J.4 Summary

In over 7000 studies on sex differences, there is very little evidence for genetic factors to account for the vast differences in observable behavior. The one exception was aggression. Males were found to be consistently more aggressive in a variety of settings and cultures. This is believed to be related to androgen levels. In addition,

aggression also has a learned component.

Sex differences in TABP can be examined via cognitive factors (both personal and environmental factors). There are several personal factors where men and women differ. These factors include: areas in which men and women feel confident (e.g., social competencies vs dominance and power); willingness to admit a lack of confidence; performance and self-evaluation (especially under competitive situations). Also important are certain environmental factors such as the workplace. This is the proving ground for TAs and they tend to work more hours per week and travel more days per year. In addition, the people TAs tend to emulate are also TA and therefore, the behavior pattern is reinforced. They become caught up in the belief that to accomplish more they must work harder. For this reason their family life is usually poor. Work overload is a factor well-known to TAs. TAs have a hard time delegating responsibility and therefore find themselves assuming more and more responsibility. Trying to live up to these standards leads the TA to suppress fatigue, to polyphase, to accelerate their pace of performance.

Even though the above factors also influence females, a separate look at the environmental influences on both traditional women and women employed outside the home is necessary. Traditional females have been socialized to

believe they prove their personal worth through their roles as caretakers. She puts everyone else's needs above her own and if she fails to meet their standards she will try harder to gain their approval. A factor that complicates this is the ambiguous criteria from which they receive feedback. Traditional women receive no special recognition or promotions and in fact, report little or no feedback unless something goes wrong. This further sets the stage for the same over-achieving behavior reported above.

For employed women who are married there are two proving grounds: home and the workplace. These females often report that these two settings impose different and often conflicting sets of demands. This, along with the fact that these women have more to accomplish in the same amount of time as traditional women causes their TA scores to be higher than those for traditional women. These women report less free time and spend as much as 80 - 100 hours per week working. Recall that for men the total number of hours worked correlates with TA scores and CHD.

Even though there is a paucity of information concerning sex differences and the TABP, several important things are known. For example, the prevalence of CHD is at least four times higher among extreme TA females than extreme TB females. Furthermore, the TA scores for employed women were almost identical to TA men. Employed women have

higher TA scores than housewives and full-time employed females had higher TA scores than females not employed outside the home.

With women entering fields and seeking positions heretofore reserved mainly for men, a controversy has arisen: will women experience more stress-related diseases? Suggestive evidence for a potential link between improved job opportunities and stress-related illness has been documented. Women whose most recent occupation was "higher status" have higher TA scores than women in "lower status" occupations. Recent research shows an increase in such stress-related illnesses as headache, muscle pain, allergies, colitis, high BP, URIs, heart problems, ulcers, and menstrual distress.

1.K INTERVENTION: MANAGEMENT AND ALTERATION OF THE CPBP

As has already been presented in this paper, a great deal of research effort has been directed toward identifying the CBPB, developing ways of measuring the extent of its existence, and demonstrating its potential relationship with CHD and a variety of primary coronary risk factors. On the other hand very little attention has been given to altering or coping with the behavior pattern. The reasons for this state of affairs are probably multifaceted, but at least two considerations stand out: first, all of the work concerning

the CPBP is relatively recent and as is characteristic in the evolution of a scientific construct, initial concern has been directed to establishing the existence of a phenomenon first, and of dealing with it only after its existence has been established. Second, the behavior pattern itself while different from is nonetheless closely related to the concept of personality and personality traits. The traditional belief that personality is difficult if not impossible to change has been a long held one by many members of both the medical and behavioral science community.

Approaches to dealing with the CPBP can be characterized as either management or alteration strategies and/or techniques. In the former case little or no effort is made to change the behavior pattern; rather the focus is upon helping the individual counteract the possible ill-effects that might accrue from his or her behavior pattern. Methods in this category include relaxation techniques, biofeedback, and psychopharmacology. The alteration approaches include individual and group therapy and a variety of techniques which may be most accurately described as behavior modification strategies. Each of these two major categories of approaches to dealing with the CPBP will be examined in turn.

1.K.1 (1) Management Approaches

While the line which demarks the management and intervention approaches is sometimes indistinct, relaxation training tends to be a method of managing rather than altering the CPBP. In fact, most of the treatment programs have focused almost exclusively on managing stress and tension without adequate attention to other components of the TABP. Thompson (1976) used a deep muscle relaxation exercise or listening to music in her two experimental groups. Curtis (1974) focused mainly on autogenic training and rhythmic breathing. Krumboltz's (1979) experimental group learned various relaxation techniques such as meditation, autogenic training, biofeedback, and progressive relaxation. Suinn (1974), Suinn and Bloom (1978) and Baskin (1979) provided anxiety management training.

Finally, some work has been reported dealing with the use of various drugs. The sedative and B- adrenergic blocking agents have received some support as TABP managers in studies showing that biochemical responses to stress may be depressed by their useage (Sigg, 1974). He suggests that blocking agents might very well be effective in a program designed to alter the ways in which CPBP individuals deal with their enviornment.

In general, then, there is very little research that directly bears on the management of TABPs and their effects. While some of the work which has been done is suggestive, very few even tentative conclusions can be drawn despite the claims of enthusiastic advocates the various management approaches have not been subjected to the kind of rigorous study necessary to justify claiming their effectiveness in managing the TABP.

1.K.2 (2) Alteration Approaches

Friedman and Rosenman (1974), pioneers in studying TABP, are strong advocates of alteration. They suggest numerous strategies for changing one's behavior patterns including seeking out work in a milieu that promotes peace, attending to speech patterns, foregoing attempts to always have work completed by the end of the day, searching for aloneness, and re-engineering hostility. Unfortunately they provide very little evidence that (a) such strategies can be effectively implemented and (b) the probability of CHD is decreased as a result of alteration attempts.

There is some meager evidence available that the TABP has been altered in a few individuals as a consequence of psychotherapy. Rahe (1975) used brief group therapy sessions among 40 of 60 patients who had previously experienced a MI. The group receiving therapy experienced

fewer re-hospitalizations over an 18 month period than did 20 controls. Rahe (1975) reports that therapy patients, in addition to displaying greater knowledge of their disease, also modified previous behaviors such as rushing to meet deadlines, overworking etc.

Roskies, Spevack, Surkes, Cohen, and Gilman, (1978) attempted to reduce CHD risk in healthy men by modifying their TABP. The subjects were randomly assigned to either psychotherapy or behavior therapy groups. Results indicated lower Ch, triglyceride and BP levels for both groups following treatment. At six month follow-up the effects of behavior therapy were more durable than the psychodynamic approach (Roskies et al., 1979).

Jeni and Wollersheim (1979) compared Suinn and Bloom's (1978) anxiety-management training to cognitive therapy and a wait-list control. Among subjects with highest TABP characteristics, cognitive therapy produced the greatest reduction in self-rated TA behavior, and both treatments led to reductions in state anxiety.

Finally, Levenkron, Cohen, Mueller, and Fisher (1983) compared three treatments for modifying the TABP. Comprehensive behavior therapy emphasizing self-control procedures, and group support encouraging change in TABP targets but without behavioral techniques, were contrasted to brief information a minimal treatment control. Their

results showed that many TABP components were significantly reduced by comprehensive behavior therapy and group support.

Since the CPBP consists of a constellation of behaviors which were learned as a method of dealing with the environment, it is at least theoretically possible that these same behaviors can be unlearned and new, less destructive ones, substituted. Such are the assumptions behind the behavior modification approach to dealing with the behavior pattern. Most of the work in this area has been done by Suinn.

Suinn's efforts center on his Cardiac Stress Management Program (CSMP), which is designed to encourage different life styles and different environmental responses so that the individual's TABP is replaced by a less harmful one (Suinn, 1975). In one evaluation study (Suinn, Brock, & Edie, 1975) post-coronary patients underwent CSMP while a control group did not. Data reported indicate that 88% of the CSMP group reported substantial changes in life style. However, this study did not include measurement of the TABP, thus the evidence they provide is, at best, indirect.

It is obvious that comparatively little research dealing with managing or altering the TABP has been undertaken and reported. While there are indications that various techniques might affect the behavior pattern itself and/or the risk factors which may be associated with it,

only the most tentative of conclusions can be drawn and the conclusions themselves must be very non-specific in nature at this time. Friedman, Thoresen, Gill, Ulmer, Thompson, Powell, Price, Elek, Rabin, Breall, Piaget, Dixon, Bourg, Levy, and Tasto (1982) believe this is due to the fact that sample sizes were small and the duration of treatment was too short. They, therefore, recruited 1035 subjects for a five-year project to determine whether the TABP can be modified. Their results show that after the first year the rates of infarction and cardiovascular death were lower for the groups receiving both cardiovascular education and behavior therapy followed by the behavioral counseling only group, then the cardiologic counseling only group, then the controls. This are only results of the first year, however, they do appear promising and lend credence to the fact that the TABP can be modified.

1.K.3 Summary

Approaches to treatment of the CPBP can be characterized as either management or alteration strategies. In the former little or no effort is made to change the behavior pattern; instead the focus is on helping the individual counteract the possible ill-effects due to the behavior pattern. Methods used in this approach include relaxation techniques, biofeedback, and psychopharmacology. The alteration approach is designed to change the behavior

pattern and include a variety of techniques which may be most accurately described as behavior modification strategies.

The treatment approaches to date have met with only minimal success. There are several explanations for this. In most studies, the sample sizes were too small to achieve statistical significance. In addition, the duration of treatment was too short. Finally, and perhaps most importantly, intervention strategies have been too general with the aim of changing the entire pattern irrespective of the amount or degree of components present in the various individuals.

The focus of research is shifting toward alteration of specific components that correlate with CHD rather than attempts at total pattern modification. These studies are too young to be decisive but do show promise.

CHAPTER 2

RATIONALE

Currently, heart disease the leading cause of death in the U.S. Physicians are unable to predict even half of the new cases each year with traditional risk factors. Because of this, attention is being turned to the TABP as a prediction factor. Considerable research effort has gone into the identification of the TABP, to the development of techniques for classifying with respect to the presence and degree of this behavior pattern, and to establishing a "risk factor" relationship between the TABP and CHD (Friedman & Rosenman, 1974; Glass, 1977b; Jenkins, 1976; Zyzanski et al., 1976). However, little attention has been given to what extent the behavior pattern is characteristic of persons other than white, middle-class, middle-aged males in the U.S. Furthermore, relatively little is known concerning the psychological perspectives in any population other than the one just mentioned.

Research that targets on other populations is essential in answering the questions posed above. Using females as a population is important for several reasons. Women represent the largest subculture in the U.S. Extensive research with this group will help identify the TABP as a generalizable behavior pattern that is characteristic of populations other than white, middle-aged, middle-class American males. Furthermore, to date, premature CHD mortality has been characteristic of the just mentioned group of males. Now with women entering the workforce at a rate heretofore reserved for men it is predicted that stress-related illness including CHD will increase in these women and possibly equal that of the males. In fact, evidence to support this concern is beginning to accumulate (Waldron, 1978).

Few researchers to date have studied a population other than males. Those that have suggest that the TABP is correlated with the prevalence of CHD in women. Furthermore, in women, as in men, most of the risk associated with the TABP does not act via the standard risk factors. In addition, the TABP has been found to be more prevalent among employed women than among housewives (Haynes et al., 1978). Additional research by Waldron suggests that women who display the TABP may be more likely than TB women to seek employment (Waldron, 1978).

The proposed study will attempt to describe certain of these psychological characteristics in a population of working women. To do this, a number of hypotheses were generated. The first hypothesis projected that TA women would show higher scores on each of the descriptive subscales of the JAS (Factors S, J, H). In addition to these TA characteristics, the second hypothesis expected TA women to have higher scores on the Novaco Anger Inventory. The anger/hostility component of the TABP is one of three components of the behavior pattern shown to be directly related to CHD. Therefore, it seems important to assess the degree of anger arousal in TA women vs TB women.

Since these are employed women the PWE will be administered in order to ascertain any differences in the perceptions of the work environment from the perspective of the TA and from the TB. The 11 factors making up the PWE allow for assessment of a variety of work situation dimensions. The third hypothesis that TAs will perceive less support, more competition on the job, and be more career oriented than TBs will be assessed via the PWE.

Since the majority of employed women are TA, and with women working in more traditionally male-dominated fields, differences in the way TAs and TBs characterize themselves on the BSRI is to be assessed. The fourth hypothesis assumes that TA women will endorse more masculine items than

TB women and will, therefore, be more androgenous than their TB counterparts.

In addition to the above psychometric measures, analysis of certain components in the blood of these women will be conducted. To date only a few different types of physiological assessments have been attempted. These have focused on the same components, namely BP, HR, NE, Ch, TTG, etc. Moreover, the work to date has been inconsistent. Researchers have used different types of challenging situations and have found that different challenges elicit different physiological response patterns. At this point, no studies have attempted to assess differences in any other biochemical components, nor have they looked at these components in a steady (i.e., not challenged) state.

Changes in various compounds in the blood, along with BP and HR, evident in TAs correspond to changes in stressed populations. These changes lead to the fifth and final hypothesis--that TAs can be classified as a chronically stressed population on the basis of their physiology. The purpose of the biochemical assessment component of this study is to provide information for the construction of profiles from absorption spectra of blood plasma belonging to TA and TB individuals, in order to characterize differences between non-stressed TB and stressed TA individuals. The aim is to find differences characteristic

of specific pathophysiological conditions that deviate from normal profiles. Such differences could be correlated with increased risk of CHD and their early identification could facilitate the early prediction of persons at risk. Also such knowledge could be applied to the formulation of both pharmacological and behavioral interventions designed to reduce the risk of such disease.

CHAPTER 3

MATERIALS AND METHODS

3.0.1 Overview.

Working women in the Roanoke and Blacksburg areas were recruited through newspaper, radio, and a general mailing (see Appendix B). A total of 157 women responded and were sent an information packet which contained a General Survey and opscan form along with a health information sheet (see Appendix A). Upon completion of these forms respondents were assessed for suitability and scheduled into an assessment session. A woman was deemed suitable if she was below 55 years of age and pre-menopausal. The assessment sessions involved the completion of several psychometric instruments along with a blood sample (description to follow).

3.0.2 Subjects.

The subjects were 94 working women from the Roanoke and Blacksburg areas. These women ranged in age from 30 - 53. See Table 3.1 for a summary of population demographics. The final selection of subjects was based on the TA scores from the JAS TA scale.

3.0.3 Dependent Measures (see Appendix C).

Type A Measures . The JAS (Jenkins et al., 1967) and the Framingham TA scale (Haynes et al., 1978) were used to differentiate the A-B personality types. The Framingham contained 10 items and yielded an overall A-B score. The JAS contained 52 items and the A-B classifications ranged from A1 - B4 along with three a priori factor scores: Factor H (Hard-Driving Competitiveness), Factor S (Speed and Impatience), and Factor J (Job Involvement). This survey was computer scored according to the standard hand-scoring procedure using a set of discriminant function weights (Psychological Corporation, 1979).

Anger assessment . The 80-item Novaco Anger Inventory (Novaco, 1977) was used to obtain a measure of overall anger arousal. This device covered a broad range of provocation incidents and allowed participants to rate their degree of anger arousal on a 5-point scale. A total anger score was obtained for each subject.

Table 3.1. Population demographics. Classifications based on percentage of total TA and TB in each category.

Population Demographics	TA(%)	TB(%)
<u>Age Range</u>		
25 - 30	31%	30%
31 - 35	25%	27%
36 - 40	17%	19%
41 - 45	14%	13%
46 - 50	7%	5%
51 - 55	5%	3%
<u>Marital Status*</u>		
Single	15%	10%
Married/long-term relationship	22%	56%
Divorced/separated	83%	37%
<u>Occupation</u>		
Secretary/clerical	14%	21%
Manager/supervisor	11%	7%
Faculty	21%	19%
Administration	14%	2%
Professional/technical	11%	24%

*Percentage greater than 100% due to overlap.

Perceived Work Environment Scale (PWE, Newman, 1977).

This 60-item inventory was designed to describe a variety of work situations. This instrument is composed of 11 separate factors. These factors are as follows:

Factor 1: Supervisory style--the extent to which the supervisor is open, supportive, considerate.

Factor 2: task characteristics--the extent to which the jobs are characterized by variety, challenge, etc.

Factor 3: performance-reward relationships--the extent to which rewards are based on performance rather than on other considerations such as favoritism.

Factor 4: co-worker relations--the extent to which co-workers are trusting, supporting, friendly, cooperative.

Factor 5: employee work motivation--the extent to which employees show concern for the quality of their work, try to get ahead, are involved in their work, etc.

Factor 6: arrangement of equipment and people--the extent to which the arrangement of the equipment and people allow for efficient and effective work.

Factor 7: employee competence--the extent to which the employees have the proper background, training, and "know how" to do what is expected of them.

Factor 8: decision making policy--the extent to which employees take part in decisions that affect their work situations.

Factor 9: work space--the extent to which employees have adequate work space and freedom to move about.

Factor 10: pressure to produce--the extent to which there are pressures to produce.

Factor 11: job responsibility/importance--the extent to which employees see responsibility as part of their job and the work as necessary to the successful operation of the organization.

Participants rated their satisfaction to these work-related situations on a 5- point scale. Each factor was individually scored to yield a total factor score. There were of course 11 of these scores.

Bem Sex Role Inventory (BSRI, Bem, 1974). This 60-item inventory was designed to assess endorsement of masculine or feminine characteristics to describe themselves. The BSRI is composed of three separate scales: masculinity, femininity, and social desirability. Each person received four main scores, one for each of these scales and an androgyny score. This instrument allowed participants to rate their satisfaction with a variety of work-related situations on a 5-point scale.

The 60-item Bem Sex Role Inventory (BSRI, Bem, 1974) was used to obtain a measure of any differences between TA and TB on this dimension. The BSRI is composed of three scales: masculinity, femininity, and social desirability. Respondents rated, on a 7-point scale, how well each item described herself.

Physiological Measure. A 5 ml blood sample was obtained from each participant. The sample was taken either by a certified medical technologist or a registered nurse. The samples were collected using a 5 ml B-D Vacutainer brand collection tube containing 0.048 ml of a 15% EDTA solution to prevent clotting. 21G x 1 1/2" venoject multi-sample needles were used with the vacutainer tubes.

3.0.4 Procedure.

Each subject was scheduled for a one-hour assessment session. In Blacksburg, a small class room in Wallace hall was used by the subjects during completion of the psychometric forms. The Roanoke participants completed forms in the large waiting area at the Hollins College infirmary. Each participant was given a folder, with their code number, containing the following items: instructions, informed consent, JAS, Framingham, Novaco, PWE, BEM, and opscans for each. Subjects were taken one at a time to the blood collection room where the consent form was witnessed and the blood sample taken. Upon completion of the blood sampling the subject returned and finished the remaining forms. Approximately 10 subjects were assessed per hour. Only code numbers appeared on the forms and blood samples.

Soon after blood collection the samples were centrifuged at 3000rpm for 20 minutes using a desk top clinical centrifuge in order to separate plasma. The plasma was transferred into 5 ml storage tubes, capped, and frozen until the time of analysis.

Hematocrites were obtained for each subject by using the total volume:packed cell volume ratio method to determine the percentage of red cells (Colmano, 1984 personal communication). Normal hematocrites for females range between 36% and 48% of total volume (). The above

method for obtaining hematocrites was checked for validity by using the standard finger-prick centrifugation method on a random sample of subjects.

Coded plasma samples were thawed and diluted to three concentrations (1:10, 1:100, 1:10,000). Samples were then individually scanned by a Varian-Cary 219 recording spectrophotometer from 650nm to 186nm. 465 data points for each sample were entered directly into the IBM 370 computer system of Va. Tech via a microprocessor controlled interface using a Decwriter II. The absorbance peaks at 195nm for the double bonds of proteins, at 278nm for the aromatic amino acids of proteins, at 414nm for the hemoproteins, at 610nm for ceruloplasmin, and their ratios were used as markers for testing by discriminant function analysis (Colmano, 1983).

CHAPTER 4

RESULTS

4.A COMPARATIVE ANALYSES

The JAS was computer scored via a program based on the hand scoring instructions (Psychological Corporation, 1979). This program was checked for accuracy by hand scoring random profiles. In every instance the hand scored profiles were identical to those scored via the computer program.

Exploratory analyses were conducted on all 20 variables generated by the 5 psychometric instruments. Extreme TAs (N=21) and TBs (N=16) were compared on each variable by stepwise t-tests (Barr, Goodnight, Sall, Blair, and Chilko, 1979). The first t-test assumed equal variances and the second assumed unequal variances. A correlation matrix was then generated for all measures in order to determine which variables were important in predicting the TABP. All results reported below are in terms of differences between TA and TB scores.

4.A.1 TA/TB Classification

The JAS Type A scale was used to make the classifications as to TA and TB. The mean score of the TA group was $94.12 \pm .86$ and the mean score of the TB group was 33.41 ± 1.9 . This difference was significant at the $p = 0.0001$ level.

It was shown through the use of the JAS Type A scale that the population being studied did contain distinctly separable groups of TA and TB women. This finding justified the comparisons between TA and TB women on the various psychometric and physiological measures reported below.

4.A.2 Hypothesis 1: TAs Will Show More Job Involvement, More Speed and impatience and will be more hard driving and competitive than TBs.

Table 4.1 summarizes the differences between the TA scores and the TB scores on the three descriptive scales of the JAS used to test this hypothesis. On the speed and impatience scale of the JAS the mean TA score was 77.68 ± 5.3 while the mean TB score was 30.00 ± 4.3 . This difference was significant at the $p = 0.0001$ level. There was also a significant difference ($p = 0.0024$) between TAs

Table 4.1. A Comparison of Type A and Type B Means on the Descriptive Scales of the JAS.

JAS scales	Type A X \pm SD	Type B X \pm SD	p values
Factor S [^]	77.68 \pm 5.3	30.00 \pm 4.3	0.0001*
Factor J [^]	81.69 \pm 5.4	54.23 \pm 6.1	0.0024*
Factor H [^]	71.76 \pm 4.0	22.07 \pm 5.4	0.0001*

*Indicates significance.

[^]Factor S = speed and impatience scale

[^]Factor J = job involvement scale

[^]Factor H = hard-driving and competitive scale

and TBs on the job involvement scale with the TA mean being 81.69 ± 5.4 and the TB mean being 54.23 ± 6.1 . TAs were also shown to be more hard-driving and competitive. The TA mean on this scale was 71.76 ± 4.0 and the TB mean was 22.07 ± 5.4 . This difference was significant at the $p = 0.0001$ level. The intercorrelation among these scales was low, ranging from 0.11-0.42.

In summary, the results (see Table 4.1) did indeed show that TAs were more involved with their jobs than TBs. TA women showed a greater sense of time urgency (speed and impatience) than did TB women. Also, TA women were shown to be more hard-driving and competitive than TB women. These results confirm the first hypothesis.

4.A.3 Hypothesis 2: Significant Differences Between TAs And TBs will be seen on the Novaco Anger Inventory.

Analysis of the Novaco anger inventory (see Table 4.2 for results) revealed that TAs exhibited higher levels of self-reported arousal to the provocation situations than did TBs ($p = 0.05$). The Novaco anger inventory is composed of two basic types of provocation situations. One kind of provocation deals with situations that are threatening to one personally or to one's possessions. The other main type

Table 4.2. A Comparison of the Type A and Type B
Scores on the Novaco Anger Inventory.

Type A X \pm SD	Type B X \pm SD	p values
298.81 \pm 8.9	275.48 \pm 10.0	0.051

of provocation situation involves incidents that happen to others that for the most part take the form of injustices, prejudices, or matters of principle. The items on the Novaco were classified in an a priori fashion into two groups that represented the above types of situations. TA and TB responses were then analyzed via t-tests on mean group scores. TAs were shown to respond more often with anger arousal to the situations that were threatening to themselves or their possessions ($p = 0.002$). TBs, on the other hand, were more aroused to situations that involved injustices to or prejudices against others ($p = 0.01$). It therefore, seems that the anger experienced by these women depends on the kind of provocations to which they are exposed.

These results indicated that TA women do display more overall anger arousal than do TB women on all items of the Novaco. Furthermore, TA women respond with much more arousal to situations that threaten their personal worth and with less arousal to incidents that involve injustices and prejudices against people other than themselves. TBs on the other hand, respond with less arousal in general and when provoked, the situation more likely involved acts against others taking the form of prejudices and injustices.

4.A.4 Hypothesis 3: TAs Will Perceive Their Work Environment differently from TBs.

This hypothesis was tested with the PWE scale. This instrument is composed of 11 separate factors that assess different aspects of the work environment. There were significant TA/TB differences on 3 of these factors (see Table 4.3). The mean TA score (37.64 ± 1.2) was significantly higher ($p = 0.023$) than the mean TB score (31.63 ± 1.7) on factor 2, task characteristics, a scale that measured the extent to which their jobs were characterized by variety and challenge. Likewise, the mean TA score of 21.37 ± 1.0 was significantly higher ($p = 0.039$) than the mean TB score of $17.09 \pm .96$ on the factor measuring pressure to produce (factor 10). On factor 4, co-workers, a scale that measures the extent to which the individual feels her co-workers are trusting, supporting, friendly, and cooperative, TAs scored significantly lower ($p = 0.049$) than did TBs with mean scores of $17.44 \pm .87$ and $19.82 \pm .05$ respectively.

An important question must be asked at this point addressing whether or not the above differences were due to TAs perceiving their work environment differently than TBs or due to actual differences in the occupations of these women. If one considered the information in Table 3.1 these

Table 4.3. A Comparison of Type A and Type B Scores on the 11 Factors of the Perceived Work Environment Index.

PWE Factors	Type A X \pm SD	Type B X \pm SD	p values
Factor 1=super- visory style	39.75 \pm 2.0	42.91 \pm 1.9	0.295
Factor 2=task characteristics	37.64 \pm 1.1	32.36 \pm 1.7	0.023*
Factor 3=perfor- mance-reward relationships	17.44 \pm .88	18.45 \pm .84	0.432
Factor 4= co-workers	17.44 \pm .87	19.88 \pm .05	0.049*
Factor 5=employee work motivation	17.62 \pm .68	16.91 \pm .57	0.460
Factor 6=equipment and person arrange- ment	14.06 \pm .82	14.64 \pm .33	0.529
Factor 7=employee competence	17.56 \pm .91	18.36 \pm .49	0.448
Factor 8=decision making policy	14.62 \pm .79	14.36 \pm .71	0.819
Factor 9=work space	8.44 \pm .78	9.55 \pm .70	0.330
Factor 10=pressure to produce	20.65 \pm 1.0	17.09 \pm .96	0.039*
Factor 11=job responsibility	31.12 \pm 17	22.92 \pm 7.4	0.618

*Indicates significance.

women did in fact represent a variety of occupations.

In order to answer this question, the groups with the largest number of extreme TAs and TBs (administration, faculty, and technical) were analyzed via analysis of variance (ANOVA). In the ANOVA model there were two levels of "type" variables (TA or TB) and there were three levels of "group" variables (administration, faculty, and technical). The 11 PWE factors were the dependent variables (see Table 4.5 for summary of ANOVA).

In two cases there were significant interaction effects. On factor 2, task characteristics, there was a significant difference ($p = 0.05$) between TA and TB scores. In addition, there was a significant type*group interaction ($p = 0.05$). Likewise, on factor 10, pressure to produce, there was a significant difference ($p = 0.02$) between TA and TB scores. Also, there was a significant type*group interaction ($p = 0.006$). Factor 4, co-workers, was not significant using the ANOVA procedure for these three groups. The most likely explanation for this was the loss of power of the test due to decreasing the degrees of freedom by decreasing the N. Further analysis (Duncan's multiple range) showed that the group "responsible" for these interaction effects was the administration group.

Table 4.4. Summary Statistics for the Analysis of Variance Procedure on the Perceived Work Environment Factors.

Dependent Variables	Degrees of Freedom	Sums of Squares	F Value	PR > F (p value)
<u>Factor 1</u>				
Type*	1	4.537	0.07	0.79
Group**	2	55.533	0.45	0.65
Type+Group	2	155.578	1.27	0.32
<u>Factor 2</u>				
Type	1	84.448	4.44	0.05
Group	2	50.235	1.32	0.30
Type+Group	2	146.790	3.86	0.05
<u>Factor 3</u>				
Type	1	1.959	0.18	0.68
Group	2	15.772	0.72	0.51
Type+Group	2	20.876	0.95	0.42
<u>Factor 4</u>				
Type	1	5.442	0.71	0.42
Group	2	40.547	2.64	0.11
Type+Group	2	22.273	1.45	0.28
<u>Factor 5</u>				
Type	1	10.015	2.57	0.14
Group	2	7.855	1.01	0.40
Type+Group	2	9.097	1.17	0.35
<u>Factor 6</u>				
Type	1	0.300	0.03	0.86
Group	2	2.156	0.11	0.89
Type+Group	2	17.320	0.91	0.43

*Type refers to TA or TB

**Group refers to administration, faculty, or technical

Table continued on next page

Table 4.4 cont.

Dependent Variables	Degrees of Freedom	Sums of Squares	F Value	PR > F (p value)
<u>Factor 7</u>				
Type	1	2.253	0.39	0.55
Group	2	21.149	1.81	0.21
Type+Group	2	1.149	0.10	0.91
<u>Factor 8</u>				
Type	1	6.955	1.21	0.30
Group	2	25.622	2.23	0.15
Type+Group	2	13.204	1.15	0.35
<u>Factor 9</u>				
Type	1	2.377	0.23	0.64
Group	2	0.390	0.02	0.98
Type+Group	2	6.488	0.31	0.74
<u>Factor 10</u>				
Type	1	48.000	7.33	0.02
Group	2	14.444	1.10	0.37
Type+Group	2	112.150	8.57	0.006

These results indicate that TA women do perceive certain differences in their work environment that TB women do not. TAs perceived more pressure to produce on the job than did TB women. TA women also perceived their co-workers to be less friendly, less supportive, less trusting, and less cooperative than did TB women. Lastly, TA women perceived their jobs to be more challenging and have more variety than did TB women. These differences represented what appeared to be differences in perceptions of TAs and TBs irrespective of actual environmental influences. However, when placed in a particularly challenging environment (in this case, administration) there was also a significant environmental effect on the perceptions of TA women that did not influence the perceptions of TB women in the same field. Within this group, the TA women perceived more pressure to produce than did TB women. In addition, the TA women perceived their jobs to be more challenging and contain more variety than did TB women in the same field. It therefore seems that the environment significantly influences TA behavior at least with regard to perceptions of their work conditions.

4.A.5 Hypothesis 4: TAs Will Endorse More Masculine characteristics than TBs.

This hypothesis was verified via the BSRI. The results summarized in Table 4.5 do indeed confirm this hypothesis. The BSRI is composed of 3 independent scales: masculinity, femininity, and social desirability. The mean score on the masculinity scale for TAs ($4.32 \pm .31$) was significantly different ($p = 0.045$) from the mean of the TBs ($2.11 \pm .91$). Results of the social desirability scale indicate that TAs tend to respond in a more socially desirable direction than do TBs. The mean score of for TAs was $6.31 \pm .32$ while the mean score for TBs was $3.51 \pm .37$. This difference was significant at the $p = 0.001$ level.

These results indicate that women possessing the TABP viewed themselves as possessing more masculine characteristics than feminine characteristics while TB women viewed themselves as having fewer masculine qualities. The fact that TAs rely on social approval was supported with the finding that TAs were definitely more concerned with social approval than were TBs. This was evident in their tendency to respond in a more socially desirable direction.

- 4.A.6 Hypothesis 5: Because Of Their Competitiveness, Job involvement, and career orientation, TAs will display the physiological responses of a chronically stressed population whereas TBs will not.

Table 4.5. A Comparison of Type A and Type B Scores on the Bem Sex Role Inventory.

BSRI scales	Type A $X \pm SD$	Type B $X \pm SD$	p values
Masculinity	4.32 \pm .31	2.11 \pm .91	0.045*
Femininity	2.99 \pm .45	4.00 \pm .36	0.085
Social Desirability	6.13 \pm .32	3.51 \pm .37	0.001*

*Indicates significance.

Sixteen variables in the blood plasma were analyzed via discriminant function analysis and canonical correlation (Nie et al., 1975). Preliminary results showed a strong trend approaching significance ($p=0.06$). The model was able correctly to classify 78.13 % of the population into TA or TB. The variables used in the discriminant analysis included variables 4,6,9; ratios 12, 13, 17, 27, 37; and BIL3. These correspond to higher than normal corticosteroids, ceruloplasmin, and protein levels, and lower than normal levels of glucose, ascorbic acid, and oxidation-reduction protein in blood plasma. These differences were observable and there was a trend toward significance, however these differences were not significant. Therefore, hypothesis 5 cannot be accepted.

4.B DISCRIMINATIVE ANALYSIS

The results reported above were based on comparative analyses between TAs and TBs. There were many factors on which TAs differed from TBs.

In order to determine which of these factors would be important in actually discriminating TAs from TBs all variables were pooled and a correlation matrix was constructed. The correlation matrix revealed 12 factors as important in discriminating TAs from TBs. These included: the JAS TA scale, the Framingham TA scale, Factor J, S, and H of the JAS, the Novaco anger inventory, the masculinity and social desirability scales of the BSRI, and factor 2-task characteristics, factor 4-co-workers, factor 7-employee competence, and factor 10-pressure to produce, of the PWE.

A discriminant function analysis and canonical correlation was performed on all variables that correlated moderately high (0.5 or greater). This analysis revealed the best model of independent predictors of the TABP in this population of working women to be: JAS TA scale, Framingham TA scale, JAS Factor S (speed and impatience), JAS Factor H (hard-driving and competitive), and PWE Factors 7 (employee competence), and 10 (pressure to produce).

CHAPTER 5

DISCUSSION AND CONCLUSIONS

The results obtained from this research supported the hypothesis that TA women differed from TB women on a variety of indices. TA women scored significantly higher on all three descriptive scales of the JAS. Also, as one would expect, the women classified as TA by the JAS were also classified as TA by the Framingham. TA women also scored higher on the Novaco Anger Inventory than did TBs. In addition, several factors on the PWE discriminated TAs from TBs. These included task characteristics, co-workers, and pressure to produce. Furthermore, on the factors measuring task characteristics and pressure to produce there was also a significant interaction between TA and the environment. The BSRI also generated significant differences between TAs and TBs indicating that the TA women endorsed more masculine characteristics while the TB women endorsed more feminine characteristics. In addition, TAs responded in a more socially desirable direction than did TBs.

Unfortunately, the differences between TAs and TBs on blood components were not significant. There are several explanations for this lack of significance. One obvious one is the small number of extreme TBs. The TAs represented an extreme range (above the 90th percentile on the JAS). However, the TBs did not represent this extreme a range (below the 35th percentile on the JAS). The physiological measures of stress used were indeed indicators of chronic stress and had proven effective in discriminating other stressed from non-stressed groups (see Colmano et al., 1984). This being the case, the explanations for lack of significance turn to the small number of TBs or the possibility that these women were not sufficiently stressed to show the physiological differences hoped for.

The results from this study were obtained from a very heterogeneous population. They were from two different cities and a range of professions (see Table 3.1). Therefore, it is believed that the results obtained here have broad generalization.

There are, however, limitations with this study. This population represented a rather narrow geographical and cultural region. This makes generalizing results to other populations somewhat tentative. In addition, these subjects were all volunteers. It is possible that subjects who volunteer might differ from those who do not. Furthermore,

with the exception of the blood samples, all measures were self-report and therefore subjective. However, despite these limitations, the results obtained in this study were significant.

The TABP is becoming increasingly important in women. The literature demonstrates that the TABP is more prevalent in working women than in housewives (Waldron, 1978). This is significant considering its risk factor relationship to CHD and considering that at least 50% of all women of working age in this country do in fact work. In this population, the CHD rate for TAs is four times higher than for TBs. If one considers that CHD often takes decades to develop before symptoms appear, it is important to identify risk factors in this population as soon as possible. In fact, a review by Waldron (1976) pointed out that many stress-related illnesses were already increasing in women. She pointed to new work-related stressors as responsible for a significant portion of this increase. In addition, these women were adopting a variety of behaviors to help them deal with this increase in stress. Many of these behaviors carry a substantial health risk in and of themselves. Take smoking and alcohol use as an example. Smoking in the general population has decreased but in women it has increased. Alcohol use has also risen dramatically in this population since the early 1960s (Morse, and Furst, 1982). It has been speculated that if this trend continues

unabated, the CHD rate in women will equal that of men within 20 years.

It seems obvious that this trend needs to be reversed, or at the very least, arrested. However, before one can intervene with a population one must first understand that population. To date, very little has been done to understand the TABP in women. Instead, researchers have attempted to generalize their findings from the typical population being studied (i.e., white, middle-class, middle-aged, American males) to women. This has resulted, for the most part, in inconsistencies and confusion. For example, the tasks researchers used to challenge males did not appear to challenge females (MacDougall et al., 1981). In addition, TA females responded with less physiological arousal to challenging situations than did TA males (Manuck et al., 1978). And, in situations that were competitive TA females demonstrated more physiological arousal than did TA males (VanEgeren, 1979a). In order to understand the TABP and its related psychological dimensions in women researchers must directly study this population. That was the intent of the study reported herein. Several specific questions were posed in an attempt to discover some of the TABP dimensions related to a population of working women.

The results obtained in this study indicated a number of factors upon which TA women differed from TB women. TA women were shown to be more hard-driving, more competitive, and more concerned with time pressures than were TB women. These results fit with Price's (1982) explanation that the TA woman has two proving grounds--the workplace and the home. Because she feels her self-worth is the result of her accomplishments she strives for perfection. This sets the stage for development of the hard-driving, competitive behavior believed necessary in order to be the best at work, the best housekeeper, and, when married, the best wife and/or mother. These demands lead to considerable time pressures. The amount of time a TA woman must devote to achieving perfection in all these areas results in her sense of time urgency evidenced by the speed with which she does things and the impatience she displays at interruptions or things and people who slow her down.

The second finding, that TA women reported more anger arousal than TB women, was also an important one. Of the many components comprising the TABP, there were several that directly correlated with CHD. One of these was the anger/hostility component. In fact, Williams et al. (1980) showed that anger/hostility actually correlated higher with atherosclerosis than did the TABP.

There are several cognitive factors that might be useful in explaining the increased anger/hostility in TAs. One is self-esteem. Related to self-esteem is the belief that she has to prove her worth by a never-ending series of accomplishments without which she feels inadequate. Obstacles to these accomplishments are met with hostility as an attempt to regain control. These accomplishments are tangible and quantifiable. The measure of success is through the number of accomplishments and material worth. It was not surprising, therefore, to find that while TAs did respond with more arousal than TBs the provocations that accounted for this arousal involved direct threats to them personally or to their possessions. It appeared that, to the TA woman, her material possessions and tangible accomplishments were analogous to her self-worth. Therefore, threats to those possessions and accomplishments were perceived as threats to her self-worth and a not unexpected response to such threats is anger and hostility.

The finding that TAs did not report as much anger arousal to situations that threatened others was in keeping with the above explanation. Incidents that threaten someone else were not direct challenges to her accomplishments or possessions. This being the case, she felt no threat to her self-worth and therefore, no need to control the situation in order to deal with the threat. Also, considering the competitive nature of the TA woman and her

reports of less cooperation and trust from others, it is not surprising that she felt less need to respond to the difficulties of others.

TB women on the other hand, reported more cooperation with and less competition between themselves and others. Furthermore, TBs were less likely to evaluate their self-worth in terms of tangible, quantifiable accomplishments and possessions. Therefore, it was consistent with this ongoing line of reasoning that TBs were less aroused than TAs to provocations of this sort. In addition, their sense of cooperation and caring for others resulted in TBs being more provoked by situations that involved injustices and prejudices against others.

Personality differences between the TA and the TB resulted in different perceptions of the work environment. TA women perceived less social support, less trust, and less cooperation from co-workers. They reported fewer friendships with co-workers. They also perceived more pressure to produce and felt their job involved more variety and challenges. Lastly, they tended to be less satisfied with the physical aspects of their environment such as work space and equipment.

In addition, it was shown that a TA woman placed in a challenging environment (such as administration) perceived increased demands of that situation that TBs did not perceive. It seemed likely that, within a limited context, the TABP in these women could be conceptualized as an interaction between an individual's behavior and circumstances in the environment. This description of TA as an interaction between behavioral and environmental factors fits very well with the cognitive social learning approach described in chapter one. This model emphasizes the interdependence of a person's behavior, specific environmental settings, and certain cognitive activities that mediate it (see Figure 2). With regard to the interaction seen in this study the TA perceptions can be accounted for by the reciprocal interaction between personal (i.e., behavioral, cognitive) and environmental factors. The TA engages in beliefs and fears that serve as cognitive mediators in her behaviors. She typically feels that she must constantly prove, by her accomplishments, that she is successful. In order to achieve success, she must meet the demands of every situation. Her hard-driving and competitive achievement striving behavior is seen as necessary and highly valued since it has the very positive short-term consequences of meeting the demands. When her environment (such as administration) is challenging the TA woman is more sensitive to that situation. Her

susceptibility, along with the challenges of her environment, will result in the TA behaviors seen as necessary in order to control that environment.

It is likely that the higher incidence of the TABP in males is due to socialization. The TABP is reinforced more in males than in females, since this hard-driving, aggressive style of behavior appears to contribute to success in traditional male roles, but not in traditional female roles. For example, adults who are more TA have repeatedly been found to have more education, higher status occupations, and higher income than TBs (Mettlin, 1976; Shekelle et al., 1976; Waldron, 1976; Zyzanski, 1977). In contrast, the CPBP does not appear to contribute significantly to success in traditional female roles. Among women in college, those who are more TA are less likely to have a boyfriend or frequent dates, and they are less satisfied with their relationships with men (Waldron, 1978). Among middle-aged women, those who are more TA are not likely to be married, and if married, they have husbands of equal or lower status. (Waldron, 1978). Furthermore, as Waldron (1978) points out, middle-aged men who are more TA are more likely to be married.

If, as these data suggest, the CPBP contributes more to success in traditional male roles than in traditional female roles, it would not be surprising to find that such behavior

is encouraged more in boys than in girls. This is especially true in Western societies where the TABP appears to coincide in many respects with the stereotypic masculine roles. For example, experimental research has found TAs to be more aggressive than TBs (Carver & Glass, 1978). Also, males were more aggressive than females, according to a review of nearly 2,000 studies of sex differences in behavior (Maccoby & Jacklin, 1974). Indeed, it did not seem unreasonable to say that the word aggressive was firmly associated in most people's minds with masculinity.

Aggressiveness, however, was not the only characteristic of the TABP that has a counterpart in the masculine stereotype. Exaggerated achievement striving is also characteristic of TAs (Glass, 1977b), and a strong work orientation is often associated with masculinity. This would seem to stem from the male's culturally established role as a provider.

In summary, the behavioral style labeled as TA may be construed as being consistent with a number of characteristics that are commonly identified in our society as "masculine." This was the case in the present study. TA women endorsed significantly more masculine characteristics than did TB women. TA women also endorsed fewer feminine characteristics than did TB women. The TA women seemed to

possess many of the masculine qualities that accompany occupational success, but lacked the more nurturant qualities of women. They relied heavily on social approval as evidenced by their tendency to respond in a socially desirable direction to items of the BSRI. However, they seemed to lack many of the qualities necessary to receive that support. In fact, TAs reported inadequate social support on the jobs, from their families or from other women (Friedman and Rosenman, 1974).

The TABP is characterized by a set of action-oriented behaviors such as competitiveness, aggressiveness, speed and impatience. These behaviors themselves tend to over-activate the sympathetic nervous system as evidenced by the increases in NE, BP, HR, cortisol, etc. seen in TAs during a perceived challenging event. It has been shown, in the stress literature, that if these periods of over-activation occur often, then one's system will adapt to those periods resulting in a chronically aroused system. When the arousal becomes long-term, permanent physical changes occur.

Does the TA woman possess this chronically elevated physiological system? Unfortunately, for whatever reasons, the results obtained in this study failed to show significant differences. However, there were several components in the blood of TAs that were indicative of a

chronically stressed physiology. When compared to TB women, TAs showed higher corticosteroids, decreased ascorbic acid, increased glucose, and increased ceruloplasmin, protein and bilirubin levels in blood plasma. The compounds reflected physiological changes in the TA's metabolism similar to that of stressed individuals. Further research is warranted since several metabolites pointed to an over-active sympathetic nervous system possibly leading to CHD. The results are supported by the literature that shows increased sympathetic nervous system activity in response to short-term stressors. The TA's struggle to control seem to lead to chronic sympathetic over-activation. Therefore, the TABP may actually be an ineffectual set of coping skills that the TA woman acquires and performs in her attempt to deal with the environment.

In summary, empirical evidence describes the TA woman as follows: (1) a career oriented, job involved individual; (2) highly competitive both on the job and with other wives and mothers; (3) reliant on social support but perceiving little and not satisfied with either the quantity or quality of that support; (4) possessing many of masculine qualities reinforced in the work-world but lacking feminine qualities reinforced by society as a whole; (5) feeling a great deal of pressure to produce; (6) evaluating her self-worth through her accomplishments leads her to respond with hostility

and anger to anyone or anything that gets in her way or threatens her tangible possessions; (7) constantly struggling to produce and to control leading to a chronically over-activated sympathetic nervous system which is indicative of a stressed physiology. Additional descriptive demographic facts differentiating the TA female from the TB female showed that: (1) TA women tended to be single or a single parents; (2) TA women had a divorce rate of 83% while TB's divorce rate was around 37%; (3) TA women currently married or involved in a long-term relationship tended to be involved with persons who were less TA than themselves and who were reported to compensate for their TA behavior by being less hard-driving and less time urgent.

This assessment study is only a beginning. The ultimate goal of assessment should be thorough enough to lead to effective treatments. Many additional questions need to be answered concerning the TABP in women. Persons possessing the TABP are not a homogeneous group. They differ with respect to both the presence and degree of the components making up the behavior pattern. Furthermore, not all of the components are directly related to CHD. It is possible that, for these reasons, the "shot gun" approaches to treatment have proven relatively ineffective. Treatments must focus more specifically on particular aspects of the TABP with both primary and tertiary goals in mind. However, before this can be done, the population characteristics must

be understood. With the number of women in the workforce increasing, it follows that there will be concomitant increases in persons possessing the TABP. Considering it often takes decades for CHD symptoms to appear, the risk factors in women need to be identified as soon as possible if we hope to avoid the rate of premature heart disease in women currently evident in men.

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APPENDIX A

1. General Mailing Letter
2. Working Women and Stress General Survey
3. Health Information Form
4. Informed Consent

WORKING WOMEN AND STRESS

The number of women in the workforce is increasing at a rapid rate. Women are also entering fields and seeking positions traditionally occupied by men. With many of these positions come increased challenges and increased pressures.

Unfortunately, many of the stress-related illnesses that go along with work-related pressures are also increasing for women. One of the more serious of these stress-related illnesses is coronary heart disease.

At the present time, the incidence of heart disease is approximately two times higher in men than in women. Premature heart disease found in younger men who occupy positions with a great deal of perceived stress contributes significantly to this statistic.

Now that more women are in the workforce it is feared that in the near future the incidence of death from heart disease for women will approach that of men. In fact, women occupying positions that generate stress are shown to possess the same types of behavioral responses as do men that are at risk for heart disease.

Women are of course subjected to most of the same on-the-job pressures that affect their male counterparts. However, women are also subjected to many unique stressors such as family responsibilities and a lack of support at work and at home.

A project focusing on health-related issues and stress in working women is being conducted through the Psychological Services Center at Va. Tech. There are two purposes of the Working Women and Stress Project. The first and major phase of the project is a thorough assessment of the biochemical and psychological characteristics of women experiencing stress. The assessment sessions will involve completing several questionnaires and a small blood sample which will be taken by medical personnel. It is hoped that the results of this assessment

will further our understanding of the relationship between personality (and behavior) and physiological responses of women.

The second phase of the project (the treatment phase) is designed to help women deal with many of these unique stressors. Approximately 25% of the participants will be chosen for this phase. Those chosen for the treatment phase will participate in 12 one hour group sessions along with a third assessment session which will take place approximately 6 months after the completion of the last group session. Treatment groups will be conducted (at no charge to participants) in both Blacksburg and Roanoke.

If you are a working woman and are interested in obtaining more information about this program and contributing to the further understanding of the stress-illness process in women please call the Psychological Services Center at Va. Tech. (703/961-6914). Leave your name and number and the project director, Debra Weaver, will return your call. If you are not a working woman, or not interested, please pass this on to someone who might be interested in participating.

Please help us to make this a successful program and to begin a valuable service to women in this area.

WORKING WOMEN AND STRESS

GENERAL SURVEY

Dear Participant:

The present survey is designed to gather information from employed women. We plan to use the information obtained from this survey to develop a program specifically tailored to the needs and interests of the participants.

In order to insure confidentiality of your responses to this survey, your name will not appear anywhere on the question or answer forms. Instead, you will be assigned a code number which you will be asked to use on all forms you complete.

In order to facilitate the tabulation of this survey you are asked to use the enclosed answer sheet (called an opscan form).

Opscan instructions:

Use a number 2 pencil.
Fill in circles darkly and completely.
Make only one response per line.
Do not fold, bend, or mutilate.
Begin on line #2.
Do not make any marks above line 2 on the opscan form.

We appreciate your time and effort in completing this survey. It should take you approximately 35 minutes to complete. Please return the survey, opscan form, and health information form within 7 days to the location most convenient to you (see enclosed locations).

Thank you.

Sincerely,

Debra A. Weaver

Code # _____

**WORKING WOMEN AND STRESS
GENERAL SURVEY**

*Please read each of the following carefully. Choose ONE response for each question. With a #2 pencil, darken in the appropriate circle on the opscan provided (see example).

*Please answer all questions unless otherwise specified. Only one response per line.

*Note: For responses which require elaboration, please write your comments on this question form not on the opscan.

***Example:**

- 1) Sex:
 (1) Female
 (2) Male

Demographics:

- 2) Age:
 (1) 25-30
 (2) 31-35
 (3) 36-40
 (4) 41-45
 (5) 46-50
 (6) 51-55
- 3) Racial or ethnic background:
 (1) White
 (2) Black
 (3) Hispanic
 (4) Asian
 (5) Native American
 (6) Other (please specify: _____)
- 4) Current marital status:
 (1) Single
 (2) Married (how long _____)
 (3) Divorced or separated (how long _____)
 (4) Widowed (how long _____)
 (5) Living with someone

*If you have children, answer questions 5-8. If you do not have children skip to question 9.

- 5) Children:
 (1) Boys (code in exact number) _____
 (Give ages): _____
- 6) Children:
 (1) Girls (code in exact number) _____
 (Give ages): _____

- 7) Where is your youngest child while you work? (Primary place)
- (1) with my spouse
 - (2) with a babysitter
 - (3) day-care
 - (4) preschool
 - (5) school
 - (6) with a relative
 - (7) he/she takes care of him/herself
 - (8) other (specify: _____)
- 8) How satisfactory is the above arrangement to you?
- (1) extremely unsatisfactory
 - (2) somewhat unsatisfactory
 - (3) somewhat satisfactory
 - (4) extremely satisfactory
- 9) If you do not have children, do you plan to have them in the future?
- (1) no
 - (2) yes
 - (3) uncertain
- 10) Years of education:
- (1) attended high school but never graduated
 - (2) graduated from high school
 - (3) attended college but never graduated
 - (4) graduated from college
 - (5) graduated from technical or business school
 - (6) attended graduate school but never graduated
 - (7) received graduate degree (degree and field _____)
- 11) Your (personal) average annual income:
- (1) below \$10,000
 - (2) \$10,000 - 15,000
 - (3) \$15,000 - 20,000
 - (4) \$20,000 - 25,000
 - (5) \$25,000 - 30,000
 - (6) \$30,000 - 35,000
 - (7) \$35,000 - 40,000
 - (8) \$40,000 - 45,000
 - (9) over \$45,000
- 12) Average family income:
- (1) Below \$15,000
 - (2) \$15,000 - 20,000
 - (3) \$20,000 - 25,000
 - (4) \$25,000 - 30,000
 - (5) \$30,000 - 35,000
 - (6) \$35,000 - 40,000
 - (7) \$40,000 - 45,000
 - (8) \$45,000 - 50,000
 - (9) over \$50,000

Work/home

Please answer the following question in the spaces provided below.
Which of the following activities do you participate in at least once per week? Please check those activities which are appropriate, and for each activity checked put how many times a week, on the average, you participate in that activity:

- | | <u>#times/week</u> |
|--|--------------------|
| <u>1)</u> church-related activities | _____ |
| <u>2)</u> after-work activities related to your job | _____ |
| <u>3)</u> activities related to your spouse/partner's job | _____ |
| <u>4)</u> volunteer activities | _____ |
| <u>5)</u> social activities with friends | _____ |
| <u>6)</u> social activities with relatives | _____ |
| <u>7)</u> activities related to your children (PTA, athletics) | _____ |
| <u>8)</u> doing errands for others | _____ |
| <u>9)</u> clubs or other organizations | _____ |
| <u>10)</u> other obligations (specify: _____) | _____ |

Total the above times/per week and darken in the appropriate number on line 13 of the opscan. If total is 10 or above code in 10.

*Your official job title: _____

*Your spouse/partner's official job title: _____

14) You are currently:

- (1) working full-time
(2) working part-time (hours/week _____)
(3) other (specify: _____)

15) Your current position is that of a:

- (1) student
(2) secretary/clerical
(3) manager/supervisor
(4) tenured faculty member
(5) untenured faculty member
(6) administrator
(7) professional/technical
(8) blue collar
(9) other (specify: _____)

16) Years in the workforce:

- (1) not applicable
(2) less than 5
(3) 5 - 10
(4) 11 - 15
(5) 16 - 20
(6) more than 20

- 17) Years spent in present occupation:
- (1) 2 or less
 - (2) 3 - 5
 - (3) 6 - 10
 - (4) 11 - 15
 - (5) 16 - 20
 - (6) more than 20
- 18) How many times have you ever been promoted? Code in exact #.
- 19) How many more years do you expect to work?
- (1) less than 5
 - (2) 5 - 10
 - (3) 11 - 15
 - (4) more than 15
- 20) Average number of hours worked per week at your job:
- (1) less than 40
 - (2) 40
 - (3) 40 - 50
 - (4) 50 - 60
 - (5) more than 60
- 21) How do you feel about the number of hours you work per week?
- (1) work too few
 - (2) work too many
 - (3) satisfied with number of hours
- 22) If you work too many hours what is the major reason for this?
- (1) not applicable
 - (2) I spend my work time inefficiently
 - (3) work load impossible to complete in allotted time
 - (4) cannot work effeciently due to constant interruptions from those around me
 - (5) I enjoy my work and choose to work this amount
 - (6) other (specify: _____)
- 23) What is the first, most important reason why you work?
- (1) to make money
 - (2) to please my spouse/partner
 - (3) to please my parents
 - (4) to advance myself in a field
 - (5) for personal fulfillment
 - (6) other (specify: _____)
- 24) What is the second, most important reason why you work?
- (1) to make money
 - (2) to please my spouse/partner
 - (3) to please my parents
 - (4) to advance myself in a field
 - (5) for personal fulfillment
 - (6) other (specify: _____)

25) How satisfied are you with your present situation?

- (1) extremely unsatisfied
- (2) somewhat unsatisfied
- (3) somewhat satisfied
- (4) extremely satisfied

26) How much influence do you have at work?

- (1) a great deal
- (2) some influence
- (3) very little
- (4) none

Please use the following categories to rate how often each of the following statements describe your job:

- (1) never
- (2) sometimes
- (3) often
- (4) almost always

- 27) The job requires that I work very fast.
- 28) My work requires that I pay very close attention to details.
- 29) My work involves meeting deadlines and/or strict time schedules.
- 30) I can decide how fast or slow to do my work.
- 31) I make decisions on my own, such as how to do my work, in what order, etc.
- 32) I have a lot of pressure or responsibility without enough clout or authority to make decisions.
- 33) I do the same thing over and over; the work is repetitious and monotonous.
- 34) I use my skills and knowledge from my previous experience, training, and/or schooling, in my job.
- 35) I have some say or input into decisions or policies that affect my work.
- 36) My work load is too heavy; I have too much to do.
- 37) I find my work interesting and challenging.
- 38) I am required to complete a certain amount of work per hour or per day.
- 39) I do or decide things when mistakes could be costly.

Please use the above same scale to rate how often the following statements are true about your job.

- 40) I feel lonely or isolated at work.
- 41) The people in my work group get along well together.
- 42) The management treats office employees with respect and dignity.
- 43) There is too much supervision or excessive monitoring of my work.
- 44) My supervisor is angry, hostile, or takes things out on me or my co-workers.
- 45) If you supervise people, how often do you have problems with them?
- 46) There is an effective procedure for handling problems/grievances.
- 47) I have a clear job description which reflects my responsibilities.
- 48) I can count on my co-workers for help or support when I need it.
- 49) When I make a decision, I can count on support from my superiors.

- 50) How many people work around you on a regular basis? Code in exact #.
- 51) Of the people you work around regularly, what percentage are women?
 (1) all women
 (2) 85%
 (3) 50%
 (4) 35%
 (5) 15%
 (6) no other women
- 52) Is your immediate supervisor:
 (1) female
 (2) male
 (3) not applicable
- 53) Do you feel that you are under extra pressure to prove yourself because of your sex?
 (1) yes
 (2) no

Please use the following scale to indicate what effect the following changes had if applicable.

- (1) less stressful
 (2) made no difference
 (3) more stressful
 (4) did not occur
- 54) Reduction in the work force, by staff cuts or by nonreplacement of employees who have left.
- 55) Freeze on salaries, raises, or promotions.
- 56) Introduction of automated equipment or computers.
- 57) Increase in the amount of work required. Speed-up.
- 58) I have been promoted or given more responsibility.
- 59) How much stress do you feel at work as a consequence of your job? Base your answer on a scale from 1 - 10 with 1=minimal stress and 10=extreme stress. Code in the exact number.
- 60) How much stress do you feel at home as a consequence of your job? Base your answer on a scale from 1 - 10 with 1=minimal stress and 10=extreme stress. Code in the exact number.
- 61) What is the major source of stress from your job?
 (1) I have no stresses from my job
 (2) a difficult boss or supervisor
 (3) fellow personnel who are difficult to work with
 (4) work overload
 (5) lack of support
 (6) uncertainty/ambiguity
 (7) job pressure continues after work hours

- 62) What is the second major source of stress from your job?
- (1) I have no stresses from my job
 - (2) a difficult boss or supervisor
 - (3) fellow personnel who are difficult to work with
 - (4) work overload
 - (5) lack of support
 - (6) uncertainty/ambiguity
 - (7) job pressure continues after work hours
- 63) In what way does working interfere with the rest of your life?
Choose one.
- (1) the hours I work are inconvenient in terms of taking care of non-work related activities
 - (2) not enough time to spend with my children
 - (3) not enough time to spend with my spouse/partner
 - (4) not enough time to spend with my friends
 - (5) not enough free time for myself
 - (6) difficult to manage time
 - (7) a lack of support from those around me
 - (8) other (specify: _____)
- 64) What is the major method you currently use to deal with or diminish the stress you feel from work?
- (1) no particular method
 - (2) exercise
 - (3) hobbies
 - (4) art/music
 - (5) other people
 - (6) food
 - (7) alcohol
 - (8) medications
 - (9) work harder
 - (10) other (specify: _____)
- 65) How successful is the above method in reducing your work-related stress?
- (1) not applicable
 - (2) extremely unsuccessful
 - (3) somewhat unsuccessful
 - (4) somewhat successful
 - (5) extremely successful
- 66) How flexible are your current working hours?
- (1) extremely inflexible
 - (2) somewhat inflexible
 - (3) somewhat flexible
 - (4) extremely flexible
- 67) Would you prefer your hours to be:
- (1) more flexible
 - (2) less flexible
 - (3) the same

- 68) Do you currently:
 (1) receive no salary
 (2) make more money than your spouse/partner
 (3) make about the same as your spouse/partner
 (4) make less than your spouse/partner
 (5) not applicable
- 69) Is the above arrangement satisfactory to you?
 (1) not applicable
 (2) yes
 (3) no
- 70) Is the above arrangement satisfactory to your spouse/partner?
 (1) not applicable
 (2) yes
 (3) no
- 71) How happy or satisfied is your spouse/partner with the fact that you are working?
 (1) not applicable
 (2) extremely opposed
 (3) somewhat opposed
 (4) tolerant
 (5) somewhat supportive
 (6) extremely supportive

If your spouse/partner works answer 72 and 73. If not, go on to 74.

- 72) What do you find to be the greatest stressor or difficulty arising from the fact that both you and your spouse/partner work?
 (1) insufficient time to spend with each other
 (2) insufficient time to spend with the children
 (3) being responsible for majority of the household duties and/or child care duties myself
 (4) insufficient time for friends or relatives
 (5) insufficient time for myself
 (6) insufficient support from others
 (7) other (specify: _____)
- 73) What is the greatest asset stemming from the fact that both of you work?
 (1) more money
 (2) ability to share similar experiences and understand each other's perspectives better
 (3) being exposed to a wider variety of social contacts
 (4) other (specify: _____)
- 74) What is the area around which the majority of conflicts between you and your spouse/partner arise?
 (1) not applicable
 (2) career/work/school
 (3) money issue
 (4) issues of time management
 (5) household duties/children

- 74) cont.
 (6) leisure/entertainment
 (7) sexual relations
 (8) communication
 (9) drinking
 (10) other (specify: _____)
- 75) Identify the second major area around which conflicts between you and your spouse/partner arise:
 (1) not applicable
 (2) career/work/school
 (3) money issues
 (4) issues of time management
 (5) household duties/children
 (6) leisure/entertainment
 (7) sexual relations
 (8) communication
 (9) drinking
 (10) other (specify: _____)
- 76) Everything considered, how happy would you say your relationship with your spouse/partner has been?
 (1) very happy
 (2) happy
 (3) average
 (4) unhappy
 (5) very unhappy
- 77) Everything considered, how happy would you say that your spouse/partner has found your relationship to be:
 (1) very happy
 (2) happy
 (3) average
 (4) unhappy
 (5) very unhappy
- 78) How many hours in an average week do you spend on housework?
 Code in exact number. (Code in 10 for 10 or more hours)
- 79) How many hours per average week do you spend taking care of your children? Code in exact number (Code in 10 for 10 or more hours)
- 80) Are you the sole support of your household?
 (1) yes
 (2) no

Anger/Hostility:

The items in this section describe a variety of anger-related symptoms. Use the following scale to answer how well these characteristics describe your reactions.

very likely	somewhat likely	not too likely
1	2	3

When really angry or annoyed I:

- 81) get tense or worried
- 82) get a headache
- 83) feel weak
- 84) feel depressed
- 85) get nervous or shakey

When really angry or annoyed I:

- 86) try to act as though nothing much happened
- 87) keep it to myself
- 88) apologize even though I am right

When really angry or annoyed I:

- 89) take it out on others
- 90) blame someone else

Use the following scale to answer the questions below:

never	sometimes	often	almost always
1	2	3	4

When you are angry, frustrated, or anxious, how often are you likely to:

- 91) Exercise, walk, jog, dance, or meditate
- 92) Engage in a hobby
- 93) Drink alcohol
- 94) Smoke cigarettes
- 95) Use drugs or take medicine
- 96) Drink more coffee or soda
- 97) Eat more often
- 98) Take time to get away from it all
- 99) Talk to a friend or relative as soon as possible
- 100) Get it off your chest, blow off steam
- 101) Take action to prevent the same situation from happening again
- 102) In the past month, how often were you under stress, strain, or pressure?

Support:

Boss (the person directly above you):

- 103) is a person you can completely trust
 - (1) yes
 - (2) no
- 104) is cooperative
 - (1) yes
 - (2) no

- 105) is a person you can rely on to carry his/her load
 (1) yes
 (2) no
- 106) is a person who appreciates you
 (1) yes
 (2) no
- 107) is a person who interferes with you or makes it difficult to get your work done
 (1) yes
 (2) no
- 108) is a person who generally lets you know how you stand
 (1) yes
 (2) no
- 109) is a person who takes a personal interest in you
 (1) yes
 (2) no

Please rate each statement and the items that follow using the following scale:

not at all	a little	somewhat	very much
1	2	3	4

How much does each of these people go out of their way to do things to make your work life easier for you?

- 110) your immediate supervisor (boss)
 111) other people at work
 112) your spouse/partner
 113) friends and/or relatives

How much can each of these people be relied on when things get tough at work?

- 114) your immediate supervisor (boss)
 115) other people at work
 116) your spouse/partner
 117) friends and/or relatives

How much can these people be relied on when things get tough at home?

- 118) your immediate supervisor (boss)
 119) other people at work
 120) your spouse/partner
 121) friends and/or relatives

How much is each of the following people willing to listen to your personal problems?

- 122) your immediate supervisor (boss)
 123) other people at work
 124) your spouse/partner
 125) friends and/or relatives

Please rate each statement and the items that follow using the following scale:

not at all easy	a little easy	somewhat easy	very easy
1	2	3	4

How easy is it to talk with each of the following people?

- 126) your immediate supervisor (boss)
- 127) other people at work
- 128) your spouse/partner
- 129) friends and/or relatives

During the last two working days, how many times have you sought out a coworker about:

- 130) personal problems
 - (1) none
 - (2) once or twice
 - (3) three times
 - (4) four times
 - (5) more than four times
- 131) work-related problems
 - (1) none
 - (2) once or twice
 - (3) three times
 - (4) more than four times
- 132) Do you feel that you have at least one person with whom you can discuss personal problems?
 - (1) no
 - (2) yes
 - (3) uncertain

Health:

Please use the scale below to rate the following items:

- (1) never or rarely/0-2x per month
- (2) sometimes/3-4x per month
- (3) often/2-3x per week
- (4) every day

How often do you experience each of these health problems or symptoms?

- 133) Eyestrain or sore eyes
- 134) Headaches
- 135) Frequent colds or sore throats
- 136) Nausea or dizziness
- 137) Trouble sleeping
- 138) Muscle strain or pain in your neck, back, arms, or shoulders
- 139) Exhaustion or severe fatigue at day's end
- 140) Stomach pains or digestive problems; heartburn
- 141) Skin rashes/irritation from chemicals
- 142) Difficulty breathing, shortness of breath, or excessive coughing
- 143) Tightness or pressure in your chest
- 144) Tension, anxiety, "nerves"
- 145) Periods of irritability or anger
- 146) Loss of your sexual drive
- 147) Depression
- 148) Other (specify: _____)

Within the past five years, have you been told by a doctor that you have, or have been treated for, any of the following? (Please answer all that apply.)

1=yes 2=no

- 149) high blood pressure
- 150) gastritis, "nervous stomach"
- 151) psychological problems
- 152) vision problems
- 153) heart disease
- 154) ulcer
- 155) colitis, inflamed colon, or spastic colon
- 156) cataracts

157) In the past year, have any of the problems above caused you to lose time from work?

- (1) yes
- (2) no

158) In the past year, how often did you keep working when you were sick? (Code in exact number of days.)

159) Do you smoke?

- (1) yes
- (2) no

160) Do you smoke at work, for example at your desk?

- (1) yes
- (2) no

next page

As you know, a program for women dealing with work-related stress and health-related issues is being offered through the Department of Psychology (Psychological Services Center) at Va. Tech. This program will include both a Roanoke-based group and a Blacksburg-based group. The program is offered free of charge. The groups will meet for a total of 12 90min. sessions. Please complete the following questions--your input is very valuable as we finalize this program. Answer directly on this sheet.

1. How many meetings per week would you be willing to attend?
 (1) one
 (2) two

2. What time would be the best for you in scheduling such programs?
 Choose one.
 (1) after work (time: _____)
 (2) evenings (time: _____)
 (3) weekends (time: _____)
 (4) other (specify: _____)

3. What is the next most convenient time for you in scheduling such a program? Choose one.
 (1) after work (time: _____)
 (2) evenings (time: _____)
 (3) weekends (time: _____)
 (4) other (specify: _____)

4. What conflicts or difficulties would keep you from attending such a program?
 (1) transportation difficulties
 (2) scheduling difficulties
 (3) problems with child care
 (4) spouse/partner would object
 (5) no difficulties in attending
 (6) other (specify: _____)

5. I feel that an educational/supportive program for women on the following areas would be useful. Check those areas in which you are interested.
 (1) increasing support systems
 (2) time-management
 (3) work-related stress and women
 (4) stress and health issues
 (5) anger control and coping
 (6) tension reduction techniques
 (7) other (specify: _____)

Thank-you for your cooperation in completing this questionnaire. You will be contacted soon as to the date of the first assessment session. If you would like any additional information please contact the Psychological Services Center (in Blacksburg) at 961-6914.

Sincerely,

Debra A. Weaver

Confidential—for Professional Use Only

HEALTH INFORMATION FORM

Code #: _____

Age: _____

Height: _____

Weight: _____

Blood Pressure: _____ (To be taken at assessment session.)

- 1) Have you smoked within the last 7 days? ☐ yes ☐ no
 cigarettes per day _____ Brand _____

- 2) Have you consumed alcohol within the last 7 days? ☐ yes ☐ no
 If so, please specify.

Amount per week

<input type="checkbox"/> Beer	<input type="checkbox"/> cans/bottles
<input type="checkbox"/> Wine	<input type="checkbox"/> glasses
<input type="checkbox"/> Liquor	<input type="checkbox"/> drinks

- 3) Have you consumed any beverages containing caffeine within the last 7 days?
☐ yes ☐ no
 If so, please specify.

Amount per day

<input type="checkbox"/> Coffee	<input type="checkbox"/> cups
<input type="checkbox"/> Tea	<input type="checkbox"/> cups/glasses
<input type="checkbox"/> Cola drinks	<input type="checkbox"/> glasses/cans

- 4) Did you exercise within the last 7 days? ☐ yes ☐ no
 If so, in what manner.

Hours per week

<input type="checkbox"/> jogging	_____
<input type="checkbox"/> walking	_____
<input type="checkbox"/> calisthenics (include exercycle)	_____
<input type="checkbox"/> racketball	_____
<input type="checkbox"/> tennis	_____
<input type="checkbox"/> golf	_____
<input type="checkbox"/> swimming	_____
<input type="checkbox"/> dancing	_____
<input type="checkbox"/> martial arts	_____
<input type="checkbox"/> yoga	_____
<input type="checkbox"/> weight training	_____
<input type="checkbox"/> horseback riding	_____
<input type="checkbox"/> cycling	_____
<input type="checkbox"/> other (specify: _____)	_____

- 5) Have you taken any medications within the last 7 days? ☐ yes ☐ no
 If so, please specify.

Amount per week

<input type="checkbox"/> aspirin	_____
<input type="checkbox"/> antacids	_____
<input type="checkbox"/> prescription medications (specify _____)	_____
<input type="checkbox"/> vitamins (specify _____)	_____
<input type="checkbox"/> birth control pills	_____
<input type="checkbox"/> other (specify _____)	_____

- 6) Have you taken time out to relax within the last 7 days? ☐ yes ☐ no
If so, please specify.

Times per week

<input type="checkbox"/> took a nap	_____
<input type="checkbox"/> sat quietly	_____
<input type="checkbox"/> read (for enjoyment)	_____
<input type="checkbox"/> watched T.V.	_____
<input type="checkbox"/> listened to music	_____
<input type="checkbox"/> engaged in a hobby	_____
<input type="checkbox"/> did relaxation/meditation exercises	_____
<input type="checkbox"/> other (specify _____)	_____

- 7) Do you have a history of any of the following? ☐ yes ☐ no
If so, please specify.

☐ heart disease (includes angina, arrhythmias, etc.)
☐ hypertension (high blood pressure)
☐ stroke

- 8) Please indicate any long term (chronic) illnesses you have. (Such as: epilepsy, diabetes, etc.)

- 9) Have you undergone, or are you currently undergoing, menopause?

☐ yes
☐ no

WORKING WOMEN AND STRESS

Informed Consent Form

Purpose of this project:

The purpose of this project are two-fold: 1) to study the relationship between job-related stress and health in women; and 2) to provide a sample of the participants techniques to deal with job-related stresses with the purpose of reducing the chances of acquiring stress-related illnesses including coronary heart disease.

If you agree to participate in this program you will be involved in at least two 90 min. assessment sessions which will involve your completing several questionnaires and a small blood sample which will be taken by medical personnel (a RN or medical technologist). In addition, you will have a 25% chance of being selected to participate in the treatment phase of the project which will involve one additional assessment session along with 12 group meetings.

Procedures and measures:

It is understood that participation in the Working Women and Stress Project will require several commitments.

- 1) Participation from everyone will be required in the initial assessment session. This session will take approximately 2 hours and will involve completing several questionnaires. Also at this time a small blood sample will be taken.
- 2) Participation from everyone will also be required in a second such assessment session which will take place at the conclusion of the treatment phase (approximately 4 months later). These sessions are critical in the evaluation of the stress reduction techniques.

At the beginning of this project each participant will have approximately a 25% chance of being selected for participation in the treatment phase of the project. If selected for this phase, participants will be requested to attend 12, 90 minutes, group sessions. In addition to the two assessment sessions mentioned above, those chosen for this phase will be asked to participate in one additional assessment session. This additional session will take place approximately 6 months after the completion of the treatment phase of the project.

Confidentiality:

All forms and information on participants will be kept confidential. To insure this, each participant will be given a code number which will be used on all forms instead of her name. The project director will have a list of names and code numbers in order to facilitate collection of forms. However, individual participants's names will never be associated with any written or oral presentation of this project.

The project director will audiotape a sample of the group treatment session. This is for the benefit of the project director (Debra Weaver) and the project supervisor (Dr. Lee Frederiksen) to ensure that the sessions are presented in the manner in which they are intended. These tapes will be kept strictly confidential and will be erased at the end of the project.

Responsibilities, benefits, and risks:

Participants responsibilities will include: 1) completing all forms, and participating in two assessment sessions, or if selected for the treatment phase a third assessment session; 2) coming to all group treatment sessions (if selected for phase two); and 3) trying out things discussed during the group sessions, although participants are under no obligation to try everything. Participants should be willing to do all parts of the project even though only 25% will be involved in phase two (treatment).

Your participation in this project is completely voluntary and may be discontinued at any time without any type of penalty.

By participating in this study you will be making a contribution to the further understanding of the stress-illness relationship in women. It is anticipated that by attending and participating in group sessions the participant will learn certain techniques by which to modify maladaptive behavioral styles that can lead to a variety of stress-related illnesses including coronary heart disease. While these benefits are anticipated, they cannot be guaranteed.

As a participant in this project, any questions will be answered as accurately as possible by either the project director (Debra Weaver 703/362-2711 or 703/961-6914) or the project supervisor (Dr. Lea Frederiksen 703/961-6914).

I have read the above description of this project and understand my rights and responsibilities as a participant.

Participant's Name: _____ Date: _____

Participant's Signature _____ Date: _____

Witness' Name: _____ Date: _____

Participant's Home Phone Number: _____

APPENDIX B

1. Jenkins Activity Survey
2. Framingham Type A Scale
3. Novaco Anger Inventory
4. Perceived Work Environment
5. Bem Sex Role Inventory

Jenkins Activity Survey

C. David Jenkins, Ph.D. Stephen J. Zyzanetski, Ph.D. Ray H. Rosenman, M.D.

FORM C

[illegible]

Age	

Male ☐
Female ☐

The *Jenkins Activity Survey* asks questions about aspects of behavior that have been found helpful in medical diagnosis. Each person is different, so there are no "right" or "wrong" answers.

For each question, choose the answer that is true for you, and fill in the space in front of that answer. Use a

black lead pencil, and make your marks heavy and dark. Mark only one answer for each question. If you change your mind, erase the old mark completely.

Do not make any stray marks.

1. Do you ever have trouble finding time to get your hair cut or styled?

☐ A○ Never
☐ B○ Occasionally
☐ C○ Almost always

- 2. How often does your job "stir you into action"?**

☐ A Less often than most people's jobs
☐ B About average
☐ C More than most people's jobs

3. Is your everyday life filled mostly by

- ☐ A problems needing a solution?
- ☐ B challenges needing to be met?
- ☐ C a rather predictable routine of events?
- ☐ D not enough things to keep me interested or busy?

4. Some people live a calm, predictable life. Others often find themselves facing unexpected changes, frequent interruptions, inconveniences, or "things going wrong." How often are you faced with these minor (or major) annoyances or frustrations?

☐ Several times a day
☐ About once a day
☐ A few times a week
☐ Once a week
☐ Once a month or less

5. When you are under pressure or stress, what do you usually do?

- ☐ A○ Do something about it immediately
- ☐ B○ Plan carefully before taking any action

6. Ordinarily, how rapidly do you eat?

- ☐ A I'm usually the first one finished.
- ☐ B I eat a little faster than average.
- ☐ C I eat at about the same speed as most people.
- ☐ D I eat more slowly than most people.

7. Has your spouse or a friend ever told you that you eat too fast?

A ☐ Yes, often
B ☐ Yes, once or twice
C ☐ No, never

8. How often do you find yourself doing more than one thing at a time, such as working while eating, reading while dressing, or figuring out problems while driving?

☐ A I do two things at once whenever practical.
☐ B I do this only when I'm short of time.
☐ C I rarely or never do more than one thing at a time.

9. When you listen to someone talking, and this person takes too long to come to the point, how often do you feel like hurrying the person along?

☐ A○ Frequently
☐ B○ Occasionally
☐ C○ Almost never

10. How often do you actually "put words in the person's mouth" in order to speed things up?

☐ A○ Frequently
☐ B○ Occasionally
☐ C○ Almost never

11. If you tell your spouse or a friend that you will meet somewhere at a definite time, how often do you arrive late?
 - ☐ A Once in a while
 - ☐ B Rarely
 - ☐ C I am never late.
12. How often do you find yourself hurrying to get places even when there is plenty of time?
 - ☐ A Frequently
 - ☐ B Occasionally
 - ☐ C Almost never
13. Suppose you are to meet someone at a public place (street corner, building lobby, restaurant) and the other person is already 10 minutes late. What will you do?
 - ☐ A Sit and wait
 - ☐ B Walk about while waiting
 - ☐ C Usually carry some reading matter or writing paper so I can get something done while waiting
14. When you have to "wait in line" at a restaurant, a store, or the post office, what do you do?
 - ☐ A Accept it calmly
 - ☐ B Feel impatient but not show it
 - ☐ C Feel so impatient that someone watching can tell I am restless
 - ☐ D Refuse to wait in line, and find ways to avoid such delays
15. When you play games with young children about 10 years old (or when you did so in past years), how often do you purposely let them win?
 - ☐ A Most of the time
 - ☐ B Half the time
 - ☐ C Only occasionally
 - ☐ D Never
16. When you were younger, did most people consider you to be
 - ☐ A definitely hard-driving and competitive?
 - ☐ B probably hard-driving and competitive?
 - ☐ C probably more relaxed and easygoing?
 - ☐ D definitely more relaxed and easygoing?
17. Nowadays, do you consider yourself to be
 - ☐ A definitely hard-driving and competitive?
 - ☐ B probably hard-driving and competitive?
 - ☐ C probably more relaxed and easygoing?
 - ☐ D definitely more relaxed and easygoing?
18. Would your spouse (or closest friend) rate you as
 - ☐ A definitely hard-driving and competitive?
 - ☐ B probably hard-driving and competitive?
 - ☐ C probably relaxed and easygoing?
 - ☐ D definitely relaxed and easygoing?
19. Would your spouse (or closest friend) rate your general level of activity as
 - ☐ A too slow—should be more active?
 - ☐ B about average—busy much of the time?
 - ☐ C too active—should slow down?
20. Would people you know well agree that you take your work too seriously?
 - ☐ A Definitely yes
 - ☐ B Probably yes
 - ☐ C Probably no
 - ☐ D Definitely no
21. Would people you know well agree that you have less energy than most people?
 - ☐ A Definitely yes
 - ☐ B Probably yes
 - ☐ C Probably no
 - ☐ D Definitely no
22. Would people you know well agree that you tend to get irritated easily?
 - ☐ A Definitely yes
 - ☐ B Probably yes
 - ☐ C Probably no
 - ☐ D Definitely no
23. Would people who know you well agree that you tend to do most things in a hurry?
 - ☐ A Definitely yes
 - ☐ B Probably yes
 - ☐ C Probably no
 - ☐ D Definitely no
24. Would people who know you well agree that you enjoy a "contest" (competition) and try hard to win?
 - ☐ A Definitely yes
 - ☐ B Probably yes
 - ☐ C Probably no
 - ☐ D Definitely no
25. How was your temper when you were younger?
 - ☐ A Fiery and hard to control
 - ☐ B Strong but controllable
 - ☐ C No problem
 - ☐ D I almost never got angry.
26. How is your temper nowadays?
 - ☐ A Fiery and hard to control
 - ☐ B Strong but controllable
 - ☐ C No problem
 - ☐ D I almost never get angry.

27. When you are in the midst of doing a job and someone (not your boss) interrupts you, how do you usually feel inside?
- ☐ A○ I feel O.K. because I work better after an occasional break.
 - ☐ B○ I feel only mildly annoyed.
 - ☐ C○ I really feel irritated because most such interruptions are unnecessary.
28. How often are there deadlines on your job?
- ☐ A○ Daily or more often
 - ☐ B○ Weekly
 - ☐ C○ Monthly or less often
 - ☐ D○ Never
29. These deadlines usually carry
- ☐ A○ minor pressure because of their routine nature.
 - ☐ B○ considerable pressure, since delay would upset my entire work group.
 - ☐ C○ Deadlines never occur on my job.
30. Do you ever set deadlines or quotas for yourself at work or at home?
- ☐ A○ No
 - ☐ B○ Yes, but only occasionally
 - ☐ C○ Yes, once a week or more
31. When you have to work against a deadline, what is the quality of your work?
- ☐ A○ Better
 - ☐ B○ Worse
 - ☐ C○ The same (Pressure makes no difference.)
32. At work, do you ever keep two jobs moving forward at the same time by shifting back and forth rapidly from one to the other?
- ☐ A○ No, never
 - ☐ B○ Yes, but only in emergencies
 - ☐ C○ Yes, regularly
33. Are you content to remain at your present job level for the next five years?
- ☐ A○ Yes
 - ☐ B○ No, I want to advance.
 - ☐ C○ Definitely no; I strive to advance and would be dissatisfied if not promoted in that length of time.
34. If you had your choice, which would you rather get?
- ☐ A○ A small increase in pay without a promotion to a higher level job
 - ☐ B○ A promotion to a higher level job without an increase in pay
35. In the past three years, have you ever taken less than your allotted number of vacation days?
- ☐ A○ Yes
 - ☐ B○ No
 - ☐ C○ My type of job does not provide regular vacations.
36. In the last three years, how has your personal yearly income changed?
- ☐ A○ It has remained the same or gone down.
 - ☐ B○ It has gone up slightly (as the result of cost-of-living increases or automatic raises based on years of service).
 - ☐ C○ It has gone up considerably.
37. How often do you bring your work home with you at night, or study materials related to your job?
- ☐ A○ Rarely or never
 - ☐ B○ Once a week or less
 - ☐ C○ More than once a week
38. How often do you go to your place of work when you are not expected to be there (such as nights or weekends)?
- ☐ A○ It is not possible on my job.
 - ☐ B○ Rarely or never
 - ☐ C○ Occasionally (less than once a week)
 - ☐ D○ Once a week or more
39. When you find yourself getting tired on the job, what do you usually do?
- ☐ A○ Slow down for a while until my strength comes back
 - ☐ B○ Keep pushing myself at the same pace in spite of the tiredness
40. When you are in a group, how often do the other people look to you for leadership?
- ☐ A○ Rarely
 - ☐ B○ About as often as they look to others
 - ☐ C○ More often than they look to others
41. How often do you make yourself written lists to help you remember what needs to be done?
- ☐ A○ Never
 - ☐ B○ Occasionally
 - ☐ C○ Frequently
- For questions 42-46, compare yourself with the average worker in your present occupation, and mark the most accurate description.
42. In amount of effort put forth, I give
- ☐ A○ much more effort.
 - ☐ B○ a little more effort.
 - ☐ C○ a little less effort.
 - ☐ D○ much less effort.

43. In sense of responsibility, I am

- ☐ much more responsible.
- ☐ a little more responsible.
- ☐ a little less responsible.
- ☐ much less responsible.

44. I find it necessary to hurry

- ☐ much more of the time.
- ☐ a little more of the time.
- ☐ a little less of the time.
- ☐ much less of the time.

45. In being precise (careful about detail), I am

- ☐ much more precise.
- ☐ a little more precise.
- ☐ a little less precise.
- ☐ much less precise.

46. I approach life in general

- ☐ much more seriously.
- ☐ a little more seriously.
- ☐ a little less seriously.
- ☐ much less seriously.

For questions 47-49, compare your present work with your work setting of five years ago. If you have not been working for five years, compare your present job with your first job.

47. I worked more hours per week

- ☐ at my present job.
- ☐ five years ago.
- ☐ Cannot decide

48. I carried more responsibility

- ☐ at my present job.
- ☐ five years ago.
- ☐ Cannot decide

49. I was considered to be at a higher level (in prestige or social position)

- ☐ at my present job.
- ☐ five years ago.
- ☐ Cannot decide

50. How many different job titles have you held in the last 10 years? (Be sure to count shifts in kinds of work, shifts to new employers, and shifts up and down within a firm.)

- ☐ 0-1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5 or more

51. How much schooling did you receive?

- ☐ 0-4 years
- ☐ 5-8 years
- ☐ Some high school
- ☐ Graduated from high school
- ☐ Trade school or business college
- ☐ Some college (including junior college)
- ☐ Graduated from a four-year college
- ☐ Post-graduate work at a college or university

52. When you were in school, were you an officer of any group, such as a student council, glee club, 4-H club, sorority or fraternity, or captain of an athletic team?

- ☐ No
- ☐ Yes, I held one such position.
- ☐ Yes, I held two or more such positions.

Framingham Scale

Code #: _____

Date: _____

Please use the opscan sheet to answer the following questions.

OPSCAN INSTRUCTIONS:

1. Mark your code number in the last three places under identification number.
2. Make all marks dark and completely fill the circle.
3. Make any erasures complete
4. Use a number 2 pencil

Use the following scale to answer 1-5:

- 1 - very well
- 2 - fairly well
- 3 - somewhat
- 4 - not at all

Traits and qualities which describe you

- 1) Being hard-driving and competitive
- 2) Usually pressed for time
- 3) Being bossy and dominating
- 4) Having a strong need to excel in most things
- 5) Eating too quickly

Use the following scale to answer 6-10:

- 1 -yes
- 2 -no

Feeling at end of an average work day

- 6) Often felt very pressed for time
- 7) Worked stayed with you so you were thinking about it after working hours
- 8) Work often stretched you to the very limits of your energy and capacity
- 9) Often felt uncertain, uncomfortable, or dissatisfied with how well you were doing
- 10) Do you get upset when you have to wait for anything?

NOVACO PROVOCATION INVENTORY

Instructions

The items on the scale describe situations that are related to anger arousal. For each of the items, please rate the degree to which the incident described by the item would anger or provoke you by using the following scale:

1	2	3	4	5
very little	little	a moderate amount	much	very much

Use the same scale for each of the items. Please mark your responses on the answer sheet provided. Try to imagine the incident actually happening to you, and then indicate the extent to which it would have made you angry by scoring the answer sheet.

In the actual situations, the degree of anger that you would experience certainly would depend on other factors that are not specified in the items (such as, what kind of day you were having, exactly who was involved in the situation, how the act occurred, etc.). This scale is concerned with your general reactions, and so the details of particular situations have been omitted. Please do your best to rate your responses in this general fashion.

1. You are waiting to be served at a restaurant. Fifteen minutes have gone by, and you still haven't even received a glass of water.
2. Being overcharged by a repairman who has you over a barrel.
3. Being singled out for correction, when the actions of others go unnoticed.
4. You are trying to rest or read, but there are children nearby who are making a lot of noise while playing.
5. Being called a liar.
6. You are in the midst of a dispute, and the other person calls you a "stupid jerk."
7. Hearing that a person has been deprived of his/her constitutional rights.
8. Someone borrows your car, consumes 1/3 of a tank of gas, and doesn't replace it or compensate you for it.
9. People who think that they are always right.
10. You unpack an appliance that you have just bought, plug it in, and discover that it doesn't work.
11. Struggling to carry four cups of coffee to your table at a cafeteria, someone bumps into you, spilling the coffee.
12. Getting your car stuck in the mud or snow.
13. You are typing a report hurrying to make a deadline, and the typewriter jams.
14. Employers who take advantage of their employees' need for work by demanding more than they have a right to.
15. Watching someone bully another person who is physically smaller than he is.
16. Persons in authority who refuse to listen to your point of view.
17. You have hung up your clothes, but someone knocks them to the floor and fails to pick them up.
18. Being stood-up for a date.
19. Noise and disorder at the dinner table.
20. You are driving to pick up a friend at the airport and are forced to wait for a long freight train.

21. You are driving along at 45 mph, and the guy behind you is right on you bumper.
22. You are talking to someone, and they don't answer you.
23. Hitting your finger with a hammer.
24. Newspapers slanting the news against persons in political office to make them look bad to the public.
25. You have made arrangements to go somewhere with a person, who backs off at the last minute and leaves you hanging.
26. Being joked about or teased.
27. Your car is stalled at a traffic light, and the guy behind you keeps blowing his horn.
28. Seeing somebody berate another person to excess.
29. Being pushed or shoved by someone in an argument.
30. You accidentally make the wrong kind of turn in a parking lot. As you get out of your car someone yells at you, "Where did you learn to drive?"
31. Someone who pretends to be something that they are not.
32. You walk out to the parking lot, and you discover that your car has been towed away by the police.
33. Working hard on a project and getting a poor evaluation.
34. Someone makes a mistake and blames it on you.
35. You get in your car to drive to work, and the car won't start.
36. Being hounded by a salesperson from the moment that you walk into a store.
37. Being given an unnecessarily difficult exam when you need a good grade.
38. You are deprived of a promotion to which you are entitled because you haven't played up to the right people.
39. Someone who tries to make you feel guilty.
40. You are trying to concentrate, but a person near you is tapping their foot.

41. Getting punched in the mouth.
42. When you are criticized in front of others for something that you have done.
43. You lend someone an important book or tool, and they fail to return it.
44. In the parking lot, the person whose car is next to yours swings open his door, chipping the paint from your car.
45. Getting cold soup or vegetables in a restaurant.
46. Someone who is always trying to get "one-up" on you.
47. You have had a busy day, and the person you live with starts to complain about how you forgot to do something that you agreed to do.
48. People who constantly brag about themselves.
49. Being thrown into a swimming pool with your clothes on.
50. Banging your shins against a piece of furniture.
51. You are trying to discuss something important with your mate or partner who isn't giving you a chance to express your feelings.
52. Being forced to do something that you don't want to do.
53. You are in a discussion with someone who persists in arguing about a topic they know very little about.
54. Losing a game that you wanted to win.
55. Being told to "go to hell."
56. Someone making fun of the clothes that you are wearing.
57. Someone sticking their nose into an argument between you and someone else.
58. You are walking along on a rainy day, and a car drives past, splashing you with water from the street.
59. Acts of prejudice against a minority or ethnic group.
60. Someone spits at you.

61. You need to get somewhere quickly, but the car in front of you is going 25 mph in a 40 mph zone, and you can't pass.
62. Being talked about behind your back.
63. Stepping on a gob of chewing gum.
64. Hearing that a very wealthy person has paid zero income tax.
65. You have just cleaned up an area and organized the things in it, but someone comes along and messes it up.
66. Someone ripping off your automobile antenna.
67. You are involved in watching a TV program, and someone comes up and switches the channel.
68. Being told by an employer or teacher that you have done poor work.
69. You are in a ball game, and one of your opponents is unnecessarily rough.
70. Being mocked by a small group of people as you pass them.
71. Acts of economic exploitation whereby people in business make excessive profits by taking advantage of need and demand.
72. You are in a theater ticket line, and someone cuts in front of you.
73. Being forced to do something in a way that someone else thinks that it should be done.
74. You use your last 10¢ to make a phone call, but you are disconnected before you finish dialing.
75. In a hurry to get somewhere, you tear a good pair of slacks on a sharp object.
76. Being misled and deceived by someone holding political office.
77. You are out for an evening with someone who indirectly conveys to you that you just don't measure up to their standards.
78. While washing your favorite cup, you drop it, and it breaks.
79. Children leaving their toys and play items scattered about the house on the floor and furniture.
80. Discovering that you were deliberately sold defective merchandise.

DESCRIPTION OF YOUR WORK ENVIRONMENT

In this part of the questionnaire we would like you to describe the environment in which you work. By combining your description with that of other employees, we hope to get an idea of how employees see their work environment.

By "work environment" we mean: the physical working conditions, the other employees with whom you work, the company's standard operating procedures, etc.

Please indicate the degree to which each statement describes your work environment as you experience and see it. Do this by writing the appropriate number (based on the scale below) in the blank to the left of each statement.

Make your descriptions as objectively and factually accurate as possible, without regard for whether you like or dislike your job.

	1	2	3	4	5
	Never True	Almost Never True	Sometimes True	Almost Always True	Always True
_____	1.	The arrangement of people and equipment is appropriate for the task.			
_____	2.	Pay increases are related to performance.			
_____	3.	Employees receive sufficient training.			
_____	4.	There is serious conflict among the employees.			
_____	5.	The supervisor is flexible when necessary.			
_____	6.	There is the opportunity to take part in deciding what the work methods, procedures, and goals will be.			
_____	7.	There is almost a continuous series of deadlines and tight schedules.			
_____	8.	There are high performance standards.			
_____	9.	Important decisions are made by the employees closest to the situation.			
_____	10.	Employees trust one another and offer support to one another.			
_____	11.	Employees try hard to get ahead.			
_____	12.	Most employees take part in making the decisions that affect their unit.			
_____	13.	The equipment is up-to-date.			
_____	14.	Employees get along well with each other and enjoy their work.			

[illegible]

PLEASE CHECK TO MAKE SURE
YOU HAVE NOT MISSED ANY ITEMS

Instructions: Please rate the following characteristics, as they describe you, using the scale below—

	<u>1</u>	2	3	4	5	6	<u>7</u>
	(NEVER OR ALMOST NEVER TRUE)						(ALWAYS OR ALMOST ALWAYS TRUE)
(1) Self-reliant				1	2	3	4 5 6 7
(2) Yielding				1	2	3	4 5 6 7
(3) Helpful				1	2	3	4 5 6 7
(4) Defends own beliefs				1	2	3	4 5 6 7
(5) Cheerful				1	2	3	4 5 6 7
(6) Moody				1	2	3	4 5 6 7
(7) Independent				1	2	3	4 5 6 7
(8) Shy				1	2	3	4 5 6 7
(9) Conscientious				1	2	3	4 5 6 7
(10) Athletic				1	2	3	4 5 6 7
(11) Affectionate				1	2	3	4 5 6 7
(12) Theatrical				1	2	3	4 5 6 7
(13) Assertive				1	2	3	4 5 6 7
(14) Flatterable				1	2	3	4 5 6 7
(15) Happy				1	2	3	4 5 6 7
(16) Strong Personality				1	2	3	4 5 6 7
(17) Loyal				1	2	3	4 5 6 7
(18) Unpredictable				1	2	3	4 5 6 7
(19) Forceful				1	2	3	4 5 6 7
(20) Feminine				1	2	3	4 5 6 7
(21) Reliable				1	2	3	4 5 6 7
(22) Analytical				1	2	3	4 5 6 7
(23) Sympathetic				1	2	3	4 5 6 7
(24) Jealous				1	2	3	4 5 6 7
(25) Has leadership abilities				1	2	3	4 5 6 7
(26) Sensitive to the needs of others				1	2	3	4 5 6 7
(27) Truthful				1	2	3	4 5 6 7
(28) Willing to take risks				1	2	3	4 5 6 7
(29) Understanding				1	2	3	4 5 6 7
(30) Secretive				1	2	3	4 5 6 7

(31) Makes decisions easily	1	2	3	4	5	6	7
(32) Compassionate	1	2	3	4	5	6	7
(33) Sincere	1	2	3	4	5	6	7
(34) Self-sufficient	1	2	3	4	5	6	7
(35) Eager to soothe hurt feelings	1	2	3	4	5	6	7
(36) Conceited	1	2	3	4	5	6	7
(37) Dominant	1	2	3	4	5	6	7
(38) Soft spoken	1	2	3	4	5	6	7
(39) Likable	1	2	3	4	5	6	7
(40) Masculine	1	2	3	4	5	6	7
(41) Warm	1	2	3	4	5	6	7
(42) Solemn	1	2	3	4	5	6	7
(43) Willing to take a stand	1	2	3	4	5	6	7
(44) Tender	1	2	3	4	5	6	7
(45) Friendly	1	2	3	4	5	6	7
(46) Aggressive	1	2	3	4	5	6	7
(47) Gullible	1	2	3	4	5	6	7
(48) Inefficient	1	2	3	4	5	6	7
(49) Acts as a leader	1	2	3	4	5	6	7
(50) Childlike	1	2	3	4	5	6	7
(51) Adaptable	1	2	3	4	5	6	7
(52) Individualistic	1	2	3	4	5	6	7
(53) Does not use harsh language	1	2	3	4	5	6	7
(54) Unsystematic	1	2	3	4	5	6	7
(55) Competitive	1	2	3	4	5	6	7
(56) Loves children	1	2	3	4	5	6	7
(57) Tactful	1	2	3	4	5	6	7
(58) Ambitious	1	2	3	4	5	6	7
(59) Gentle	1	2	3	4	5	6	7
(60) Conventional	1	2	3	4	5	6	7

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