THE TYPE A BEHAVIOUR PATTERN AND ITS ASSOCIATED PERSONALITY VARIABLES IN CHD, ULCER, ASTHMA, NON-PSYCHOSOMATIC PATIENTS AND HEALTHY CONTROLS.

A Thesis submitted to the Department of Psychology, University of Cape Town, in fulfilment of the requirement for the Degree of Master of Science in Psychology.

By Aviva Ayzenberg, B.A. (Tel Aviv University, Israel).

University of Cape Town

1983

ACKNOWLEDGMENTS

I would like to express my sincere appreciation to the following people for their assistance and encouragement:

Mr Fakhri Davids, my supervisor, whose invaluable assistance and support enabled this research project to take shape in written form.

Dr. Tim Dunn for his understanding and assistance with statistics.

Medical staff members of Groote Schuur Hospital, without whose cooperation this project would not have been possible. I would like to thank particularly Sisters Lettie Prins and Stephanie Heyns for the time spent by them in this study.

Mrs Pippa Maartens for assistance with language problems which seemed to be insurmountable at times.

To all the subjects taking part in the study, especially to the Hospital patients who made a great effort by filling in the questionnaires.

To Mrs Lynda Blomerus who typed with dedication and patience.
To Mr Andrew Basson who did the printing.

A final word of thanks must go to my husband, Dr. Oded Ayzenberg, for his support, real help and understanding in times when these were greatly needed, and to my three children, Yadid, Tomer and Maya who understood that "Mummy was busy".

TABLE OF CONTENTS

LIST OF TABLES

"The understanding and control of disease requires that the body mind complex be studied in its relation to external environment ..... Clinical experience reveals that many and perhaps all disease states are the expressions of both organic and psychic factors".

(Dubos, 1968; cited in Hill 1976: p2).

ABSTRACT

In recent years, the relation of the type A behaviour pattern to coronary heart disease (CHD) has been receiving growing attention. To date, however, no studies have examined the type A concept in its relation to other psychosomatic pathology. In the present study, five groups are compared in relation to type A behaviour: CHD, ulcer, asthma, non-psychosomatic patients and healthy controls. Firstly, an attempt is made to establish whether a sample of white, male, South African CHD patients show a greater incidence of type A behaviour than do the other groups. Research conducted predominantly in the U.S.A. and to a lesser extent in Europe, indicates a higher incidence of type A behaviour among CHD patients. The second aspect of this investigation refers to the question of specificity of the type A behaviour to CHD. Clinical observations have suggested the possibility that type A behaviour may be characteristic of both CHD and duodenal ulcer patients.

A further aim of the study is to illuminate those personality variables associated with the type A behaviour pattern. The sample was comprised of 70 subjects, there being 14 subjects in each group. Two questionnaires were individually administered: (1) The J.A.S. (the type A behaviour questionnaire) and (2) the PRF (personality research form).

One of the J.A.S. scales, the speed and impatience scale, showed

a significant difference between the CHD group and all the other groups ($p<.05$) while CHD alone scored higher only at the ($p<.10$) level. These results suggest that there is not sufficient evidence for viewing the type A behaviour as specific to CHD: the possibility exists that duodenal ulcer is also characterised by a greater incidence of type A behaviour, as measured by the type A scale of the J.A.S.

The scales "job involvement" and "hard driving" of the J.A.S. were not found to be significant in comparing the groups. The correlational analysis between the J.A.S. scales and the PRF scales showed achievement, aggression and dominance to be the central variables in type A behaviour. However, by constructing sets of PRF variables which predict the type A scales, we find that additional variables appear: when in the set of predictors, the variable "autonomy" is negatively correlated to the type A scale. This suggests possible element of dependence which is further supported by an indication of a positive correlation between "succorance" (appearing amongst the set of predictors) and the "hard driving and competitiveness scale". A high correlation between the PRF scales of aggression and defendence suggests the possibility of viewing the aggressive behaviour characteristic of the type A person as a defence mechanism against underlying insecurity. This was already postulated in the psycohsomatic theories of Dunbar (1947) and Arlow (1945).

I. THE PSYCHOSOMATIC APPROACH

1.1 A SHORT HISTORICAL OVERVIEW

The psychosomatic approach is based on the axiom that disease occurs not only in cells or in organs but in the person as a whole (Weiner 1977).

People are not only predisposed to disease by virtue of their genetic endowment, but the occurrence of disease is also the product of culture, education and childhood experiences.

Therefore, we cannot study disease in abstraction from the human, social and cultural environment. Since the focus of the present study is the psychological and behavioral pattern associated with coronary heart disease (CHD), we shall only briefly present the concept and origins of psychosomatic illness. Lipowski (Hill 1976: 1) defines psychosomatic medicine as follows:

1. A science of the relationships between psychological, biological and social variables, as they pertain to human health and disease.
2. An approach to the practice of medicine that advocates the inclusion of psychosocial factors in the study, prevention, diagnosis and management of all diseases.
3. Clinical activities at the interface of medicine and the behavioral sciences. These are subsumed under

consultation-liaision psychiatry.

Although psychosomatic illness is a concept of the 20th century, the issues were already being grappled with by ancient philosophers as the problem of the mind-body relationship. Thus Socrates (496BC - 399BC) held that the Barbarians Thrancians were in advance of greek civilisation in that they already believed that body illness could not be healed without concern for the mind. Similarly Hippocrates (466BC - 375BC) had emphasised the importance of environmental factors in health and disease. Furthermore, he also recognised the importance of the relationship between the physician and the patient in the treatment of illness. Later, Galen (131BC - 201BC) discussed the role of the four humours in diseases of the body (Lipowski, 1977). However, these early points of light, were followed by the era of the dark ages which was dominated by metaphysical preoccupations and demonology freezing the progress for many centuries.

At the beginning of the 13th century, naturalism (the belief in the ability of nature to explain phenomena) started to replace demonology. The scientific approach however, did not gain real importance until the 17th century. The role of the mind in physical illness was revived by several physicians between the 17th and 19th centuries. Wittkower (Lipowski 1977) describes the contribution of the following pioneers in this respect: Sydenham (1624-1689) and Reil (1759-1813) clearly recognised the mutual interaction

between psychological events and physical events. Heynroth (1773-1843) introduced the idea of internal conflict as a basis of mental disease and was the first to use the term"psychosomatic", while Carus (1789-1869) believed in a rather vague way that the unconscious animates all physiological processes. By the end of the 19th century progress in the fields of morbid anatomy, microbiology and biochemistry resulted in substantial advances in the science of medicine.

However, the idea of a malfunctioning of an organ as the sole cause of disease, and of disease as resulting only from damage to cellular structures had little application to psychiatry, which dealt mainly with afflictions of the mind. Thus, until the beginning of the 20th century, psychiatry as a field of study, was isolated from the mainstream of medicine. During this time there were some new developments in neuroanatomy and neurophysiology but the psychological understanding of the mentally ill still lagged behind. Neurology as an exact science was considered superior to psychiatry, and the cleavage between psychiatry (concerned with the mind) and other medical specialities (concerned with the body) was wide. This was much changed by the work of three eminent scientists in the psychological field, Freud (1856 - 1939), Pavlov (1849 - 1936) and Cannon (1871 - 1945) who paved the way for the introduction of the psychosomatic approach and research in medicine.

Freud (Alexander,1952) via his initial studies in neurophysiology developed psychoanalysis as an operational tool to study psychological causal sequences. His construct of the "unconscious" helped to establish the fundamental dynamic principles of psychological causality. He empirically studied the influence of the unconscious upon behaviour and bodily symptoms. This led to the development of psychodynamics as a basic science of psychiatry and it made possible the development of what might be called the psychosomatic era of medicine.

While Freud's psychoanalytic methods made possible the study of psychological causal sequence and their connection to body symptoms, Cannon's (1932) animal experiments in which he studied the adaptive bodily responses to fear and rage, prepared the way for a systematic and controlled study of psychophysiological reactions. According to Cannon, emotions are energisers. This means that situations evoking fear and rage could provoke important changes in the body (fight and flight reactions). He elaborated on the complicated interaction between endocrine glands and vegetative functions, and showed that emotional tension could be conducted to any part of the body via corticothalamic and autonomic pathways. He also developed the concept of homeostasis: the notion that excitation of the sympathetic nervous system together with adrenaline secretion is an emergency reaction, led him to trace the interlocking mechanisms by which the organism maintains

a dynamic equilibrium despite environmental changes.

A different approach comes from Pavlov (Lipowski 1977) who sees the highest cerebral processes as elaborations of simple conditioned reflexes. These higher cerebral processes are therefore subject to inhibition and excitation. The concepts of conditioned and unconditioned reflexes, helped him to induce stress experimentally and measure emotions as correlates of physical stress.

Thus, by the beginning of the 20th century, a primary psychological-neurophysiological model of the unity of the organism was being formulated. Tools for measurement of emotions and techniques for access to repressed unconscious psychological states were now available. The psychosomatic movement as such, started in Germany and Austria in the second and third decade of the 20th century. In reality a breakthrough in medicine (including psychiatry) occurred: Diseases previously regarded as obscure in origin, had found some explanation and the prospect of treating them by psychotherapy appeared promising. An example of the use of psychoanalytical concepts in the understanding of somatic disease was the work of Garma (1958) who demonstrated in his case material that regression might occur not only in the sphere of psychic events, but also at the level of somatic events. For example, by means of a mental mechanism such as introjection, anxiety about the image of an internalized aggressive mother could, through regressive fantasies, find symbolic experssion in, for example, disturbed gastrointestinal function.

Unlike Garma who saw symbolic expression in disturbed body function, Dunbar (1948) saw the so-called "psychosomatic dysfunction" as affect concommitant. She studied large numbers of patients with organic diseases and noted marked similarities in the personality profiles of those suffering from the same disorders. She described the "ulcer personality", the "coronary personality", the "arthritis personality" as well as many others. She believed these personality profiles to be of diagnostic, prognostic and therapeutic significance.

Having discussed some of the historical aspects of psychosomatic medicine leads us to present two important theoretical frames of reference of the subject. These theoretical views refer to the specificity of factors in the etiology of psychosomatic illness. The one is the theory of the specificity of emotional factors, and the other is the theory of the specificity of individual response (I - R specificity).

1.2 THE SPECIFICITY OF EMOTIONAL FACTORS

The theory of the specificity of emotional factors of Alexander (1950) dominated the first phase of psychosomatic medicine between the early 30's and the 50's. Alexander postulated a causal link between the specific constellation of unconscious conflicts, of psychological modes of dealing with them and of their emotional and physiological correlates on the one hand, and the development of one of the several organic diseases on the other. According to him, three variables are operative in the etiology of psychosomatic disorders.

These are:

1. Inherited or early acquired organ or organ system vulnerability;
2. Psychological patterns of conflict and defence formed early in life; and
3. A corresponding precipitating life situation.

Alexander's hypothesis was as follows: A patient with a vulnerability of a specific organ or somatic system and a characteristic psychodynamic constellation develops the corresponding disease. This happens when events in his life mobilise his earlier core conflicts and break down his primary defences against these conflicts. According to Alexander, a specific psychodynamic conflict

will be associated with specific disease.

1.3 I - R SPECIFICITY

In contrast to Alexander who emphasised the specificity of emotional states or psychodynamic factors in the etiology of the disease, more recent theories (Engel 1960) used the term specificity in reference to the physiological response which is specific to the individual. These theories assume the existence of a predisposing organic state which renders an individual susceptible to psychosomatic syndromes in general and/or to a specific syndrome. The organic component is typically defined as susceptibility, overactivity, damage to a particular organ system or as a combination of these factors. Thus was the term I-R specificity coined by Engel (1960) to refer to the tendency of an individual to respond maximally and consistently in the particular physiological system. In other words, in a particularly stressful environment, a person would be expected to develop the psychosomatic disorder associated with the physiological system in which that person shows the greatest response to stress (Cohen, Rickles, McArthur (1978)). The stress could be of any kind, and does not have to be evoked by a specific psychodynamic constellation. I-R specificity has been experimentally demonstrated in a healthy population by Engel (1960). He presented subjects with five stimuli and measured the response magnitude of eight physiological variables, finding that regardless of the nature of the arousing situation an individual responds

with his or her particular idiosyncretic pattern of autonomic activity.

1.4 MULTIFACTORIAL APPROACH TO PSYCHOSOMATIC ILLNESS

A recent change in psychosomatic theory and research is a shift away from psychodynamic formulations which focus on unconscious motives, conflict and defences. Rather, the emphasis has been on explaining the effect of environmental and particularly social factors in psychophysiological functioning and on the onset, course and outcome of various disease states in groups of individuals (Hill 1976). This change of emphasis expressed itself in the investigation of social factors such as stressful life events and life change (Rahe 1975) (Dohrenwend 1973).

According to Lipowski (Hill 1976) it should be emphasised that the addition of an ecological dimension to psychosomatic theory neither replaces nor invalidates the psychodynamic hypothesis about the inner life of individuals and its effects on health. On the contrary, the recent emphasis on the stimuli emanating from a person's social environment represents a logical and indespensible complement to the theoretical and investigative approaches focused on individuals - approaches that were the focus for the early psychosomatic works.

The effect of conditions of work, urbanisation, mass communication, noise and crowding on mind and body have

been discussed by a number of researchers (Hinkel, 1967, Mead, 1947; Lipowski 1973). Lipowski (1973) views the physical and social environment as relevant to psychosomatic relationships in the following way: The social environment acts as a source of information which is processed by the central nervous system. The responses to this information input involve activation of the central nervous system, and cognitive appraisal of the input. Some stimuli may set off impulses to the lymbic system and the hypothalamus, and by activating them, bring about emotional and autonomic arousal. An information input which causes intense emotional arousal, strains the individual's adaptive capacity, and may be called a stressor. Emotional arousal related to the subjective meaning of a given information input tends to elicit strategies aimed at attenuation of the unpleasant feeling and the related distress. Such coping includes the operation of unconscious ego defences. If the adapting capacity is inadequate (that is, an appropriate response is not possible), then the person is liable to exhibit a state of general susceptibility to disease. Whether an illness ensues and whether it takes the form of somatic or behavioral disorder or both, is determined by specific individual vulnerability, innate or acquired as well as by the presence of specific pathogens.

Thus, if physiological, psychological and social defensive and supportive mechanisms fail to protect the person, then

he is liable to become ill. These illnesses which result from an externally demanding situation (stressor) in combination with an inability of the individual to respond appropriately include such categories of psychosomatic disease as peptic ulcers and asthma.

We shall now briefly refer to these two psychosomatic diseases in order to illustrate some of their psychological elements. CHD which is the focus of the present study will be discussed in the next chapter.

1.5 PEPTIC ULCER

1.5.1 Definition and some psychological elements

Peptic ulcer is a term used to refer to a group of ulcerative disorders of the upper gastrointestinal tract which appear to have in common the participation of acid pepsin in their pathogenesis. Their major forms are chronic duodenal and gastric ulcer. The present knowledge of the etiology of peptic ulcer is incomplete, but studies in humans and animals indicate that acid pepsin is crucial for the development of peptic ulcer (Harison 1980).

Alexander (1950) observed that his male ulcer patients were commonly in emotional conflict between persisting infantile desires to be cared for, protected and loved (nourished) and the constraints placed on these desires by adult life. These constraints are of different kinds:

(a) They might be intrapsychic, in which a sense of guilt or shame over the infantile wish leads to an exaggerated display of autonomous independent or self-reliant behaviour,

(b) They might be external, in which case the patient actively seeks out gratification of these wishes, but at the same time is disappointed and unsuccessful.

Alexander stated that this chronic oral conflict over passivity and dependency provided the psychological predisposition to ulcer disease because it promoted chronic gastric hypersecretion. (He did emphasise that there must also be non-psychological predisposing factors, although these were unknown). When this wish to be cared for becomes acutely intensified it has as its neurophysiological correlate a central nervous system state ordinarily associated with the anticipation of food. This results in further increases in gastric secretion and motility mediated by the vagus nerve. De Muzan and Bonfils (1961) in their study concluded that the unconscious oral motives of peptic ulcer patients may find expression in at least four different personality types:

1. Stable, not particularly competitive persons;
2. Pseudoindependent-driven, ambitious persons;
3. Overtly passive dependent and parasytic persons;

4. Persons who vascillate between asserting independence from others and between being very dependent upon other people.

Subsequent studies by Meerhof and Weitman (1963) and Sapir (1962)(Weiner, 1977) supported Alexander's view that unconscious motives for love and protection may either be directly expressed in the patients relationships with others, or they may be reacted against so that the patients become excessively independent.

Excessive independence of the ulcer sufferer is described also by Dunbar (1947). According to her view, the ambition and activity which characterise the ulcer patient, are caused by a desire to escape from his own dependence (originally, on the mother) and protection needs. The compulsion to assert his individuality gives him the appearance of the "go-better".

A picture of an independent, driven patient also emerges from some other clinical descriptions of the ulcer sufferers. J.W. Paulley (1979, p:1238) cites Davies and Wilson (1937) who said: "Peptic ulcer is common in the cities, in the young and vigorous, and those dynamic in outlook. The typical patient is a restless active man of spare build. A man of aggressive alertness to tackle any job or any problem". Similarly Paulley cites Robinson (1955) who says that: "They display enthusiasm for any project in hand and execute their task with zeal and sometimes with a degree of excitability".

1.6 ASTHMA

Asthma is defined as a syndrome characterised by episodes of obstruction to adequate air exchange in the lungs, the clinical manifestations of which include wheezing respiration, dyspnoea, coughing and excessive mucous production (Haynes and Gannon, 1981). The most popular classification is that of Rackemann (Haynes and Gannon, 1981) in which asthma is considered to be either extrinsic (due to allergic reaction), intrinsic (due to non-allergic,infections and the like), or a combination of these factors. Clinically, most patients fall into the latter category. Psychoanalytically dominated psychiatry considers the cause of asthma to be the suppression of an intense emotion, in particular, the patient's suppressed cry for his or her mother (Alexander, 1950).

Alexander emphasised that the dependency conflict in bronchial asthma was different from the oral dependency conflict he had hypothesised in peptic ulcer disease. In ulcer, the content of the conflict was the wish to be fed by the mother. In asthma, the conflict had its roots in exaggerated unconscious wish to be protected and encompassed by the mother. However, the current status of knowledge does not allow us to relate the etiological role to psychological factors. A number of empirical studies provide concrete evidence that refutes Alexander's theory. It was found for example, that actual seperation of the child from his family may result in alleviation of his symptoms (Peskin, 1960).

Some researchers such as Knapps et al (1957, 1970) concluded that the conflicts Alexander hypothesised were not always present in their patients. Rather, the authors describe the presence of passive dependent social attitudes.

Some research (Neuhas, 1958) has been conducted towards validating the proposition that asthmatics exhibit a characteristic pre-morbid personality pattern. However, no difference was found between asthmatics and other groups of chronic disease sufferers. The current consensus is that asthmatics do not exhibit unique pre-morbid personalities but that these profiles are more probably the consequence of the prolonged coping with the disease itself, rather than being a reflection of a pre-morbid personality type (Haynes and Gannon, 1971).

"If the emotion be not discharged in outward bodily activity or in suitable mental action, it will act upon the internal viscera and derange their function; Sorrow is soon discharged by passionate wailing and weeping; It is the grief which does not speak that whispers the overfraught heart".

(Maudsley, H. 1876; cited in Luban Plozza and Poldinger, 1974, P:16).

2. CORONARY HEART DISEASE (CHD)

2.1 Definition and some etiological aspects.

Unlike inconsistencies found in the psychosocial research of asthma and ulcer, the research into CHD is pointing to the possibility of specific personality (or behaviour) pattern associated with the disease.

CHD is defined as a disease spectrum of diverse etiology with the common factor being an imbalance between myocardial oxygen supply and oxygen demand. This imbalance is usually related either to an absolute reduction in coronary blood flow or to an inability to increase coronary blood flow relative to the needs of the heart. This is most often due to atherosclerotic obstruction of large coronary arteries. Coronary heart disease is the major cause of death in the United States of America and much of the industrialised world, and accounts for 36% of male deaths between the ages of 35 - 64 (Harrison, 1980).

For clinical purposes the manifestations of coronary atherosclerosis are described as clearly defined entities. However, these syndromes are difficult to relate to the actual coronary artery pathology because identical atherosclerotic lesions may be responsible for either sudden death, myocardial infarction, stable or unstable angina, or there may be no symptoms at all (Chesler, 1981).

Etiological studies supported the contention that coronary atherosclerosis is a result of dietary induced hypercholesterolaemia.

Countries like the United States of America, Finland, Western Europe and Australia consume excessive amounts of fat from animal sources, and CHD is extremely common among these populations. On the other hand, incidence of the disease is low in the underprivileged races of the far east and Africa. The Chinese of Taiwan and the Japanese are rarely affected in their native countries but when translocated to American environment, the risk of the disease is increased. Hypertension, especially when coexistent with hypercholesterolaemia was found to be a risk factor to CHD. Cigarette smoking, obesity, diabetes and family history were found to be associated with elevated risk of the disease (Chesler, 1981).

According to Buell and Eliot (1980), it is difficult to separate the role of behaviour and environment from the accepted risk factors (physiological). Each risk factor is composed of genetic, environmental and behavioural components which can all be provoked, enhanced or sustained by influences which are beyond simple metabolic or pathophysiological explanation. For example, the high fat intake of the upper middle class western man can be seen as the major cause of elevated serum cholesterol, but rapid industrialisation and resultant socioeconomic stress can also be precipitating factors. Precisely how these factors act in the pathogenesis of CHD is not completely known. There are various hypotheses in this regard which shall be discussed in a later chapter on physiological mechanisms linking personality styles to CHD.

This brings us to the discussion of some research done on the effects of psychosocial and behavioural factors on CHD in animals. This kind of research has the "advantage" of manipulating social

factors and stress in controlled conditions of laboratory, which for ethical reasons, is impossible in human studies.

2.2 PSYCHOSOCIAL INFLUENCES IN CHD IN ANIMALS

Results from animal expierments directly link the psychosocial disturbances with pathological changes in the cardiovascular system. Thus, Mason (1968) showed that psychosocial stimuli can elicit either of two endocrine responses:

1. Arousal of the pituitary adrenal cortical system or,
2. Arousal of the sympathetic adrenal medullary system.

He showed that downward displacement in the social hierarchy leads to stimulation of the adrenal cortical system with mental depression, decreased gonadotropin levels, increased vagal activity, gluconeogenesis and pepsin production. In contrast, the sympathetic adrenal medullary system is called into play when agonistic or competitive behaviour is invoked. This happens in an attempt to maintain status and prevent threatened loss of esteem and/or loss of a related object or attachment.

Lapin and Cherkovich (1971) demonstrated the influence of social factors on the development of CHD by manipulating the social situation of dominant male baboons. The male baboon usually adopts his female when she is still immature and develops an intense attachment to her.

The researchers seperated the dominant male from his mate

and put her with other males in a cage in full view of the mate. As a result, the isolated mate began to show intense agitation and after several months hypertension and other evidence of CHD developed. The group of baboons on which the experiment was done showed a significant number of cases of hypertension, coronary insufficiency and acute myocardial infarction.

In an experiment done in the Philadelphia zoo, Ratcliffe (Buell and Eliot, 1980) noticed an increase in CHD after an attempt had been made to artificially assemble family groups. This resulted in conflicts, breeding failures and abnormal behaviour.

Henry and Ely (Buell and Eliot, 1980) have pointed out that social stimuli do not act directly on the individual but are mediated by the individual's perception of the social environment, which in turn is affected by his personality, role and status. These factors arouse emotions which induce physiological responses. The physiological consequences of psychosocial provocation are grafted upon a foundation of cultural and genetic predisposition and are principally effected through cognitive mechanisms.

Discussing the importance of psychosocial factors in CHD research on animals, brings us to present these factors as they have been investigated in human studies.

2.3 PSYCHOSOCIAL RISK FACTORS IN HUMAN STUDIES

The classical risk factors (elevated blood pressure, elevated serum cholesterol, cigarette smoking, obesity, diabetes and family history) fail to provide a complete and sensitive prediction of CHD development in groups and individuals (Jenkins 1976). Large population studies, such as the one conducted by Gordon, Garcier, Palmier and Kagan (1974) compared the incidence of CHD in three places: Framingham (U.S.A.), Honolulu (Hawaii) and Puerto Rico, controlling for the standard risk factors, they still found a significantly higher incidence of CHD in Framingham. They concluded that not all the standard risk factors are valid predictors of CHD in all cultural settings. Psychosocial and behavioural variables offer the possibility of accounting for at least part of the causes of CHD still remaining unexplained. This was noted as early as 1628 by Sir William Harvey, who wrote: "Every affection of the heart that is attended with either pain or pleasure, hope or fear, is the cause of agitation whose influence extends to the heart". (Leibowitz, 1970, p: 64).

In 1649 Harvey described an angina (CHD) patient as follows: "Received an injury and affront from one more powerful man than himself and upon whom he could not have his revenge, was overcome with anger and indignation which he yet communicated to no one". (Leibowitz, 1970,p: 64).

The effect of a variety of psychosocial variables, among them, anxiety, neuroticism, stressful life events and

dissatisfaction was studied in relation to CHD. The reuslts are conflicting and do not show clear correlations between these factors and CHD (Rahe and Lind, 1971; Theorell and Rahe, 1972; Lundberg et al, 1975). In general, some of the results suggest that life changes that deprive individuals of important sources of emotional security, self esteem or sense of identity are likely to be followed by a higher than normal risk of various kinds of disease (Davies, 1981). In the case of cardiovascular disease it has been found for example, that widowers suffer an above average mortality rate in the first five years after bereavement and much of this is accounted for by cardiovascular disease. (Parkes et al, 1969). Several studies have used clinical psychological tests, especially the MMPI and the Cattell 16PF, to compare CHD patients with normal controls (Ostfeld et al, 1964).

Jenkins, after a careful review, summarised the findings as follows: "Patients with CHD differ from persons who remain healthy on several items of the scales, especially those indicating the presence of neurotic patters and of having more feelings of inner tension and at the same time trying to be more self sufficient and independent than normal controls". (Jenkins, 1971, 307). Bendier and Groen (1963) found that patients after myocardial infarction scored higher than a control group of healthy individuals on a neuroticism scale but lower than other sick patients. They interpreted that

to mean that under the influence of the disease, CHD patients tend to complain more than healthy individuals. On the other hand, they found as expected that CHD patients inhibit emotional discharge more than other patients in a similar situation. Medalie et al (1968) found that subjects with CHD (identified during a prevalence study) scored higher than healthy controls on questions such as: "do you often feel anxious?" and " are you troubled by nervousness?".

In an interesting study done by Groen, Cuttman and Dreyfuss (Hill 1977) and another by Groen and Drory (1967), it was found that CHD patients scored higher than a control group of healthy patients on questions about psychosomatic complaints including: headache, dizziness, backache, fatigue, anxiety and insomnia. However, in a second study conducted by them they asked relatives of patients who had died from myocardial infarction about the psychosomatic complaints of the deceased. They found a lower incidence of psychosomatic complaints among CHD patients than among those who died of other causes. The contrast between complaints of living CHD Patients and those recorded by relatives of patients who had died from the disease, may indicate an inhibition amongst terminal MI patients to complain to others. It may also mean however, that patients might record complaints more easily in answers to a questionnaire rather than to their relatives. This would support the general hypothesis of Rosenman and Friedman (1970) that manifest anxiety is not a characteristic of the coronary prone personality.

A more promising area of study is that of sociological indices, in which the most striking differences in incidence of CHD are found. Such comparisons cannot of course separate the effects of genetic, sociocultural and geographical differences.

Studies by Keys (1970) found the highest coronary rates in U.S.A. and Finland and the lowest in Greece, Yugoslavia and Japan. William (1971) reported an even lower incidence of CHD in Nigeria, where a series of 8000 autopsies revealed only 6 myocardial infarctions involving atherosclerosis.

Race, sex, occupation, education and income have also been studied in relation to CHD. Most of these studies did not show consistent trends. Sigurjohnson (1971), Lehman (1962). Social mobility and status inconsistency were found in some studies to correlate with an incidence of CHD (Bruhn et al 1968) while in other studies no correlation was found (Bruhn 1968).

Since the possible link between psychosocial factors and CHD can be explained through the concept of stress, this concept will be now discussed in the context of CHD.

2.4 THE CONCEPT OF STRESS

Selye defines stress as: "The non-specific response of the body to any demand". (Wheatley 1981: 2). Russek and Russek (Wheatley, 1981) discuss the mastery of stress in connection with CHD, claiming that the magnitude of stressors* in our environment influences a group's susceptibility to CHD. Moreover, the adaptive capacity of each person may be a major determinant of individual susceptibility.

There is mounting evidence to support the belief that vulnerability to mental and emotional disorders, to CHD and to other psychosomatic syndromes, may be correlated with the ability or inability of the individual to handle stress over extended periods. All individuals have a characteristic manner of responding to an acute threat, (this reponse being in keeping with the basic disposition of the personality) but it is only in those who fail to adapt to repetitive or continued stress that sustained reactions may predispose them to subsequent disease.

Funkenstein et al (1957) have clearly shown in studies of young college students that many individuals fail to adapt to recurrent exposure to stressful stimuli. In consecutive experiments inducing frustration, in a group of college students, the authors were able to identify subjects who exhibited a significant physiological response initially, which either

* Stressor is an agent that produces stress at any given time.

did not diminish or actually became accentuated in subsequent tests. In contrast, others were found in whom the degree of response was either minimal throughout, or of diminishing intensity with repetitive exposures. This supports the view that individuals differ in the degree of response to continued stress.

2.4.1 Stress adaptation and evolution

Darwin observed in the lower animals a process of natural selection. Assuming that man is subject to the same evolutionary forces, leads to believe that a similar process of natural selection determines who will survive in the complex human society (Wheatley, 1981)

Russek and Russek (Wheatley, 1981) discuss stress in terms of human evolution. According to them, since the appearance of homosapiens on earth, 3.75 million years were spent by them in the forest and 10,000 years on the farm. In contrast to these long periods, only 300 years were spent by man in the factory. Since the adaptation to changing environment may require hundreds of thousands of years, modern man could not have yet reached the capacity of coping adequately with the problems of an industrial, rapidly changing environment. Russek and Russek (Wheatley, 1981) claim that while the flight or fight mechanism was apparently designed for short-term emergency needs, it happens that coronary prone subjects often possess a homeostatic mechanism which remains chronically mobilised in an attempt to

maintain equilibrium in a rapidly changing environment.

Strümpfer (1978) while referring to the type A behaviour, presents an interesting interpretation of the flight or fight behaviour in modern society. According to him, this behaviour (fight or flight) cannot be operated in modern society, since it is a socially unacceptable behaviour. Consequently, there is no quick, natural resolution of the intense state of readiness for action and the cardiovascular system is left chronically overstimulated. This chronic state of stress could result in pathological biochemical changes.

According to Russek and Russek (Wheatley, 1981) the hypothesised pathological process is as follows: as a result of the chronic activation of the defence centre in the hypothalamus, cholesterol levels in the blood are maintained at a higher range, circulating catecholamines are present in increased concentrations, and clotting mechanisms are adversely affected. A high fat diet, cigarette smoking lack of exercise and diabetes could readily exert a harmful influence by exacerbating certain components of these physiological expressions of fight or flight.

In human history, a low incidence of CHD was observed in German concentration camps and in the occupied Scandinavian countries during World War II. This indicates that morbidity and mortality are probably determined by the nature of the

nutritional substrate upon which the psychological and physiological responses operate. In other words, stress and cholesterol appear to be dependent on each other for pathogenetic significance, supported by the fact that even in the very stressful environment of concentration camps, CHD was not prevalent, probably due to lack of nutrition, and hence, low cholesterol levels.

The relation between stress and atheroma can be presented in the following hypothesis:

2.4.2 The "chain of events" hypothesis.

Carruthers (1969) suggested that emotion, acting via the intermediary of enhanced sympathetic activity, results in increased mobilisation of free fatty acids from adipose tissue. In the absence of metabolic demand, these were converted to triglycerides and were then incorporated into atheroma.

The study chosen to verify the hypothesis was conducted on racing car drivers, because car racing was considered to examplify an extremely emotional and aggressive situation, associated with relatively minimal physical effort.

Plasma samples were taken from racing drivers at various times of the race. The results showed a linear relationship between the rapid rise in free fatty acids and cate-

cholamine levels, until a free fatty acid plateau was reached.

These results may support the thesis that the development of atheroma may be promoted by recurrent elevations of blood lipids induced by certain emotional life stresses.

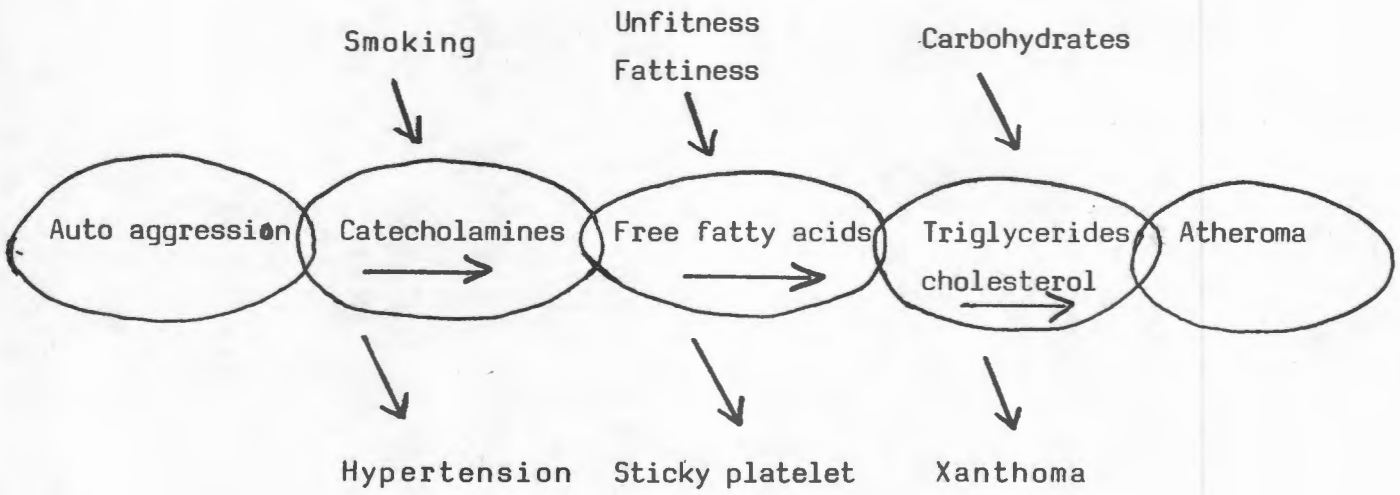


Figure 1: The chain of events hypothesis.

The efforts to identify these "certain emotional life stresses", were most fruitful in connection with the research conducted on the concept of the "coronary prone behaviour pattern" which is the subject of the following section:

3. THE CORONARY PRONE BEHAVIOUR PATTERN

3.1 THE CONCEPT OF "TYPE A"

"I believe that the high pressure at which men live and the habit of working the machine to its maximum capacity are responsible for arterial degeneration rather than excesses in eating and drinking".
(Sir William Osler, 1897 quoted in Bruhn et al, 1974: 187)

For many years observant clinicians noted that people with CHD, particularly the younger victims, were different in respect to emotions and behaviour from others without the disease.

Dr. John Hunter ((1729-1793), (Gentry 1979, 5)) who was himself a CHD sufferer, once stated that "My life is in the hands of any rascal who chooses to annoy me". The Menningers (1936) (Gentry 1979,) talked about strong aggressive tendencies in the CHD patient.

Since 1970, studies conducted at many research centres have supported earlier reports that a higher risk of CHD is present in persons manifesting "a coronary prone behaviour pattern". The greatest contribution in this area came from the work of Friedman and Rosenman (1974) who persued their research for more than 20 years.

Friedman and Rosenman (1974) define the coronary prone behaviour pattern as a characteristic action emotion complex.

This complex is exhibited by those individuals who are engaged in a relatively chronic struggle to obtain an unlimited number of poorly defined things from their environment, in the shortest period of time and, if necessary, against the opposing efforts of obstacles in the same environment. People who manifest this behaviour pattern are called Type A individuals, and those who have the opposite patterns - a relaxed unhurried, satisfied style - are called Type B individuals.

The coronary prone behaviour pattern (CpBp) is considered to be an overt behavioural syndrome or style of living, characterised by extremes of competitiveness, striving for achievement, agressiveness (sometimes stringently repressed), haste, impatience, restlessness, hyperalertness, explosiveness of speech, tenseness of facial musculature and feelings of being under pressure of time and under challenge of responsibility. Persons having this pattern are often so deeply committed to their vocation or profession, that other aspects of their lives are relatively neglected. Not all aspects of this syndrome or pattern need to be present for a person to be so classified. The pattern is neither a personality trait nor a standard reaction to a challenging situation, but rather, the reaction of a characteristically predisposed person to a situation which challanges him. The CpBp is the manner in which some people confront life situations (either pleasant or troubling) when an element of challenge is perceived to be present (Jenkins 1971).

3.2 CLINICAL DESCRIPTION OF THE TYPE A PERSON

Jenkins (Gentry 1979) outlines the characteristics of the type A person as follows:

3.2.1 Values, style of thought and interpersonal relations

The coronary prone behaviour pattern is best assessed by observing the subject in action. The type A individual will direct himself sharply towards his goal, will gesture with abrupt assertive movements, will speak rapidly with bursts of amplitude for emphasis. He will show a lack of openess to extraneous stimuli not related to his selected goals. The type B person is more relaxed and open to the environment he may accomplish as much in a given time as the type A, but his movements are more modulated, his voice is even and unhurried and he does not appear to be as intensely involved.

He is not bothered by small diversions from the immediate goal. Type A is conscientious in an inflexible way. He is very critical both of himself and others. He is 'inner directed', rather than 'outer directed'.

The type A individual prefers being respected for what he does whereas the B usually prefers to be loved for who he is.

Therefore, type A has to maintain productivity in order to maintain his feeling of self worth. He does not allow himself

to relax. This is a sort of protestant ethic, expressed with a vengeance. The type A is compulsively attracted to competition and challenge. Where nobody else is around he can compete against himself, trying to better his own previous record. For the type B, however, competition means a social interaction, a source of joy and fun.

The main source of gratification for the type A is his job, while the type B enjoys family, friends, cultural events, etc. Either type A or type B individuals may participate in political or community activity but the type A person will be the one who seeks leadership.

The type A person tries to do several unrelated things simultaneously. He anticipates what is coming next, and begins reacting to it in advance, for example, he will anticipate what another person will say next, and he starts answering a question before it was completely asked. Type B persons are not in such a hurry and they do one thing at a time. The type A individual always looks "ready to move", while type B projects a more comfortable air.

The type B person refers to everyday tasks as to a great challange and he fights the "time barrier". He does not give up even when fatigued, in contrast to type B who tends to give up when a problem cannot be realistically overcome.

Type A appears to be self centered and poor listener to others, while the type B person seems to be more interested in people.

Feelings of anger are more easily aroused in type A person then in type B, but because of high standards of "good conduct" he tries to inhibit expressions of hostility, and he often denies the intensity of these feelings. In the work situation, the type A person tends to feel upset by his boss's demands and impatient toward subordinates, either for their slowness or for the poor quality of work.

The type A person often expresses an overt bravado. He is certain of his own correctness and feels that his capacity is superior. The type B is more often likely to recognise his own limitations. However, it seems that the overt bravado of type A really covers a deep-seated insecurity. In situations of repeated defeat, the type A may lose his self confidence and reveal his underlying feeling of inferiority.

3.2.2. Style of responses, gestures and movements.

The verbal flow of the type A is "staccato". He accents words with a burst of volume. The verbal expressions of the type B person are more smooth in amplitude. The type A wastes no words, speaks directly to the point unlike the type B person, who uses more qualifying phrases.

The type A individual is made uncomfortable when asked to slow down his speech. His appearance is of tensed, energetic movements. He tends to clench his hands or make fists when tensed. The type

B's gestures are more relaxed. Even when sitting at rest the type A is less likely than type B to sit still, he gives the impression of excess energy, bubbling out of the body

3.3 RESEARCH INTO THE RELATIONSHIP BETWEEN THE TYPE A BEHAVIOUR PATTERN AND CHD.

The Western Collaborative Group Study (WCGS) was the first large prospective study that included a measure of the CpBp on a group of subjects on which no diagnosis had yet been made (Rosenman et al, 1964). A structured interview was developed, that carefully observed the subject's vocal response styles and motor mannerisms, as well as the content of his answers. The WCGS was conducted as a blind prospective investigation in which the persons who rated behaviour types had no knowledge of other coronary disease factors and did not participate in the subsequent diagnosis of the presence of absence of CHD. The incidence of clinical CHD after surveillance periods of 4½, 6½ and 8½ years was 1.7 - 4.5 higher for men who possessed the type A pattern than for men judged to possess the type B pattern. Results of an autopsy study by Friedman et al (1973) revealed a greater degree of atherosclerosis in the coronary arteries of men judged to have been type A as compared with those rated type B. Similarly strong association has been reported between interview rating of the type A behaviour and severity of atherosclerosis as determined by coronary angiography (Blumental et al, 1978; Frank et al, 1978). Many studies utilised the J.A.S. (which will be later discussed) for measuring the type A behaviour,

and found that type A scores were statistically higher in CHD patients than in controls (Jenkins, et al 1971; Kenigsberg et al 1977; Glass 1977). Shekelle et al (1976) in a multivariant analysis in which all major risk factors were considered simultaneously, the type A score was found significantly associated with the presence of CHD. The strength of the relationship was about the same as that observed for blood pressure and serum cholesterol, suggesting that these factors are as important as physical risk factors. The cross cultural support for the type A pattern comes from a study done in Poland by Zyzanski (cited by Jenkins, 1976). He found that coronary cases scored higher on the J.A.S. (translated into Polish), than did healthy controls. Jenkins et al (1974) showed that there is a strong association between type A score and risk of recurrent myocardial infarction.

The severity of atherosclerosis was also found to correlate with type A score. Thus, Zyzanski et al (1976) and Blumental et al (1978) found a high correlation between severity of atherosclerosis and the scores on the structured interview (an interview which evaluates the type A behaviour), but did not find an association between severity and type A score when measured by J.A.S.

In addition to studies utilising the whole type A concept, other researchers have studied relationship of one or more of the components of the Cpbp with CHD. For example, in a study done in Australia by Wynn (1967), it was found that CHD patients are more likely to work many hours of overtime per week and to do two jobs simultaneously than are control patients. Studies by Bruhn et al (1974), Russek (1967), Thiel et al (1973) and Sales (1969) confirmed the excess of overtime work among men prior to

myocardial infarction.

A prospective study of Swedish twins by Floderus(1974) found items reporting time pressures and excessive job responsibility to preceed the development of Angina Pectoris.

There is much evidence that striving for achievement and competitiveness is associated with the risk of CHD:
Wolf (1967) noted that the coronary prone men strive without experiencing enjoyment and that CHD disproportionately effects those whose striving is frustrated and seemingly unrewarded. Van der Valk and Groen (1967) found their coronary patients to be more dedicated to work in an exaggeration of the "success ethic".

In the Soviet Union, Ganelina and Kroevsky (Gentry 1979) showed that CHD patients were classified in a group characterised by high ambition and acceleration of their rate of work, in an incidence 3 times higher than control patients. Bonami and Rimé (1979) found that feeling of high achievement and job involvement on a projective test were predictive of future myocardial infarction.

The fast moving, restless component of the type A pattern as a risk factor for CHD, found support in the studies of Mertens and Segers (1971). They described time pressures and seeking of greater responsibility as characteristic of CHD patients.

Similarly, the work of Thiel et al (1973) found coronary patients to have more rapid movement and excess drive as compared with a control group.

Hostility was reported by Theorell and Rahe (1972) to characterise coronary patients when they were slowed down. Theorell et al (1975) found that persons who admitted to becoming very hostile when held up in queues, had statistically higher risk of future infarction.

The type A behaviour pattern is being seen by several researchers as a coping-style for maintaining personal control over life events. In one of these studies, Glass, Snyder and Hollis (1974) reported that when the type A's were requried to work at a low rate of response, they exhibited impaired performance and behavioural signs of tension and hyperactivity (e.g. clenched fists, sighing etc). In another study, Krantz, Glass and Snyder (1978) observed that following exposure to moderate levels of uncontrollable loud noise, type A subjects learned to avoid subsequent aversive stimulation more quickly than type B's. However, when the pretreatment stressor was more intense, the type A's reacted more helplessly than did the type B's.

Considering these findings, Glass et al (1974) proposed that the type A behaviour pattern represents a coping style for maintaining personal control over life events. Thus, in situations that challange the belief in personal control, type A's attempt to regain a sense of mastery of the environment. This is characterised by a behaviour pattern of excessive drive, intolerance of delay, heightened work pace, and feelings of time pressure. For the type B on the other hand, the need for personal control may be less fundamental; he both appraises conditions of challange to be less threatening, and manifests fewer behavioural

correlates of the coronary prone personality.

3.3.1 The question of the specificity of the relationship between CHD and type A behaviour.

The problem of the specificity of the type A pattern as a risk factor for development of CHD, was discussed by Jenkins (1978). According to him, the current state of knowledge suggests that the type A pattern is specifically associated with atherosclerotic disease. In support of his thesis he cites a study done by Wardwell and Bæhnson (1973) in which CHD patients scored higher than other hospitalised patients on the type A questionnaire. There was no difference in the incidence of type A behaviour between the group of hospitalised patients and a group of healthy control patients. In another study, Gianturco et al (1974) found that patients with CVA (cerebrovascular accidents) scored slightly more in the type A direction (on the J.A.S.) than did patients hospitalised for a variety of other problems (excluding CHD and vascular patients). However, when the CVA patients were further divided into those with and without prior history of atherosclerosis or CHD, it was found that the group with such a prior history had substantially higher type A score than CVA patients without history of CHD. This latter group scored at about the average of the healthy population, on the J.A.S.

Jenkins (1978) concludes that the type A pattern is rather specifically associated with CHD, and is not found with more than average frequency in patients with other types of disease.

However, this finding needs further testing in patients with still other categories of illness, particularly the classical psychosomatic disorders.

Having discussed the studies investigating the type A behaviour pattern and its relationship to CHD, brings us to present the hypothesised physiological mechanisms linking the type A pattern to CHD.

3.4 PHYSIOLOGICAL MECHANISMS LINKING TYPE A TO CHD

The most recent explanations identifying the physiological mechanisms that link type A behaviour to CHD, propose that behaviour evidenced by type A individuals are accompanied by sympathetic neuroendocrine and haemodynamic responses, which might promote the onset or progression of atherosclerosis or the clinical manifestations of CHD, e.g. myocardial infarction, angina pectoris and sudden death.

Speculation about these mechanisms is supported by the studies which demonstrate that type A's, compared to type B's, display larger episodic increases in systolic blood pressure, heart rate and/or plasma catecholamines when confronted by appropriately challenging social situations or tasks. Moreover, even after disease is manifest, A-B differences in cardiovascular reactivity can still be observed, suggesting that these mechanisms remain active and may possibly influence the course of disease and subsequent clinical outcome as well (Krantz et al 1982). Caplan (1971) and French and Caplan (1972) have found measures of occupational stress (e.g. workload, responsibility for others) positively correlated with blood pressure, pulse rate and serum cholesterol in type A but not type B individuals. However, the nature of the pathogenic influence is still unclear: For instance, do persons who possess type A characteristics experience a more pronounced physiological response to stressful events which in turn favours the development of CHD; or are type A's simply more likely to engage in activities commonly associated with coronary risk such as habits of smoking, lack

of exercise and dietary indiscretion? Manuck, Craft and Gold (1978) reported the predicted relationship between coronary prone behaviour and physiological response: Mean elevations of systolic blood pressure proved significantly higher for type A than type B males on exposure to a distinctly frustrating cognitive task.

Most of the studies have found that type A behaviour and physiological correlates emerge only in specific situations which are viewed by an awake individual as challenging or stressful.

However, a recent study by Kahn (1980) found that even while under general anaesthesia for coronary artery bypass surgery (before maintenance on the heart lung pump), the type A's compared to the type B's evidenced greater increases over admission blood pressure.

These results suggest that there may be a nonconsciously mediated or constitutional basis for A-B differences in cardiovascular reactivity, since these responses are observed among patients under general anaesthesia.

The elevated heart reactivity under general anaesthesia of the type A patients supports the speculation that there is an underlying biological and/or psychobiological factor (e.g. early conditioning of sympathoadrenomedullary responses) which mediate both expression of type A behaviour and the link between type A and coronary disease.

Type A itself in part, reflects an excessive sympathetic response to environmental stressors. Although studies have not indicated that type A has a strong genetic component, perhaps excessive or repetitive eliciting of sympathetic responses over the course of a life span may both enhance the expression of type A behaviour and predispose to clinical coronary disease as well.

The interpretation of this heightened sympathetic activity of type A's is consistent with the view that coronary prone individuals have chronically elevated cardiac responses to life demands which in turn increase the demand for oxygen by the heart. Newlin and Levenson (1982) suggest a second possible mediational pathway that has not been considered before, perhaps because the theoretical development relevant to this alternative pathway has been both recent and controversial.

They propose that the immediate cause of CHD may be vasospastic attacks of the coronary arteries. Acute limitation of blood supply to the heart is created by vasoconstrictive activity of the coronary arteries, rather than by chronic increases in demand. In their research, they found that the type A subjects had more substantial peripheral vascular responses to psychosocial stressors (reaction time and stroop color-word test), than did type B's. They did not find differences in sympathetic cardiac responses related to contractility. This research supports an alternative hypothesis of the physiological mechanisms linking type A to CHD, but further research is needed in order to clarify this issue.

Since the present work tries to identify personality traits and needs associated with the type A behaviour pattern, we shall now briefly present Murray's Theory of Motivation which underlies the personality test used in this paper.

4. MURRAY'S THEORY OF MOTIVATION

According to Murray's views a personality is a lifelong series of episodes. Every episode is a variably complicated action which most often is the reaction of the organism to its physical and social environment. Every action is determined by integrating brain processes, which can be both conscious and unconscious. These processes are the result of many interacting factors which exist in varying proportions, external pressure, freshly aroused emotional needs (id), conscious intentions (ego), accepted cultural standards (superego) and customary modes of behaviour (habit system). The relative strength of these influences determine what tendencies will be expressed.

The most important concepts in Murray's theory are 'need' and 'press'. Every episode in the development of a personality can be described as a combination of these factors. The concept of need has a central position in the theory, and is defined by Murray as follows:
"A need is a construct which stands for a force (the psychic chemical nature of which is unknown) in the brain region. This force organises perception, apperception, intellection, conation and action in such a way as to transform in a certain direction an existing unsatisfying situation". (Murray, 1938, p:124). A press is defined by Murray (1938, p:118) as a "directional tendency in an object or situation". A press is a stimulus situation which has a qualitative aspect - the kind of effect which it has or might have on the organism. A need

can be evoked sometimes by internal processes (e.g. endocrinogenic) or by the occurrence of certain press in the environment. The need is manifested by leading the organism to respond to this certain press. Characteristically, a need is accompanied by emotion. A need can vary in intensity and endurability but usually it persists and evokes certain overt behaviour or fantasy. When the organism is competent and able to overcome the opposition of the environment, this behaviour changes the circumstances in a way that satisfies the organism.

Murray uses the term "need" as a synonym for "drive". It is a hypothetical construct (unlike "hormone" which is empirical). A hormone can be the generator of a drive, but it cannot be the drive itself. A chemical substance is one thing, the excitation which it sets up in the brain is another.

In the personological application of the theory, "need" is very often used as a disposition variable, as a term for the more lasting personality traits which determine the constant recurrence of a need.

Murray makes 4 important distinctions:

1. Primary (viscerogenic) needs and secondary needs.
The former are formed and satisfied by characteristic periodic bodily events, whereas the latter have no localisable bodily origins.

2. A further distinction is made between positive and negative needs.
Positive needs force the organism in a positive way towards other objects (e.g. food), while negative needs force the

organism to seperate itself from objects (e.g. urination).

3. Manifest needs are distinguished from latent needs.

This classification includes three groups:

(i) An objectified (overt or manifest) need - that is all action that is real, seriously and responsibly directed toward actual objects, whether or not it is preceeded by a conscious intention or wish.

(ii) A semi-objectified need - that is overt activity, playfully and imaginatively (irresponsibly) directed toward real objects or that is seriously directed toward imagined objects.

(iii) A subjectified need - this covers all need activity that find no overt expression.

4. A further distinction refers to conscious vs. unconscious needs.

Murray lists the following psychogenic needs:

1) Abasement, 2) Achievement, 3) Affiliation, 4) Aggression, 5) Autonomy, 6) Counteraction, 7) Deference, 8) Defendence, 9) Dominance, 10) Exhibition, 11) Harm-avoidance, 12) Infavoidance, 13) Inviolacy, 14) Order, 15) Play, 16) Rejection, 17) Sentience, 18) Sex, 19) Succurance, 20) Superiority, 21) Understanding.

According to Madsen (1968), Murray's theory is a classifying more than a deductive theory. Therefore, no systematically formulated hypothesis can be formed. Some implicit hypotheses, can however be detected. On the relation between motivation and behaviour, he states for example, that:

"When a need becomes active, a charcteristic trend of behaviour will usually ensue, even in the absence of customary stimuli".

Another important note about the relation between behaviour and needs is that "Only under rare or abnormal conditions, do we find behaviour patterns that exist for long without satisfying underlying needs". (Murray, 1938 : 100).

Some factors determine the establishment of a need as a ready reaction system of personality. Among these factors is the differing strength of needs at birth, or shortly after birth. Later in development, frequent gratifications (reinforcement) determine the strength of needs. Certain innate or acquired abilities will favour the objectification of some needs and not of others.

A need may also become established by repetition, due to the frequent occurrence of specific press.

Particular cultures and subcultures to which an individual is exposed may be characterised by a predominance of particular needs.

Murray has elaborated and refined the psychoanalytic conception of "complex" so as to represent a particularly important set of early childhood experiences. These experiences possess particular importance for the child development and for his personality and behaviour as an adult.
These areas of early childhood's experiences are:

1. The secure passive dependent existence within the womb.
2. The enjoyment of sucking nourishment from the mother breast (or bottle) and of the dependent lying in her arms.

3. Enjoyment of the sensation accompanying defecation.
4. Enjoyment of sensations accompanying urination.
5. The excitation that arises from genital friction.

All these experiences are interrupted by parental demands and socialization. In cases where the effects of these infantile experiences upon later behaviour are clear, Murray speaks about a "complex". It is presumed that all individuals have complexes of varying severity, but only in extreme cases it implies abnormality. Examples to these complexes are the "claustral" and "oral" complexes. Murray suggests three types of claustral complexes:

"1. A complex constellated about the wish to reinstate the conditions similar to those prevailing before birth.
2. A complex that centres about the anxiety of insupport and helplessness.
3. A complex that is anxiously directed against suffocation and confinement".

(Murray 1938, p:363).

The person characterised by the first type of claustral complexes seems to be dependent, passive, orientated towards the past and generally resistent toward change. He tends to display needs of harm-avoidance, seclusion and succorance. The opposite picture characterises the person displaying the third type of claustral complexes. He has the strong need for autonomy and change, activity and movement.

Passivity vs. autonomy can be displayed in the oral complexes as in the claustral ones. The oral succorance complex involves

oral activity combined with passive and dependent tendencies. The oral aggression complex combines strong aggressive needs, projection of oral aggression and needs for harm-avoidance.

It is beyond the range of this study to discuss in detail the relationships between various childhood experiences and later personality and behaviour patterns. However, since the subject of this work is the type A behaviour pattern, it is of relevance to discuss issues concerning the relationships between this behaviour type and associated personality variables.

5. THE RELATION OF TYPE A BEHAVIOUR PATTERN TO PERSONALITY VARIABLES.

The type A concept can be criticized for being rather behaviouristic and for not trying to explain the personality traits that are associated with the overt behaviour.

Thus, the concept in its present theoretical form cannot satisfy those who are interested in psychological dynamics.

Early psychosomatic theories described the "coronary personality" and on the basis of clinical observations analysed the driving forces of its behaviour. One of these theories is represented by Arlow (1945). He views the keystone of the coronary personality as a partial, deficient identification of the child with his father whose image is exaggerated beyond all proportion by the childhood anxiety. Being an adult, the person would behave as a youngster masquerading in his father's clothes. His competitive behaviour expresses an attempt to convince the world and himself that he is like his father. Although speculative, this theory offers clinical intuitions that are supported in research being conducted much later.

The description of the CHD patient by Dunbar (1952) resembles her description of the ulcer patient. According to Dunbar, the CHD patient is a hard worker, drives himself without mercy. However, while she describes the ulcer patient as trying to escape his own dependence and assert his individuality, the CHD patient seems to be driven by the need to excel and to compete with others.

The defences used by the CHD patient seem to be solid; however, these defences are strong only in a setting of highly crystallised life role to which he is well adapted. When the "shell is cracked", the insecurity and mental poverty of the CHD patient is revealed. The result is a rapid transition to bodily illness.

Although Dunbar did not use the concept of "type A behaviour", the personality profile described by her, bears a remarkable similarity to what was later coined as "type A behaviour". The important point that was emphasised in Dunbar's work, is that "The hard work is less responsible than the emotional conditions which led to it" (Dunbar, 1947, p:118).

Some attempts have been made to explore covert personality traits associated with CHD. Such a study was done by Bonami and Rimé (1979) on a group of CHD patients. By means of questionnaires differing in the degree of directness of their items, they tried to evaluate covert personality traits on the one hand, and overt behaviour patterns on the other.

On the basis of their results they suggested that the coronary personality is at a covert level, characterised by traits of passivity, impulsiveness and dependence. This profile is distinctly inconsistent with the type A pattern. However, on the overt level (by means of interview and not questionnaire), the same passive personality was characterised by a typical type A behaviour pattern. The investigators speculated that the need to disguise unaccepted traits like passivity, dependence and impulsiveness leads the coronary subjects to display through

their interpersonal contacts the characteristic type A pattern (competitiveness, hard driving, striving for achievement).

This interpretation of type A supports the early clinical theory of Arlow (1945). The problem of personal image displayed in social situations seemed to be central in the coronary personality. The scales showed a higher tendency among coronary subjects than among controls to assert and protect their social appearance through verbal exhibitionism and through a need to reply to critics and to justify their failures.

Ray and Simons (1982) are critical of these results: They claim that the passive personality picture which Rimé and Bonami described as being characteristic of the coronary prone person is an artifact resulting from not having controlled for age. They argue that when controlling for age in this study, there should be no correlation at all between type A characteristic and coronary disease. Another effort to identify personality correlates of the type A behaviour was done by Ray and Bozek (1980). They found that type A's (as measured by the J.A.S.) were achievment motivated and dominant. A factor analysis showed these two traits to be the main components of the A-B concept with only an additional third factor of Freneticism. They question whether the type A scale is measuring anything other than achievement motivation and dominance. In this case, the development of the type A measure is seen by them as being unnecessary and uneconomical since other suitable measures are already available.

Ray and Simons (1982) challenge the validity of the hypothesised association between type A behavior pattern and CHD. In a study they conducted, no such correlation was found between type A scale (J.A.S.) and CHD. They did, however, find a positive correlation between CHD and authoritarianism (as measured by the directiveness scale). They conclude that the type A construct and the J.A.S. are far too inclusive and far too general. Positive correlations that have been found in the past between J.A.S. and CHD are due, they feel, to a single mediating component which is authoritarianism. Their opinion is that authoritarianism might lead to heart disease, since a life devoted to imposing one's will on others must be filled with much stress (which may contribute to the development of CHD).

Ray and Simons' criticism is in a way paradoxical. On the one hand they claim that the underlying passivity and dependence of the CHD patients as found by Riné and Bonami is an artifact of age. On the other hand they view authoritarianism as the only variable mediating the association between type A behaviour and CHD. A careful examination of the personality traits characteristic of the authoritarian personality (Adorno, 1950) brings a picture of an individual well described by Levinson (Adorno, 1950,p:600): "While the aggressive assertive needs of authoritarian individuals are the most conspicious ones, the dependent submissive needs are equally, if not more, important". Dependency in the high scorer on authoritarianism remains for the most time ego alien trend, which can seldom be expressed directly because it violates the image (ego ideal) of the normal

masculine man: independent, ready to take an active part in the bitter competition demanded by human nature, and eager to rise to the top of the ladder of success.

An interpretation of type A behaviour as a coping style which seeks to avoid social anxiety and nonassertiveness is suggested by Langosch et al (1982). In a research done by them on the effect of behaviour therapy on the rehabilitation of CHD patients, they performed a behaviour analysis of CHD patients. The results indicated that the patients were anxious about hurting the feelings of others or about being unfair to them. They were unable to refuse demands from others or to make their own demands. Using behaviouristic terminology, these researchers claimed that the CHD patients' behavioural assets were related to achievement. Achievement and competitive behaviours are maintained by positive and negative reinforcement. Since the level of self reinforcement. is relatively low in CHD patients, they are very dependent upon the appreciation they get from others. Thus, the CHD patients' achievement and competitive behaviour can be conceptualised as a habitual coping style which seeks to avoid social anxiety and non-assertiveness. According to the researchers, assessing a subject as a type A, does not give much information about the contingencies which control the various type A behaviours and therfore does not specify the targets for therapeutic treatment.

The various attempts to explain the type A behaviour lead to the conclusion that this overt pattern should not be seen only at its face validity. Thus, a broader understanding of the personality

variables associated with the type A behaviour pattern is needed. This is not only because of academic interest, but also because of the implications it could have for prevention and rehabilitation of CHD Patients.

If the role of psychosocial factors in the pathogenesis of CHD is demonstrated, it is important to analyse these risk factors at a level deeper than the overt, behavioural.

In connection with this, Friedman (1979) discusses the need to modifity the type A behaviour in post-infarction patients as a crucial part in their rehabiliation and prevention of a second infarction.

"Patients must receive specific and explicit instructions on how to first reevaluate their past material as well as abstract accomplishments and then to reconstruct a new mode of living in which such abstractions as Friendship, Affection and Joy will serve as the new foci for many of their activities. (Friedman 1979:p 557). He speaks about essential "Spiritual" and "Philosophical" change: "The need exists to idenfity for those patients those facets of their personality which they have lost in their increasing subservience to the frenetic demands of their type A behaviour but which they still can regain". (Friedman 1979, p: 557). Friedman claims that frequently the coronary type A patient is not aware of the fact that his years of "hurry sickness" and free floating hostility prevented him from being able to enjoy social, warm, slow paced interaction and leisure activity (such as reading books, attending theatre, concerts and so on).

However, from Friedman's formulation, the nature of the relationship between type A behaviour and personality traits is not completely clear. It appears that Friedman views behaviour as the source of a variety of personality traits. However, it might be equally reasonable to assume the opposite - that is, that particular personality traits motivate particular kinds of behaviour. In Murray's terms, the behaviour pattern exists as long as it satisfies certain needs. Making assumptions about personality variables from external behaviour only, might lead to incomplete assessment. For example, the type A looks as if he is not much interested in social interaction (unless it serves his personal goals). However, this does not allow us to conclude that he has a low affiliation need. It might well be that he is interested in other people, but is afraid of interpersonal relations, and by this style of behaviour he tries to defend himself (aggression as expressing need defendence, Murray 1938)). Similarly by trying to dominate other people, he may be attempting to assure himself that they will not leave him, that they "belong" to him.

Thus, the need to study possible personality variables associated with the type A behaviour seems important.

6. RATIONALE AND AIM OF THE PRESENT STUDY

The consistency of the findings relating type A behaviour to CHD has been demonstrated above.

The object of this study is first to examine the incidence of the type A behaviour pattern in a sample of white South African CHD patients.

While much of the research in this area has been conducted in the U.S.A. and some in other countries, no publication in this subject has yet been done in South Africa. Yet CHD is a major problem in this country. Since the cross cultural validity of the type A concept is not yet completely confirmed, it will be of relevance to study the subject in a South African context.

Extablishing the existence of the type A behaviour pattern in a South African sample of CHD patients, will add to the accumulating evidence in support of the relationship between the type A behaviour and CHD.

The second aspect of this study deals with the question of whether the type A behaviour pattern is unique to CHD or whether it can be found in other psychosomatic pathology as well.

As argued earlier, there are grounds for suspecting that the behaviour associated with the type A pattern also occur in another psychosomatic disease, namely peptic ulcer. While mainly based on clinical imporessions (Paulley, 1979), some

research (Meerhof and Wietman, 1963) demonstrated that peptic ulcer patients showed both excessively independent and aggressive behaviour (which are part of the type A pattern). Classical psychosomatic theory (Dunbar, 1947) also described similarity between the "behaviour pattern" of the CHD and the ulcer patient (although their motivations varied).

It appears that systematic research in this area has been neglected. Studies have been done comparing CHD patients to other hospitalised patients (Wardwell and Bahnson, 1973), (Gianturco et al, 1974). On the basis of these studies, Jenkins (1976) concluded that the type A behaviour pattern is rather specifically associated with CHD and is not found with more than average frequency in patients with other types of disease. There are clear limitations to this argument, since no comparison was made between CHD patients and patients suffering from the "classical psychosomatic disorders".

The third aspect of the present study refers to the relationship between the type A behaviour pattern and a variety of personality traits.

Most of the research conducted in this area has focused upon the incidence of the behaviour pattern among CHD patients and non-CHD patients and upon the physiological correlates and strength of association between the type A pattern and CHD (Jenkins, 1978).

However, it seems that the investigation of <u>psychological</u> correlates of the type A pattern has been neglected.

The classical psychosomatic literature is abundant with descriptions of "type A-like" behaviours associated with various illnesses (Dunbar, 1947 ; Arlow 1945). These descriptions were always trying to locate a core conflict or psychodynamic process which could be seen as motivating this behaviour. However, methods of research were not controlled and as a result, the validity of conclusions must be questioned. The present study will try to isolate some personality variables correlating negatively or positively with the type A measure.

The present study does not try to penetrate deeply latent personality strata. The aim is to investigate personality functioning in a broader sense than does the type A measure and in this way to give more meaning and understanding to the type A behaviour concept.

Two sets of research hypotheses were formulated: The first relates to the relative incidence of the type A behaviour pattern in local CHD patients as compared with the pattern in psychosomatic and somatic patients; while the second concerns the relationship between the type A behaviour pattern and dimensions of personality functioning.

7. HYPOTHESES

SET 1

The comparison between CHD, duodenal ulcer, asthma, non-psychosomatic and healthy controls on the type A behaviour pattern.

Ho: There is no difference between CHD, duodenal ulcer, asthma, non-psychosomatic and healthy controls on the type A behaviour.

Ha_1: CHD patients score higher than the other groups on type A behaviour and none of the others differ.

Ha_2: CHD and ulcer patients score higher on type A behaviour than the other groups, and there is no difference between CHD and ulcer patients.

SET 2

The relationship between type A behaviour pattern and personality variables.

Ho: There is no correlation between type A and personality variables.

Ha: There is a positive correlation between type A behaviour and measures of achievement, aggression, dominance, impulsiveness, endurance and succorance. There is a negative correlation between the type A behaviour pattern and measures of affiliation, play, sentience and autonomy.

8. METHOD

8.1 Research Design

Separate designs were employed to test each of the two sets of hypotheses.

Design for Set 1.

IV - Definition of group

CHD	ULCER	ASTHMA	NON-PSYCHOSOMATIC	HEALTHY

DV

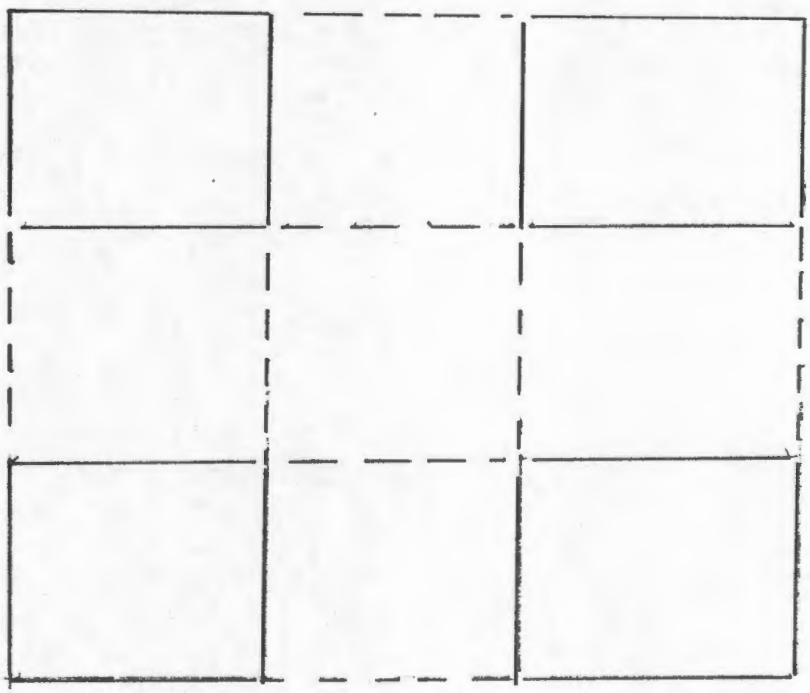
Separate comparisons using the 1-way Anova model (above) were carried out for each of the following DV's:

J.A.S. Subscales

1. AJAS - Type A scale
2. SJAS - Speed and impatience scale
3. JJAS - Job involvement scale
4. HJAS - Hard driving and competitiveness scale.

Design for set 2.

JAS scales + PRF scales (Total 26 scales).



The data from all 70 subjects in design 1 (described above) was used for this analysis.

Since the present study is exploratory in nature, the research design aims at detecting possible relationships between the two sets of scales. Therefore, in addition to identifying variables strongly correlating with each other, a method of chosing sets of predictors of JAS scores from PRF scales will be used. Statistically, the relationship between the scales will be analysed in two ways:

Firstly, all the possible correlation coefficients for pairs of scales will be screened in order to isolate personality scales (PRF scales) which correlate significantly with the type A scales (JAS). Secondly, a stepwise regression technique will be used, to obtain the best set of personality variables (PRF scales) for predicting scores on the J.A.S.

The sample consisted of 70 subjects with 14 subjects in each group.

The five diagnostic groups (IV) were defined as follows:

1) CHD: This group consisted of people who came for a routine check up after having had a first myocardial infarction. These subjects had not as yet undergone the characteristic rehabilitation programme for CHD patients and were thus chosen to avoid the possible contamination of questionnaire responses by such a programme. (This programme supplies information about the probable connection between behaviour factors and CHD).

2) Peptic ulcer: Only subjects suffering from duedenal peptic ulcers were chosen. The existence of the disease was confirmed by gastroscopy. The distinction between this form and other forms of ulcer is important since duodenal ulcer belongs to the group referred to as "stress ulcer". Different types of ulcer, probably have different etiologics (Hill 1976). For example, gastric ulcer was eliminated from the study since this form of ulcer can be induced by the use of certain drugs. A major criticism of past research on

psychosocial elements in ulcer disease focuses on the fact that most studies fail to differentiate different types of disease and consequently, results are confounded by different factors.

3) Asthma: This group consisted of patients who were diagnosed as asthma sufferers. A distinction should be made between asthma as a primary disease, and asthmatic element which can be a side effect of smoking. Only subjects who were identified as primary asthmatics were selected for the study. All the patients were attending the respiratory clinic.

4) Non-psychosomatic: This group included O.P.D. patients from the Department of Medicine, not suffering from any pathology which is thought to contain psychosomatic factors. These subjects were selected from O.P.D. cards of the Department of Medicine, and among them were patients suffering from kidney, liver and other disorders.

5) Healthy: The healthy control group was made up of individuals not known to suffer from any major pathology. These subjects were acquaintances of medical staff members in the same O.P.D. clinics. They were volunteers, willing to participate in the study programme.

The rationale for asking medical staff to obtain healthy subjects was the view that people would tend to tell their medical staff member-acquaintances about their illnesses. Thus, there is better possibility to know about these people's health state, than by

approaching subjects unknown to the researcher.

The groups were matched on the following variables:

1. Sex

   Only males were chosen for the study, due to the different vulnerability to CHD between men and women:

   The incidence of CHD among young women is lower than among men of the same age; and in the instances where women do suffer, the disease often involves other physiological disturbances.

2. Race

   A sample of white South African males was used. Due to the differing vulnerability to CHD, between racial groups, using several population groups would have required matching on this variable which would have necessitated a much bigger sample.

3. Other confounding disease contamination

   One major disease diagnosis only - IT was necessary to use subjects diagnosed as having only one major disease, to avoid results being confounded by other pathology. Thus, for example, it would be necessary to avoid using a subject suffering from both CHD and peptic ulcer.

4. Age

   The required age ranges of subjects was 39-59 years, since the JAS manual reports no correlation in this group between age and type A scores.

5. Education

   An attempt was made to specify a minimum of high school education. This requirement was preferable since the PRF was standardised on college students.

6. Social class

The subjects belonged to middle social class being professionals, clerical workers, sales and business men. This matching was needed since there are correlations between occupations and type A behaviour: some occupations tend to have higher type A scores than others (for example, sale agents) (Jenkins Manual, 1979).

It could be of interest to include all the social strata but again, this will require a sample far beyond the size available to this study.

8.2 SUBJECTS

The subjects were English speaking, white, male outpatients at a local general hospital, while healthy controls were acquaintances of doctors and nurses.

Stringent selection criteria made it impossible to match accurately on all variables. Since the present study deals with a limited population, namely hospital patients, the possible samples are small. The important medical criteria which had to be fully satisfied made it technically impossible to accurately match on the demographic criteria in the limited time available. However, an attempt to approach these criteria has been made.

The following table shows the mean and SD of age of the groups.

TABLE 1

	CHD	ULCER	ASTHMA	NON-PSYCHOSOMATIC	HEALTHY
Mean age	49.50	46.57	48.50	45.35	46.35
SD	6.52	8.32	7.39	7.08	8.09

The mean age of the whole sample was 47.25, SD = 7.45.

TABLE 2

Education level of research groups

	CHD	ULCER	ASTHMA	NON-PSYCHOSOMATIC	HEALTHY	TOTAL
Some high school	1	0	2	2	1	6(9%)
Complete high school	3	5	3	3	4	18(25%)
Trade school or technical college	4	5	2	2	3	16(23%)
University	6	4	7	7	6	30(43%)

As can be seen from table 2, 43% of the subjects had university education, 23% had trade school or technical college, 25% completed high school and less than 9% had partial high school education. It can be seen that a similar structure of education is kept within the groups, with the exception of the ulcer group which has less university graduates, but more technical college graduates than the other groups.

TABLE 3

Occupation level of research groups

OCCUPATION	CHD	ULCER	ASTHMA	NON-PSYCHOSOMATIC	HEALTHY	TOTAL
Managerial	3	2	2	2	3	12
Professional/ technical	4	2	5	6	6	23
Clerical workers	4	5	2	3	1	15
Sales agents	1	2	3	1	3	10
Small business owners	2	3	2	2	1	10
TOTAL	14	14	14	14	14	70

The categories used in the table are based on JAS Manual Jenkins (1979), and this was the original classification used in the Western collaborative group study. One occupation added here is that of "small business owners". AS can be seen from this table, two occupational categories (managerial and sales), which are characterised by relatively high type A score (Jenkins, 1979) are more or less evenly distributed in the present study's research groups.

8.3 APPARATUS

Two instruments were used in the study:

1. PRF - Personality Research Form
2. JAS - Jenkins Activity Survey.

8.3.1. PRF / DOUGLAS N. JACKSON.

The PRF is a self-report inventory. It is designed to yield a set of scores for personality traits, broadly relevant to the functioning of individuals in a wide variety of situations. It is primarily focused on areas of normal functioning, rather than on psychopathology. The starting point was the set of variables of personality originally defined by Murray (1938) These variables were developed and modified in the light of much research evidence and redefinitions prepared by Jackson. Factor analysis has suggested a convenient basis for organising the characteristics measured by the scale into a number of categories. These are:

A: Measures of impulse expression and control:

1. Impulsivity - Tendency to act on the spur of the moment.
2. Change - Liking new and different experiences.
3. Harm avoidance - Not enjoying exciting activities.
4. Order - Being neat and organised.
5. Cognitive structure - Not liking ambiguity or uncertainty.

B: Measures of orientation towards work and play:

1. Achievement - Aspiring to accomplish difficult tasks.
2. Endurance - Willingness to work long hours.
3. Play - Doing things "just for fun".

C: Measures of orientation toward direction from other people:

1. Succorance - Seeking love and protection.
2. Autonomy - Trying to break away from restraints.

D: Measures of intellectual and aesthetic orientation:

1. Understanding - Desire to understand many areas of thought.
2. Sentience - Sensitivity to many forms of experience.

E: Measures of degree of ascendancy:

1. Dominance - Attempting to control his environment.
2. Abasement - Showing a high degree of humility.

F: Measures of degree and quality of interpersonal orientation:

1. Affiliation - Enjoying being with other people.
2. Nurturance - Giving sympathy and comfort.
3. Exhibition - Wanting to be the centre of attention.
4. Social recognition - Desiring to be held in high esteem.
5. Aggression - Enjoying combat and argument.
6. Defendence - Readiness to defend self at all times.

G: Measures of test taking attitudes:

1. Desirability - Describing self in terms judged as desirable.
2. Infrequency - Responding in a pseudo random manner.

Reliability of the P.R.F.

Reliability derived from item analysis was found to be very high: .92 and the median of the lower bound Kuder Richardson formula is .91. (Jackson 1967).

Standard deviations are large, indicating good separation of subjects. In a study of the stability of test scores over time, Bentler (1964) found a range of .77 - .90 of reliability, administering the test in two different sessions, with a week's interval between them. However, conditions of administration were not equal, (making the possible raliability even higher in the case of equal conditions).

Convergent Validity:

The major P.R.F. validation studies depend heavily upon the use of trait and behaviour ratings by persons who have had natural opportunities to observe assessees. (Campbell et al 1964, Kusyszyn 1968). The validity values were better than those typically reported for personality inventories.

Discriminant Validity:

Multimethod Factor Analysis is a procedure developed by Jackson (1966) and was used to evaluate convergent and discriminant validity. Self ratings and peer ratings of traits and behavioural descriptions relevant to the traits measured by P.R.F. were obtained from subjects who answered the P.R.F. It was found that P.R.F. scales were loaded with the appropriate factors. Thus, it is possible to treat each scale as distinct and to have confidence that each is providing a unique contribution to assessment.

8.3.2 J.A.S. - JENKINS ACTIVITY SURVEY

This instrument was developed by C.D. Jenkins (1979), in the U.S.A. in an attempt to duplicate the clinical assessment of type A behaviour by using a standard psychometric procedure, and to make type A assessment accessible both to individual practitioners and to researchers conducting large scale industrial and epidemiological studies. The J.A.S. is a self-reporting questionnaire and is scored on four scales:

1. The type A scale assesses the multifactorial clinical construct of the coronary prone behaviour pattern (type A) and three factorially independent components of this broader construct:
2. Speed and impatience.
3. Job involvement
4. Hard driving and competitiveness.

RELIABILITY

Two kinds of reliability estimates were computed for the test:

1. Internal consistency
2. Test-retest.

The internal consistency reliability coefficient for the type A scale was .83 in one approach and .85 in another.

For the test-retest, most of the observed coefficients fall between .60 and .70 for retest intervals from 1 - 14 years. (Jenkins 1979).

VALIDITY

The first evidence for the test validity is the agreement between scores on J.A.S. and interviewer ratings on the basis of a structured interview (Jenkins, Zyzanski, Rosenman 1971).

Additonal evidence came from predictive studies (Jenkins et al 1979), that have further established that individuals with higher J.A.S. scores, are more likely to sustain heart attacks.

Other studies (Jenkins, Zyzanski, Rosenman, Cleveland 1971) (Jenkins et al 1976), have linked type A behaviour as measured by J.A.S. to the likelihood of recurrent myocardial infarctions, and to the severity of atherosclerosis (Zyzanski et al 1976). The construct validity of the J.A.S. was studied by Ditto (1982). In a research on college students, he found that type A's (as measured by the J.A.S.) did actually work harder in college and spent less time on social relations and leisure activities. Thus, the behaviour displayed in the J.A.S. questionnaire was consistent with the actual behaviour, supporting in this way, the construst validity of the J.A.S.

8.4 PROCEDURE

Medical doctors and nurses in charge of the relevant out-patients departments (O.P.D.) were asked to scrutinise their attendance register for patients who would fulfil the combination of selection criteria. Each patient thus identified would be contacted by letter. The letter informed the subject that research was being conducted in the field of disease and behaviour (see appendix) and requested his participation. The specific disease from which the patient suffered was not mentioned at all in the communication. This was done in order to minimize the effect of popularly accepted views concerning specific personality and behaviour style on the questionnaire responses.

Patients were individually tested on attendance at the relevant clinic. The questionnaires were given to the patients by the researcher or by the nurse, without any communication about the study's aims, except that mentioned in the letter.

The healthy controls completed their questionnaires at home, under the supervision of the researcher.

The original design included 20 subjects in each group. However, 30% of the subjects dropped from the study: several subjects that agreed to take part in the research decided not to do so, when the "actual event" took place. Some of the subjects started to answer the questionnaires but complained of being tired and wished not to continue. Three of the CHD patients

turned out to have suffered from ulcer previously and were thus eliminated from the study. It transpired that two asthmatic patients had been angina suffers, although this had not been diagnosed at the selection of subjects.

The gathering of data took about nine months. This long period could be explained by the difficulty of finding subjects who met all the criteria. One of the reasons for this is the fact that many of the middle class people see private practitioners and are referred to the hospital only when hospitalization is required.

Scoring

The scoring was done by the researcher. A partial attempt was made to provide a blind procedure. This was not entirely possible since the researcher supervised the filling in of the questionnaire as well as doing the scoring thereof. However, when scoring, the questionnaires from several clinics were randomised, thus minimising the possibility of subjective influence on the results. In view of the objective nature of the instruments used, this was thought to be an adequate blind procedure.

9. RESULTS

9.1 Analysis of Design

The statistical analysis was based on the acceptance of the following conditions:

1. Scores may be treated as though they are observations on a continuous variable.
2. Scores on all the scales would tend to be normally distributed, with individual means and variances. (Jenkins, J.A.S. Manual 1979; Jackson, P.R.F. Manual 1967).

In many of the tables that follow tail probabilities are presented since they are more instructive than is the consistent use of fixed level of significance. Low tail values indicate the probability of the obtained F values being due to chance alone.

Analysis of variance of each variable was conducted using program P.7.D. of the B.M.D.P. statistical package (Dixon, 1981). This analysis compared the research group on each of the J.A.S. scales separately.

Since the present study is exploratory in nature, a lower level of significance ($p<.10$) was adopted. Trends that were indicated at this level of significance can be seen as an indication for further research.

The statistical analysis of the comparison between groups on the JAS scales was conducted in three stages:

1. One way analysis of variance of each variable was conducted using program P.7.D. of the B.M.D.P. statistical package (Dixon, 1981). This analysis compared the research groups on each of the J.A.S. scales separately. The aim of this analysis was to test hypothesis 1 which refers to unspecified differences between the groups on the type A scale.

2. Only those scales which were found significant: A.J.A.S. ($p<.10$) and S.J.A.S. ($p<.05$) were subject to further analysis. Both J.J.A.S. (job involvement scale) and H.J.A.S. (hard driving scale) were not further analysed. The method used for this analysis is The Tukey studentized range method (Miller, 1966), since it is designed for pairwise comparisons of means. When all the group sizes are equal (as in this instance with 14 subjects per group) it is possible to derive the shortest interval for pairwise comparisons which is applicable both before and after looking at the data. This interval is applied to the set of ordered means and although it compares adjacent ordered means, it also allows for all possible contrasts (even contrasts of non adjacent group means).
   The formula for calculating the interval width is:

$$2\,q_{a,n-a}\,\frac{S}{\sqrt{n}} = 2q\,\frac{0.05}{5.65}\cdot\frac{5}{\sqrt{14}} = 2.127S\ (p<.05)$$

Where S is the standard deviation obtained from the Anova table.

On this basis, any set of means can be investigated and the observed interval is compared to the tabulated value which indicates where significant intervals exist ($p<.05$) between means.

A vertical line between means in the table indicates where there are significant intervals. Any pair of groups with means on either side of a vertical line are then declared to be significantly different ($p<.05$). This test is conservative in that it ignores the fact that some group contrasts may have been singled out for hypothesis testing. It was not possible to obtain tabular values of q for the $p<.10$ level. However, dotted vertical lines indicate differences which might have been relevant had there been access to such tables.

3. Since the Tukey range method does not test pairwise comparisons stipulated a priori, and the present study's hypothesis concern the relationships between CHD and ulcer to the other groups, a method for simultaneous statistical inference was used. The method - Bonferoni T intervals (Miller, 1966: 67) compares linear combinations of the group means stipulated a priori.

   For the purpose of clear presentation, the hypotheses tested by this method will now be presented.

1. Ho The scores of CHD patients do not differ from those of other patients.

   Ha Differences do occur.

2. Ho CHD and ulcer patients do not differ from the remaining subjects.

   Ha Differences do occur.

The significance level of the differences is calculated by comparing the derived T statistics with the tabulated value. The tabulated values for the different levels of significance are as follows:

$$tv_{\alpha/2k} = t_{65}^{0.01/4} \leq 2.92 \quad (p<.01)$$

$$tv_{\alpha/2k} = t_{65}^{0.05/4} \leq 2.58 \quad (p<.05)$$

$$tv_{\alpha/2k} = t_{65}^{0.10/4} \leq 2.00 \quad (p<.10)$$

Each of the four scales: A.J.A.S. (type A scale), S.J.A.S. (speed and impatience scale), J.J.A.S. (job involvement scale) and H.J.A.S. (hard driving scale) will now be presented separately.

A.J.A.S. - The type A scale

TABLE 4: Means and Sd's of the groups on A.J.A.S.

	CHD	ULCER	ASTHMA	NON-PSYCHOSOMATIC	HEALTHY	TOTAL
$\bar{x}$	287.28	270.57	223.71	224.50	214.71	244.16
Sd	78.97	71.84	58.41	101.49	89.97	84.34

TABLE 5: Anova summary table for A.J.A.S.

Source	Sum of squares	df	Mean square	F value	tail probability
Between groups	59205.76	4	14801.44	2.23	0.08 ($p<.10$)
Within groups	431677.50	65	6641.19		
Total	490883	69			

TABLE 6: Ranked scale means with Tukey groupings for the A.J.A.S.

$\bar{x}$ = 214.71	$\bar{x}$ = 223.21	$\bar{x}$ = 224.50	$\bar{x}$ = 270.57	$\bar{x}$ = 287.28
Healthy	Asthma	Non-psychosomatic	Ulcer	CHD

From the table it can be seen that a difference occurs between CHD and healthy, asthma and non-psychosomatic groups, as well as between ulcer group and healthy, asthma and non-psychosomatic groups.

As was mentioned before, an absence of $p<.10$ tables for the Tukey method does not allow a conclusive statement about the significance of this difference. However, the strong trend indicated here, will be corroborated by the findings of the method which tests group differences stipulated a priori (Bonferoni t intervals). The t statistics obtained by this method will now be presented:

1) The difference between CHD and all the other groups:

$$t = 53.91 \div \sqrt{6641.19 \frac{.5}{56}} = 2.21 \quad (p<.10)$$

2) The difference between CHD + ulcer and all the other groups:

$$t = 57.90 \div \sqrt{6641.19 \frac{.5}{84}} = 2.91 \quad (p<.05)$$

The meaning of this data is that the Ho is rejected in both cases. However, the hypothesis that concerns the differences between CHD and the other groups is accepted at $p \leq .10$ only. When combining the CHD and the ulcer group, and comparing CHD + ulcer to the other groups, the accepted difference is significant at the $p<.05$ level. These results thus corroborate the expectations expressed in the hypotheses and

also supercede the tentative conclusions for the A.J.A.S. scale under the Tukey studentized ranked method.

SJAS - The speed and impatience scale

TABLE 7: Means and Sd's of the groups on SJAS

	CHD	Ulcer	Asthma	Non-psychosomatic	Healthy	Total
$\bar{x}$	258.14	212.78	191.35	160.42	184.00	201.34
Sd	72.42	66.69	83.02	56.95	73.89	76.60

TABLE 8: Anova Summary Table for the SJAS

Source	Sum of squares	df	Mean square	F value	Tail probability
Between groups	76043.05	4	19010.76	3.76	(p<.01) .0082
Within groups	328764.71	65	5057.91		
Total	404807.76	69			

TABLE 9: Ranked scale means with Tukey groupings for the SJAS

			p<.10		p<.05
$\bar{x}$ = 160.4	$\bar{x}$ = 184.00	$\bar{x}$ = 191.4	:	$\bar{x}$ = 212.8	$\bar{x}$ = 258.1
Non-psychosomatic	Healthy	Asthma	:	Ulcer	CHD

According to this table, CHD group is different from all the other groups at the $p<.05$ level. However, it seems that ulcer group is different from asthma, non-psychosomatic and healthy groups on the speed and impatience scale at the $p<.10$ level.

BONFERONI T INTERVALS FOR THE SJAS

1. The difference between CHD and all the other groups:

$$t = 71 \div \sqrt{5057.92 \cdot \frac{5}{56}} = 3.34 \quad (p<.01)$$

2. The difference between CHD + ulcer and all the other groups:

$$t = 56.8 \div \sqrt{5057.92 \cdot \frac{5}{84}} = 3.28 \quad (p<.01)$$

According to these calculations, both hypotheses (that there is a difference between CHD and other groups; and that there is a difference between CHD + ulcer and other groups) are accepted at the $p<.01$ level. This finding seems paradoxical.

The results indicate that a strong case exists for saying that CHD Patients differ from all the others; while at the same time indicating that both CHD and ulcer patients differ from the others (both at $p<.01$). The interpretation of these results suggests that there is insufficient evidence to place CHD and ulcer subjects in two distinct sets separate from the remainder. On the other hand, there is clear evidence of at least two sets, one of which may be CHD alone or may be CHD and ulcer. On the basis of this data, the choice is optional. Thus, if one choses to discuss CHD and ulcer patients

as one set, distinct from the rest, such a discussion is justified on the basis of the data.

The tests used are conservative, so that for the stipulated hypotheses, it is possible to conclude that there are differences between the groups at the stated significance level, or better levels.

JJAS - The Job Involvement Scale of JAS

TABLE 10: Means and Sd's of the groups on JJAS

	CHD	Ulcer	Asthma	Non-psychosomatic	Healthy	Total
$\bar{x}$	240.78	221.72	207.72	200.57	223.00	218.64
Sd	53.01	55.06	50.82	56.19	70.48	57.58

TABLE 11: Anova Summary Table for the JJAS

Source	Sum of squares	df	Mean square	F value	Tail probability
					(p>.10)
Between groups	13571.42	4	3392.85	1.02	.4013
Within groups	215226.64	65	3311.17		
Total	228798.07	69			

Since the F value of the Job involvement scale was found not significant, further analysis was not performed.

HJAS - The Hard Driving Scale of the JAS

TABLE 12: Means and Sd's of the groups on HJAS

	CHD	Ulcer	Asthma	Non-psychosomatic	Healthy	Total
$\bar{x}$	135.35	144.57	119.78	124.57	123.21	129.50
Sd	28.08	31.19	24.85	31.20	31.55	30.02

TABLE 13: Anova Summary Table for the HJAS

Source	Sum of squares	df	Mean square	F value	Tail probability
Between groups	5874.71	4	1468.67	1.69	(p>.10) .16
Within groups	56546.78	65	869.95		
Total	62421.79	69			

Since the hard driving scale was found insignificant, the statistical analysis ended for this scale, at this point.

9.2 Statistical analysis for design 2

The interrelationships of JAS and PRF scores, were investigated in three ways:
Firstly, all the correlation coefficients for pairs of scales were screened.
Secondly, a stepwise regression technique was used to chose a good subset of predictors of JAS scales from PRF scales.
Thirdly, the best subset regression technique (which does not take into account F values) yielded the best conmbinations of variables from the PRF, predicting the JAS scales.
These three methods will now be presented.

9.2.1. Correlation coefficients for pairs of scales.

The number of coefficients for pairs of scales was:

$26.25 \;/\; 2 = 325$

pairs ÷ double counts correlation coefficients.

In such a large set of correlation coefficients it is possible that a large number may display apparent significance due to chance causes alone, even if all the true correlations are zero correlations.

It is therefore not appropriate to apply the critical values of r (for 68 degrees of freedom). Instead, a conservative screening procedure may be constructed by assuming correlation coefficients r with $|r| \geq 0.40$ show an indication of possible interesting

correlations.

Under the zero correlation hypotheses, with a cut off value of 0.40, the expected number of significant correlation coefficients occurring by chance alone, would be less than one. Applying this cut-off value established 36 pairs of variates with highly significant correlation coefficients.

These will be presented in Table 14.

TABLE 14: Strongly related bivariate pairs (lr/>0.40, df = 68)

AJAS (type A scale)	HJAS (.64) (Hard driving)	SJAS (.60) (Speed and impatience)	AC (.46) (Achievement)	DO (.43) (Dominance)	AG (.40) (Aggression)
SJAS (speed and impatience)	AG (.60) (Aggression)	AJAS (.59) (Type A scale)			
JJAS (Job involvement)	DO (.47) (Dominance)	DY (.44) (Desirability)	AC (.42) (Achievement)	EX (.40) (Exhibition)	
HJAS (Hard driving)	AJAS (.64) (Type A scale)				
AB (Abasement)					
AC (Achievement)	EN (.66) (Endurance)	AJAS (.46) (Type A scale)	JJAS (.42) (Job involvement)		
AF (Affiliation)	NU (.47) (Nurturance)	SR (.45) (Social recognition)	AU (-.44) (Autonomy)		
AG (Aggression)	DE (.62) (Defendence)	SJAS (.61) (Speed and impatience)	DO (.43) (Dominance)	AJAS (.40) (Type A scale)	
AU (Autonomy)	SU (-.60) (Succorance)	AF (-.44) (Affiliation)	SR (-.42) (Social recognition)	CH (.42) (Change)	HA (-.41) (Harmavoidance)
CH (Change)	HA (-.55) (Harm avoidance)	IM (.47) (Impulsivity)	AU (.42) (Autonomy)		

CS (Cognitive structure)	OR (.60) (Order)	IM (-.58) (Impulsivity)	HA (.45) (Harm avoidance)	
DE (Defendence)	AG (.62) (Aggression)	DO (.40) (Dominance)		
DO (Dominance)	EX (.56) (Exhibition)	JJAS (.47) (Job involvement)	AJAS (.43) (Type A)	AG(.43) (Aggression)	DE (.40) (Defendence)	DY (.40) (Desirability)
EN (Endurance)	AC (.66) (Achievement)			
EX (Exhibition)	DO (.56) (Dominance)	IM (.48) (Impulsivity)	PL (.48) (Play)	SR (.48) (Social recognition)	JJAS (.40) (Job involvement)
HA (Harm avoidance)	CH(-.55) (Change)	IM(-.49) (Impulsivity)	CS (.45) (Cognitive structure)	OR(.43) (Order)	AU (-.41) (Autonomy)
IM (Impulsivity)	CS (-.49) (Cognitive structure)	HA (-.49) (Harm avoidance)	EX (.48) (Exhibition)	CH(.47) (Change)	PL (.45) (Play)
NU (Nurturance)	AF (.47) (Affiliation)			
OR (Order)	CS (.60) (Cognitive structure)	HA (.43) (Harm avoidance)		
PL (Play)	EX (.48) (Exhibition)	IM (.45) (Impulsivity)	AF (.40) (Afflilation)	
SE (Sentience)	UN (.43) (Understanding)			

SR (Social recognition)	EX (.47) (Exhibition)	AF (.45) (Affiliation)	SU (.43) (Succorance)	AU (-.42) (Autonomy)
SU (Succorance)	AU (-.60) (Autonomy)	SR (.43) (Social recognition)		
UN (Understanding)	SE (.43) (Sentience)			
IN (Infrequency)				
DY (Desirability)	JJAS (.47) (Job involvement)	DO (.40) (Dominance)		

From this table it is clear that the type A scale is strongly correlated with the scales Speed and Impatience and Hard Driving of the JAS, and with the scales Achievement, Dominance and aggression of the PRF.

The Speed and Impatience scale (SJAS) is strongly correlated with Aggression (PRF) and with type A scale (JAS).

The Job Involvement scale is strongly correlated with Achievement, Dominance, Exhibition and Desirability - all PRF scales.

The Hard Driving scale of the JAS is strongly correlated with the type A scale (AJAS).

9.2.2 The stepwise choice of a good set of predictors.

The programme P2R of the B.M.D.P. package (Dixon, 1981) allows the stepwise choice of a good set of predictors, subject to the choice of two defining F values, to the inclusion and exclusion of variables in the set finally chosen. In all cases, these values were taken to be:

F in = 4.0

F out = 3.9

For these values of F, stepwise regression produces the following set:

TABLE 15: The stepwise regression set for prediction of JAS scales.

	1st	2nd	3rd	4th	R	R^2
Type A scale	Achievement	Aggression			0.56	0.34
Speed and impatience	Aggression	Impulsivity			0.65	0.42
Job involvement	Dominance	Understanding	Desirability		0.60	0.36
Hard driving	Achievement	Succorance	Aggression	Play*	0.60	0.36

According to this table, Achievement and Aggression are the best predictors of the type A scale. Aggression and Impulsivity are the best predictors of the Speed and Impatience scale.

The scale Job Involvement of the JAS is best predicted by the scales: Dominance, Understanding and Desirability of the PRF. The best predictors of the Hard Driving scale are Achievement, Succorance, Aggression, and Play (negatively correlated).

Since this research is exploratory in nautre, a further analysis was done, in an attempt to avoid the possibility of being narrowly restricted by the F limits set by the stepwise regression technique.

9.2.3 Mallow Cp best sets.

The regression programme P9R of the B.M.D.P. series (Dixon, 1981) enables us to examine the output of all the possible sets without restricting F limits. The criterion adopted is Mallow Cp (Hocking, 1976) and the best set is the one which has the lowest Cp value. Large Cp values indicate that important variables are omitted from the set, and Cp values close to p (the number of predictors in the set) indicate acceptable sets.

For each JAS scale, the best set of each size will be presented, smaller than the optimal set which is the last and largest set.

TABLE 16: Best set regression for the type A scale

(* Negative coefficient)

AJAS (Type A scale)	P	Cp	R	R^2
Achievement	1	19.25	0.46	0.21
Achievement, Aggression	2	7.08	0.58	0.34
Achievement, Aggression, Play*	3	5.57	0.61	0.37
Achievement, Aggression, Exhibition, Play*	4	0.21	0.66	0.44
Achievement, Aggression, Exhibition, Nurturance, Play*	5	0.50	0.68	0.46
Achievement, Affiliation*, Aggression, Autonomy*, Exhibition, Play*	6	0.10	0.69	0.48

From this table, it can be seen that the type A score of the JAS can be best predicted from the PRF scores on the following set of variables:

Achievement, Affiliation (negatively correlated), Aggression, Autonomy (negatively correlated), Exhibition and Play (negatively correlated).

TABLE 17: Best set regression for the Speed and Impatience scale (* Negative coefficient).

SJAS (Speed and Impatience scale	P	Cp	R	R^2
Aggression	1	2.59	0.61	0.37
Aggression, Impulsivity	2	-1.05	0.65	0.42
Aggression, Impulsivity, Play*	3	-2.55	0.67	0.45
Aggression, Change*, Impulsivity, Social recognition	4	-4.19	0.69	0.49
Aggression, Change*, Endurance, Impulsivity, Nurturance*	5	-4.55	0.71	0.51

From this table it can be seen that the Speed and Impatience scale scores of the JAS can be best predicted from the following set of scores on the PRF scales:
Aggression, Change (negatively correlated), Endurance, Impulsivity, and Nurturance (negatively correlated).

TABLE 18: Best set regression for the Job Involvement scale (JJAS) (*Negative coefficient).

The Job Involvement scale (JJAS)	P	Cp	R	R^2
Dominance	1	8.82	0.46	0.22
Dominance, Understanding	2	1.44	0.56	0.32
Dominance, Understanding, Desirability	3	-0.99	0.61	0.37
Dominance, Impulsivity, Understanding, Desirability	4	-2.43	0.63	0.40
Cognitive structure, Dominance, Impulsivity, Understanding, Desirability.	5	-2.92	0.65	0.43

From table 18 it can be seen that the Job Involvement scale scores of the JAS, can be best predicted by the following set of the PRF scales:

Cognitive structure, Dominance, Impulsivity, Understanding and Desirability.

TABLE 19: Best set regression for the HJAS (Hard Driving scale) (*Negative coefficient).

HJAS (Hard Driving scale)	P	Cp	R	R^2
Achievement	1	13.77	0.36	0.13
Achievement, Succorance	2	8.90	0.45	0.20
Achievement, Aggression, Succorance	3	3.37	0.53	0.28
Achievement, Aggression, Play*, Succorance	4	-1.38	0.60	0.36
Achievement, Aggression, Play*, Succorance, Understanding*	5	-2.81	0.63	0.40
Achievement, Aggression, Dominance, Nurturance*, Play*, Succorance.	6	-2.76	0.65	0.42
Achievement, Aggression, Dominance, Nurturance*, Play*, Succorance, Understanding*	7	-3.28	0.66	0.44

This table shows that the Hard Driving scale scores of the JAS, can be best predicted from the following set of scores of the PRF scales:
Achievement, Aggression, Dominance, Nurturance (negatively correlated), Play (negatively correlated), Succorance and Understanding (negatively correlated).

In essence, the statistical approach adopted in this study should be seen as exploratory. The results and conclusions of this statistical analysis do not constitute statistical verification of some postulated hypotheses, but do, in many cases arise from considerable statistical evidence in their support.

ANOMALOUS DATA

It is mathematically possible that apparent relationships between variables are indicated because of the presence of a small number of observed values that are atypical or anomalous in some way. In all the foregoing analyses and tabulations, the set of computer programmes used made it possible to performe some preliminary checks on possible effects of the single most extreme observation in each analysis. None of these were found to constitute any problem requiring further analysis.

10. DISCUSSION

10.1 The interpretation of results in Set 1.

The results of the present study, partially support the expected relationship between CHD and type A behaviour pattern. The research hypotheses are confirmed for two of the four type A behaviour scales. The two scales found significant in the 1 way Anova were the type A scale (AJAS), and the speed and impatience scale (SJAS). These two scales were then subject to further analysis testing for differences between the CHD + ulcer groups and the other groups.

In the case of the type A scale, there is clear evidence that CHD and ulcer patients are different from all the other groups ($p < .05$). This significance is higher than the significance obtained by the same test (Bonferoni t intervals) when comparing the CHD group alone to the other groups. The strong evidence for CHD and ulcer patients to belong to the same "set" on the type A scale, does not similarly exist in the case of the speed and impatience scale. Although there is clear evidence to indicate a significant difference between the CHD and the other groups on this variable ($p < .05$ according to Tukey; $p < .01$ according to Bonferoni test), The ulcer group seems to be "in-between". One cannot therefore place the ulcer group decisively together with the CHD group. The interpretation of these findings will be considered later.

On the remaining scales, job involvement and hard driving scales

The results show that there is no significant difference between the groups.

The inconsistency in significance between the JAS scales in the present study is not surprising since the three scales: Speed and impatience (SJAS), Job involvement (JJAS) and Hard driving (HJAS) are fairly independent factors, although they all correlate positively with the general type A scale (AJAS). An analysis of the intercorrelations among JAS scales (Jenkins, 1979) suggests that the three factors scores of the JAS make relatively independent contributions to the assessment of the type A tendencies. A similar analysis done in the present study (see appendix) shows a similar pattern.

The theoretical formulation of the type A concept concurs with this finding: A person need not score highly on all the type A behaviour aspects in order to be defined as a type A person (Jenkins, Gentry 1979).

The Job involvement scale yielded the lowest F value ($F = 1.02$, $p > .40$). This finding of no significant difference between CHD patients and other patients on job involvement contradicts previous studies which found vocational dedication to be characteristic of CHD patients (Wynn, 1967; Bruhn et al 1974; Russek 1967; and Thiel et al 1973).

However, the association of job involvement with CHD can be questioned: Since the reported correlation between the job involvement scale and type A scale in the JAS mannual (Jenkins 1979)is not very high (.42) and the correlation found in the

present study is even lower (.19) (see appendix E), this variable can be seen as a relatively independent factor of the type A pattern. The question that should be asked is whether job involvement as an isolated variable is related to CHD. The relationship that has been found in the past might have been due to confounding variables, correlating with job involvement in those studies and not be a true representation. It might be reasonable to speculate that job involvement that is not associated with aggression but has other sources, such as intellectual interest, would not necessarily increase the risk of developing a disease. As was earlier discussed, intense emotional arousal strains the individual's adaptive capacity and the person is liable to exhibit a state of general susceptibility to disease (Lipowski, 1973). The emotional arousal refers to unpleasant feelings associated with the subjective meaning of a certain information input. Thus, job involvement does not necessarily have to be associated with such "unpleasant feelings".

As it happens, the sample dealt with in the present study consisted of middle social class people. It is reasonable to assume that these people tend towards a relatively high degree of job involvement. McKinely (1967) claims that people who belong to upper middle class are carreer minded, and see hard work as a means of achieving social status. The lower middle class is also work orientated, although this orientation is motivated by a wish to conform, to do the "right" things. These two social strata, differ from the upper social class and the lower social class. The upper

social class does not need hard work as a means for achieving status, and the lower social class feels that "hard work leads to nowhere". It appears that the quality of the emotions associated with job involvement probably determine whether this variable becomes a risk factor for disease.

In contrast to outcomes of some earlier studies (van der Valk and Groen 1967; Bonami and Rimé 1972) it was found that hard driving was not significantly different between the groups in the present study. A similar explanation to that above can apply to this finding.

Hard driving as such can be accompanied by feelings of pleasure. Murray (1938) describes"achievement pleasure" as "the conquest of oppositions to the will" (p 91). The subject experiencing this emotion is one who welcomes obstacles (physical or mental), selects the hardest tasks - things that demand great exertion and courage -, in order to experience the elation of mastering them. The more difficult the task, the greater the experience of pleasure if he is able to accomplish it.

The person described in the literature as "type A" seems also to be motivated by this wish to overcome difficult obstacles, to compete and win. This kind of person, according to Murray will suffer from disquieting inferiority feelings after repeated failures.

This view concurs with the view expressed by Bruhn et al (1974)

who claimed that CHD disproportionately affects those whose striving is frustrated and seemingly unrewarded. Bruhn et al described what they called: "Sysiphus Pattern of behaviour". This pattern characterised an effort-orientated person who strives against odds, but with very little sense of accomplishment or satisfaction. Like the legendary Greek giant, Sisyphus, who was forced by the gods he had offended to push a large stone up a hill but the next day he always found that it had rolled back to where it had started. In their study, Bruhn et al found that there was an excess mortality rate from heart disease for those subjects in the myocardial group showing the Sisyphus pattern and extreme type A behaviour with which it appeared to be correlated(type A was rated by means of the structured interview, while Sisyphus pattern was rated by a psychiatric interview).

Thus chronic frustrations cause the ego defences to become more exaggerated and less effective and lead to the emotional drain that precipitates myocardial infarction and often, sudden death. One can assume therefore, that hard driving which is not chronically frustrated, will not necessarily have the specific hypothesized pathogenetic effect.

The speed and impatience scale shows the biggest difference between CHD and the other groups ($p < .05$). This factor deals with the time urgency revealed in the style of behaviour of the type A person. Those scoring high on this factor tend to eat very rapidly, become impatient with the conversation of others, hurry other people along, have strong tempers and become irritated easily. From the present study's results, it can therefore be concluded that impulsive-aggressive behaviour tends to characterise the CHD patients more than the other diagnostic groups and healthy controls. This finding supports other studies which confirmed the restlessness and impatience components of the CHD patient behaviour (Brojek et al 1966; Wardwell et al 1968). Other studies investigated the hostility of the coronary patients and found that they became more hostile when slowed down then did a matched control group (Theorell and Rahe 1972). The speed and impatience scale specifically refers to this kind of hostility - hostility evoked in situations blocking or slowing down the activity of the type A person.

Impulsivity as an underlying trait in the coronary personality was already studied by Rimé and Bonami (1979). However, according to their results, this trait cannot be displayed in questionnaires given to CHD patients, since it can be revealed only by deeper penetration to the covert personality level. However, Bonami and Rimé also failed to find any evidence of the type A behaviour pattern in CHD patients by means of questionnaires, although they did find such evidence

through clinical interviews. They claim that no questionnaire can adequately measure the type A behaviour pattern. The other possibility which they did not consider is that their questionnaire may have been inadequate for measuring this specific behaviour pattern. The present study, in line with many other studies found that CHD patients tend to score higher on the speed and impatience scale, thus contributing to the accumulating evidence in support of the association between CHD and this specific factor of the type A pattern.

The important finding in the comparison between CHD group and the other research groups is undoubtedly the confirmation of the hypothesis that CHD and ulcer patients show a higher incidence of type A behaviour.

As was mentioned above, the specificity of the type A behaviour pattern to CHD was not established through systematic research: No comparison has been made between CHD and specific categories of the so-called "Psychosomatic diseases".

The finding that CHD and ulcer patients score higher on the type A behaviour measure, supports early psychosomatic theory (Dunbar, 1947) that acknowledged similarity in the behaviour pattern of these two categories, although a difference in the underlying forces which motivate the similar behaviours was emphasized. Later clinical observations (Paulley 1979) also described the ulcer patient being characterised by type A behaviour pattern. Paulley notes that during his clinical practice, he often observed that patients suffering from CHD also

showed scars of an ulcer operation. Since he observed in these patients a high frequency of type A behaviour, he concluded that the same behavioural risk factor is operating in both disturbances. Although the present results do not allow a decisive conclusion that there is no difference between CHD and ulcer groups on the type A scale and the speed and impatience scale, there is a definite indication of the trend for the ulcer and CHD groups being significantly higher than all the other research groups on these variables.

Summing up the results of set 1, two important points should be considered:
The first one is that among all the type A factors, the factor of speed and impatience was found to be the most significant in the difference between CHD group and the other groups. The speculation about the physiological mechanisms mediating the association between behaviour and CHD, makes this finding acceptable. The speed and impatience factor is the only one among the factors which is essentially associated with emotions defined as "unpleasant".

The two other factors, the hard driving factor and the job involvement factor, are not necessarily loaded with these "negative" emotions. When rewarded, they might even be associated with "positive" emotions like "achievement pleasure" discussed by Murray, (Murray 1938). Thus, these two factors should not be seen as essentially pathogenetic.

The other important point raised by the present results is that a higher incidence of type A behaviour(as measured by the type A scale) can be found in duodenal ulcer patients as well as in CHD patients.

This finding needs further support from studies using larger samples and a bigger variety of other psychosomatic pathologies, but the existence of such tendency, does not justify the specifying of the type A behaviour as a unique and specific risk factor for CHD.

A second limitation to the present study is its retrospective nature. In this case, the type A variable was investigated on groups previously diagnosed as suffering from specific illness. Therefore, it can be stated only that there is a relationahip between CHD and type A behaviour, and ulcer and type A behaviour, but no causal relationship can be established. In order to establish a causal link, a prospective (predictive) study is needed. However, since evidence from such studies (prospective) supported the view that the type A behaviour pattern is a risk factor in the development of CHD (Rosenman et al 1964), it would be reasonable to see the findings of this study as contributory evidence. Although no prospective studies were done on ulcer and type A behaviour, the same argument is applicable to the relationship found.

A predictive design, in which an attempt will be made to predict CHD and other psychosomatic disorders in a group of people known to be healthy is recommended for the future.

In such a design the judgment of behaviour will preceed the diagnosing of the disease and thus, the confounding effect of disease factors on behaviour and personality variables will be minimized. Such a study needs to be a longitudinal project, requiring years of follow up periods.

10.2 The interpretation of results in set 2.

The results of the analysis of correlations between JAS scales and PRF scales generally supports the hypothesis that there exists a relationship between some of the PRF and JAS scales. This is important since it shows that the type A behaviour pattern does correlate with enduring personality traits.

The Type A scale

With a cut-off value of $|r| > 0.40$ several expected relationships appear. As can be seen from table 14 , the type A scale strongly correlates with achievement (.46), dominance (.44) and aggression (.40), thus suggesting the situational components of the type A behaviour to be anchored in more continuous personality structure.

According to Murray (1938), need achievement may accompany any other need, and it can be easily and naturally fused with every other need. Murray claims that it is possible that need achievement is the dominant psychogenic need and that in most cases this need may be subsidiary to an inhibited need for recognition. The description of high scorer on achievement is as follows: "(He) aspires to accomplish difficult task, maintains high standards and is willing to work toward distant goals; responds positively to competition; willing to put forth effort to attain excellence". (Jackson 1967, 6).

According to Murray, need achievement is often called "the will to power". The dominance need embodies the wish to control one human's environment. The description of the high scorer on dominance is as follows: "He attempts to control his environments and to influence or direct other people. (He) expresses opinions forcefully, enjoys the role of leader and may assume it spontaneously". According to Murray, the most common fusion of this need is with that of achievement. The dominance need may also be subsidiary to the need achievement. These two needs, achievement and dominance seem to be an expression of the will to power. One can assume that they interact with each other: on the one hand, the person tries to dominate others in order to satisfy his need for achievement; on the other hand, he may strive for achievements and thus to control his environment.

The aggression need according to Murray "operates to supplement dominance when the latter is insufficient" (1938, p 151). Aggression is aroused by opposition, annoyances, attacks and insults.

The high scorer on aggression is described as follows: "(He) enjoys combat and argument, easily annoyed, sometimes willing to hurt people to get his way; may seek to "get even" with people whom he percieves as having harmed him". (Jackson 1967 : 6)

The strong correlations found between achievement, dominance, and aggression to the type A scale (AJAS) agrees with the interpretation of seeing the type A behaviour as a way of controlling the environment (Glass et al, 1974).

According to these researchers the type A person in situations that challenge his belief in personal control, attempts to regain a sense of mastery of the environment by this pattern of excessive drive, intolerance of delay, heightened work pace, and feeling of high pressure.

Another aspect of the needs aggression and dominance emerges from looking at the PRF scales' intercorrelations. The interesting pattern is that both aggression and dominance highly correlate with need "defendence" (.62) and (.41) respectively. The definition of the high scores on defendence, as measured by the PRF, is as follows: "(He) readily suspects that people mean him harm, or are against him; is ready to defend himself at all times; takes offence easily; and does not accept criticism readily" (Jackson, 1967). The emotions that accompany the need "defendence" are guilt feelings, inferiority feelings, anxiety and indignation. Thus defendence may be exaggerated defence mechanism for guilt feelings (Murray, 1938).

The strong relationship found between aggression and defendence and dominance and defendence may suggest that this outwardly confident and strong image of the type A behaviour is likely to contain elements of insecurity and inferiority which the aggressive and dominant behaviour aims to diminish. This view of the type A behaviour supports Dunbar's (1947) theory which refers to the specific behaviour maintained by CHD and ulcer patients. Dunbar describes the CHD patient as having seemingly

strong defences: these defences tend however, to collapse when the setting of a highly crystallized life role tends to break. Below this facade, the ambitious, strong person is actually insecure and brittle.

The combination of achievement, dominance and aggression which correlate highly with type A behaviour, supports Ray and Simon's view that the type A concept embodies authoritarionism, these variables being important characteristics of the authoritarian personality (Adorno, 1950). However, instead of a definitive conclusion, which does not seem to have a solid basis, it would be more appropriate to say that the type A personality has some authoritarian elements. Further support for this statement comes from the finding that the variable autonomy does not seem to be correlated with the type A scale (.13). This means that the outwardly ambitious dominant person is not necessarily independent and self-reliant. This conclusion is based on the list of defining trait adjectives of autonomy: "unmanageable, free, self-reliant, independent, autonomous, rebellious, unconstrained, individualistic, ungovernable, self-determined, non-conforming, lone wolf" (Jackson 1967, 6). Furthermore, in the best combination of variables found to predict the type A scale (see results p 94) the variable autonomy appears as a predictor tending to correlate negatively with the type A scale.

According to this finding, some high scorers on the type A scale seem to have low autonomy score which indicates a tendency towards dependence. As discussed above, the authoritarian

personality is fundementally submissive and dependent (Adorno, 1950). The independent competitive behaviour maintained by the authoritarian personality is an expression of "ego ideal" rather than "real self". The dependency which underlies the real self is only seldom coming to the surface since it violates the ego ideal of the masculine, strong, competitive man.

The finding of autonomy as negatively correlated predictor for the AJAS concurs with the dependence and passivity traits which were found by Rimé and Bonami (1979) to underly the coronary personality. According to them the ambitious and independent behaviour of this personality, is an attempt to disguise these unaccepted traits of passivity and dependency.

As expected from clinical descriptions of the type A person, need affiliation appears in the best set of predictors, as negatively correlated with the type A scale. While the high scorer on autonomy is defined as "enjoying being unattached and free", The high scorer on affiliation "enjoys being with friends and people" (Jackson, 1967). The combination of autonomy and affiliation, both negatively correlated to the type A score in the set of predictors, can indicate a problem in interpersonal relations.

According to Murray (1938), these two needs are, in a sense, conflicting. It is reasonable to assume that one who shows a low affiliation need probably enjoys being free and unattached.

It seems in this instance, however, that on the one hand, the type A person is less interested in interpersonal relations and, on the other hand, is not interested in "being on his own". One possible explanation is that the type A feels insecure in his relations with others, which can explain his aggression (as a means of defence). The insecurity underlying the self confident behaviour was already noted by Dunbar (1947) as an element in the CHD personality.

Another variable in the best set predicting the type A scale is exhibition. This need refers to the wish to be the centre of attention, and engaging in behaviour which wins the notice of others. Exhibition is a measure of degree and quality of interpersonal relations (Jackson, 1967). It is of interest to note that in Rimé and Bonarmi's research (1979) they found that CHD patients were very concerned with their social appearance. These patients tended to protect their image through verbal exhibitionism and through the need to reply to critics and justify their failures.

Although indirectly, the similarity between these elements in the type A person (as found in the present study) and in the CHD patient (as found in Rime and Bonami's study), corroborates the hypothesized relationship between the two.

The need "play" was found to predict both the type A score and the hard driving score. This need is negatively correlated with these two scales, when in the combination of predictors.

According to Murray, play releases internal tension, it can sometimes be an escape from reality as well as being an enjoyable relaxation from stress.

The importance of the negative correlation found between the need "play" and type A behaviour lies in the fact that the type A person seems to lack this "stress reducing mechanism". The relevance of this finding to the relationship between type A behaviour and CHD is clear. The possible mechanism operating in the development of CHD due to the stress factor was discussed above (the section on stress p 24). Thus, being exposed to stress situations (due to his specific personality traits), the type A person does not have a simple stress reducing mechanism (such as play). This chronic, accumulating stress of life associated with aggressive, ambitious person might contribute to the development of the disease.

Thus, the description of the high scorer on the type A scale seems to concur with previous studies done on the coronary patient. Elements of authoritarianism which implies inconsistency between overt-dominant and covert-dependent personality, and the interpretation of aggression as defence mechanism further support the description of the coronary personality by the psychosomatic theories of Arlow (1945) and Dunbar (1947). The interpretation of the type A behaviour as an attempt to <u>control</u> the environment (Glass et al 1974) does not contradict this view: the strong need for control might be based on insecurity of the individual in his relationships with his environment.

The speed and impatience scale

This scale showed the most significant difference between the CHD group and the other groups. The highest correlation between this scale and PRF scales is that of need aggression (.61). The other important correlation (although not reacting the cut-off value of (.40)) is that of the trait impulsivity (.37). The description of the content of the speed and impatience scale explains these correlations. Thus, although indirectly, this finding implies that aggression seems to be a strong characteristic of the CHD group. This conclusion cannot, however, be applied to the ulcer group, since in relation to the speed and impatience scale, there is no conclusive confirmation of the hypothesis that CHD and ulcer groups belong to the same "set".

The interpretation of aggression as a defence mechanism (due to the high correlation with need defendence) supports the view that the aggressive behaviour might be a facade disguising underlying insecurity (Dunbar 1947).

Although there is no apparent correlation between need "change" and the speed and impatience scale, it is clear that in the best set of PRF variables predicting the speed and impatience scale, the need change tends to correlate negatively with the SJAS. The definition of a high scorer on "change" is as follows: "(He) likes new and different experiences, dislikes routine and avoids it, may readily change opinions or values in different circumstances and adapts readily to changes in

environment" (Jackson 1967, 6). This tendency of a negative relationship between change and SJAS, may suggest elements of inflexibility. Such elements were noted by Dunbar when she described the CHD personality as functioning well in conditions of "highly unified, rigidly crystallized life role" (p 118). However, once the shell was cracked this life role to which they were culturally well adapted broke down and their apparent strong defences tended to collapse, showing their extreme brittleness.

Another need appearing in the best set of PRF variables predicting the speed and impatience scale is "endurance". Endurance refers to the willingness to work for long hours and to perseverance and patience in one's work habits (Jackson, 1967).

Murray (1938) views the endurance measure as a liberated vital energy. He views a continum between two extreme states: Zest and apathy. Endurance embodies one aspect of zest. Endurance appears to have a high positive correlation with achievement in the present study (.66). Thus, the picture of the type A person as "bubbling with energy" (Gentry, 1979) is supported by finding endurance in the best set of predictors for the speed and impatience scale.

The trait "impulsivity" also appears in the best set predicting the speed and impatience scale. This trait refers to the tendency to react on the spur of the moment (Jackson, 1967).

The individual possessing this trait is, according to Murray, somewhat restless, quick to move, quick both to make up his mind and to voice his opinion. As discussed above, Rimé and Bonami described impulsivity as an underlying trait of the coronary personality although the CHD patient, according to their view does not acknowledge this trait and thus it cannot be detected through direct questionnaires.

The combination of aggression and impulsivity suggests that at least some of the aggression of the type A person is not repressed.

The last trait in the best set of predictors for the speed and impatience scale is nurturance: This trait appears to correlate negatively with the SJAS, when in the combination of predictors Nurturance is a measure of the degree and quality of interpersonal relations. (Jackson, 1967). It is described as giving sympathy and comfort, and offering a helpful hand to those who need it. The accompanying feelings are ones of tenderness and pity. The negative correlation in this set of predictors is understandable, given the high aggression is characteristic of the high scorer on speed and impatience. The aggression measured by the PRF is as is nurturance, a measure of degree and quality of interpersonal relations.

Summing up the correlational analysis of the speed and impatience scale suggests that aggression and impulsivity are the central elements in this behaviour. An inconsistency can be detected between elements of endurance (which means

perseverence and patience in work situations) and between impulsivity (which implies impatience and a tendency to act without deliberation). These elements support the clinical descriptions of the type A person, (Gentry, 1979) which emphasise the importance of work to him. According to these descriptions, the type A person does not have many sources of gratification except his work. Thus, while showing impatience in interpersonal relations which are not of interest for him, he is perseverent and unrelenting in his work habits. This orientation might raise the speculation that the type A person sees his work as being an object on which he can exert his need for control. (Glass et al 1974). Thus, he indulges himself in work activities. On the other hand, lack of security in interpersonal relations brings him to "turn his back" on these relations, which is expressed in an aggressive-impulsive, non-nurturant attitude towards people.

The job involvement scale

The job involvement scale was found to correlate highly with achievement (.42), dominance (.47), exhibition (.40) and desirability (.40).

Achievement and dominance have already been discussed as two of the three central elements in the type A scale. Exhibition was seen to be one of the factors in the best set of predictors of the type A scale. Desirability and exhibition as strong correlates of the job involvement scale illuminate the importance of social appearance for the high scorer on job involvement. (the latter was noted by Rimé and Bonami 1979, as characteristic of the coronary personality).

The interesting finding concerning job involvement is that in contrast to the two former scales, job involvement does not correlate highly with aggression (.10). The absence of aggression is also evident in the best set of PRF variables for predicting the job involvement scale. Thus, since job involvement was found to be highly insignificant in the differences between CHD and other groups, the possible importance of aggression in the development of CHD is highlighted.

Thus, the job involvement scale appears to be strongly correlated with achievement and dominance, but less so with aggression.

In the best set predicting the job involvement scale, two

"new" variables appear: These are "cognitive structure" and "understanding".

Cognitive structure is, according to Jackson (1967), a measure of control. The high scorer on this variable is described as not liking ambiguity and uncertainty in information. He tends to be rigid and needs structure. The understanding need refers to intellectual orientation. The high scorer is described as willing to understand many areas of knowledge and is valuing logical thought and synthesis of ideas (Jackson, 1967).

While both these needs refer to cognitive functioning, that of cognitive structure implies a need to control the environment, thus further supporting the interpretation of Glass et al (1974) of the type A behaviour as an attempt to control the environment.

Thus, the job involvement scale appears to be strongly correlated with dominance and achievement, but, in contrast to the type A scale and the speed and impatience scale, it does not seem to be strongly associated with aggression. Elements of exhibition and desirability emphasize the importance of social appearance, and the need to control is demonstrated in finding "cognitive structure" to be a predictor of the job involvement scale.

The hard driving scale

The combination of best PRF predictors for the hard driving scale is as follows: Achievement, aggression, dominance, nurturance, play (negatively correlated), succorance and understanding. The needs that seem to be central in the type A scale, seem to be central here as well. However, in addition to these variables, the need "succorance" appears. The definition of a high scorer on succorance in the PRF is as follows: "He frequently seeks the sympathy, protection, love, advice and reassurance of other people; (and) may feel insecure or helpless without such support". (Jackson, 1967). In addition to the variable succorance, which correlates positively with the hard driving scale, another trait, nurturance, was found as a predictor correlating negatively with the hard driving scale. The relationships found in this study between these two needs were, according to Murray, (1938) to be expected. The nurturance need is the tendency to satisfy the succorance needs in an object. The most obvious example to this is, according to Murray, the child-mother relationship. Succorance as a predicting variable which correlates positively with the hard driving scale, suggests the existence of insecurity and dependence in the high scorer on hard driving. These trends of insecurity have already been highlighted above and further support Dunbar (1947) and Arlow's (1945) formulations. According to Arlow, an incomplete identification of the child with his father results in the CHD patient behaving as "a youngster

masquerading in his father's clothes".

Elements of insecurity and anxiety are coped with by presenting an independent, self-confident behaviour (a defence mechanism of reaction formation).

The succorance need, which is a specific form of dependence, highlights an aspect of type A behaviour, which is not characteristic of the authoritarian personality. In his description of the authoritarian personality, Brunswick (Adonno, 1950) made a distinction between "a diffuse ego alien dependence" and "a focal, love seeking succorance". High scorers on authoritarianism were characterised by the first kind of dependence, while those who got low authoritarianism scores were characterised by the second. The authoritarian personality is characterised by an utilitarian approach towards people and a "dependence (on people) for things"in contrast to a"dependence for love".

Thus, the profile of the high scorer on hard driving is characterised by high achievement, aggression and dominance. However, the appearance of the need succorance as positively correlated with this scale (in the combination of predictors) further supports the aspect of insecurity discussed above.

Subsidiary analysis of PRF scales

Although not part of the original design, a one-way Anova was done on the PRF scores of the research groups, as well as on the JAS scores. In this analysis, the scale harm-avoidance showed a significant difference ($p<.05$) between CHD and the other groups. The CHD patients were found to have the lowest score on this variable in comparison to all the other groups. A low scorer on harm-avoidance can be described as enjoying exciting activities especially if danger is involved, as not avoiding the risk of bodily harm and as not seeking to maximize personal safety (Jackson 1967). One possible way of looking at the relatively low harm-avoidance score is in line with the previously discussed authoritarian personality variables: According to this theory (Adonno, 1950), the authoritarian personality tends to identify with the masculine stereotype. This stereotype embodies demonstration of courage and enjoyment of dangerous situations.

The relatively low need in harm-avoidance can also be examined in the light of physiological mechanisms linking personality variables to CHD. Having a relatively low score on this need, the individual might expose himself to danger situations more often than others, so as to satisfy his need. Danger situations which he confronts, might thus cause reactions of "fight or flight" and the development of CHD can be understood in terms of the chain of events hypothesis (Carruthers, 1969). Another aspect of a low harm-avoidance need should be highlighted - the individual showing this trait might engage in activities that are known to increase the risk of

developing CHD. Examples of such activites are smoking, or not taking care of one's weight or food quality. Further research which controls for physical risk factors is needed in order to clarify this point.

Interestingly, in contrast to the fact that the scores on the type A scales were similar for the CHD and ulcer groups, these two groups show big difference in their harm-avoidance score. Thus, low harm-avoidance seems to be unique to the CHD group in this study.

10.3 Summary and conclusions

The results of the present study, highlight several points of interest:

The first important issue is that given the present stage of knowledge, there is no justification to refer to the type A behaviour as a risk factor for CHD only. The possibility exists that duodenal ulcer patients, like CHD patients, tend to be characterised by a higher than average degree of type A behaviour. Further research with a variety of psychosomatic groups is needed in order to investigate the relationship of the type A behaviour pattern to other diseases.

Another conclusion highlights the importance of identifying personality variables associated with the type A behaviour pattern. the results of the present study demonstrate that the type A behaviour has strong associations with enduring personality traits. The combinations of variables - achievement, aggression and dominance - seem to be strongly associated with this behaviour. This explanation concurs with the basic principles in Murray's (1938) theory that views a behaviour pattern as satisfying underlying needs.

These personality variables should be taken into account when dealing with prevention and rehabilitation. The implications seem clear: trying to change the type A behaviour only might prove insufficient, since the needs associated with the behaviour will continue to operate, presumably evoking intra-personal stress and tension, which is thought to be pathogenic.

Paradoxically, the modification of behaviour (without changing the core emotions) might even prove dangerous: while the type A behaviour enables the discharge of some emotional drives, a behaviour change might lead to repression of emotions and needs, the possible pathological effects of which have been much discussed.

The understanding of the relationship between type A behaviour and the variables, aggression and dominance is given depth by the observation of the interrelationships between the PRF sclaes. This observation illuminates the strong correlation which exists between aggression and defendence (.62) and between dominance and defendence (.44).

Thus, the aggressive-dominant behaviour of the type A person can be partly explained through a need for self-protection, which indicates possible insecurity and anxiety.

Support for this interpretation is further given by the analysis of the best sets of variables predicing the type A scale. In these sets, affiliation , autonomy and nurturance were found to correlate negatively with type A. In addition the variable succorance appears as a predictor (positively correlated) with the hard driving scale. The appearance of these variables in the best set of predictors of the type A scale, illuminates the personality inconsistencies long since thought to underlie the type A-"like" behaviour observed by clinicians in CHD and ulcer patients. The internal inconsistency between the ambitious-aggressive and the dependent-insecure aspects of the personality, brings back to the arena the

the older psychosomatic theories which interpreted the specific behaviour of CHD (and ulcer) patients as being a defence against dependence and insecurity (Arlow, 1945; Dunbar, 1948).

The classification of people into two types (A and B) is an easy task since it is based on clearly observable characteristics. However, using this simplified nomenclature as a main source of evaluation might omit important variables which need be considered when taking account of prevention and rehabilitation.

The natural question which needs to be asked is whether the type A concept is necessary at all.

The advantage of diagnosing this behaviour lies in the visibility of the type A pattern. The labelling of "type A" might serve as a first stage evaluation and might tentatively indicate that a problem exists. Murray (1938) emphasizes the importance of behaviour by saying that behaviour is one of the most significant aspects of the organism and hence, of the personality. Everything which is regarded as important depends upon behaviour and its results: "Physical well-being and survival, development and achievement, happiness and the perpetuation of the species" (Murray 1938 (54)). Murray believes that for the purpose of evaluation of the personality, it is best to start with behaviour. Thus, the accumulating evidence for the usefulness of the type A concept in prediction of CHD justifies its use for this specific purpose. However,

in respect to prevention, treatment and rehabilitation, this concept seems to have limited value, since the essence of the fundamental variables below the surface should be investigated.

When evaluating the results of the present study, it is important to notice that the correlational analysis was done on the "type A pattern" and not on the personality pattern of CHD patients. Thus, the trends indicated by this analysis should be seen in relation to "type A behaviour" and not in relation to the "coronary personality". It would be of interest to study the personality correlates of the type A behaviour in specified samples of CHD and other psychosomatic disorders. Such studies will require sample sizes far beyond those available to the present study.

The trends indicated in the present study jsutify further research in this direction.

11. REFERENCES

1. Adorno TW, Brunswick EF, Lewinson D and Sanford RN.
The authoritarian personality.
Harper and Brothers, New York, 1950.

2. Alexander F.
Psychosomatic medicine.
Novello and Company, London, 1952.

3. Alexander F, French TM, Pollock JH (eds).
Psychosomatic epscificity, Vol. I, Chicago,
The University of Chicago press, 1968.

4. Arlow JA
Identification mechanisms in coronary occlusion.
Psychosom Med 1945, 7, 195-209.

5. Bendien J and Groen JJ.
Neurotocism and extroversion in patients with
myocardial infarctions.
J Psychosomatic Research, 1963, 7, 11.

6. Blumenthal JA, Williams RB, Kong Y et al.
Type A behaviour pattern and coronary atherosclerosis.
Circulation 1978, 58, 634.

7. Bruhn JG, Paredes A, Abselt CA, Wolf S.
Psychological predictors of sudden death in
myocardial infarction.
Journal of Psychosomatic Research 1974, 18, 187-191.

8. Bruhn JG et al.
Social aspects of coronary heart disease in a
Pennsylvanian German community.
Soc Sci Med 1968, 2, 201-212.

9. Buell CJ, Eliot RS.
Psychosocial and behavioural influences in the pathogenesis of acquired cardiovascular disease.
American Heart Journal 1980, 5, 723-740.

10. Cannon WB.
The wisdom of the body.
Norton, New York, 1932.

11. Carruthers MA.
Aggression and atheroma.
Lancet 1969, 11, 1170.

12. Chesler E.
Clinical Cardiology, Bristol,
John Wright and Sons, 1981.

13. Cohen MJ, Rickles WH and McArthur DC.
Evidence for physiological response stereotype in migraine headache.
Psychosomatic Medicine 1978, 40, 344-354.

14. Davies MH.
Stress, personality and coronary artery disease.
South African Journal of Hospital Medicine
1982, 8, 11, 271-278.

15. Ditto WB.
Daily activities of college students and the construct validity of the J.A.S.
Psychosomatic Medicine, 1982, 6, 537-543.

16. Dixon WJ (Ed).
Biomedical Data Provessing (BMDP) Statistical software.
Department of Biomathematics, University of California press, Berkley 1981.

17. Dohrenwend BS.
Life events as stressors: A methodological inquiry.
Jou Hlth Soc Behav 1973, 14, 167-175.

18. Dunbar F.
Mind and Body: Psychosomatic medicine, Random
House, New York, 1947.

19. Dunbar F.
Emotions and bodily changes, New York
Columbia University press, 1954.

20. Engel BT.
Stimulus response and individual response specificity.
Archives of General Psychiatry 1960, 2, 305-313.

21. Floderus B.
Psychosocial factors in relation to CHD and associated
risk factors. Nord Hyg tidsk auppl 6, 1974.

22. Frank KA et al.
Type A behaviour pattern and coronary angiography.
JAMA 1978, 240, 761-763.

23. French JRP Jr and Caplan R.
Organisational stress and individual strain in
Narrow A. (Editor)
The failure of success, New York, Amacom, 1972.

24. Friedman M and Rosenman RH.
Type A behaviour and your heart.
New York, Alfred and Knopf Incorp. 1974.

25. Friedman M, Manwaring JH, Rosenman RH et al.
Instantaneous and sudden death: Clinical and physiological
differentiation in coronary artery disease.
JAMA 1973, 225, 1319-1328.

26. Friedman M.
The modification of type A behaviour in post-infarction patients.
American Heart Journal, 1979, 97, P 551-560.

27. Funkenstein JH, King SH and Drolette M.
Mastery of stress, Harvard University Press, Cambridge, 1957.

28. Garma A.
Peptic ulcer and psychoanalysis.
Baltimore, Williams and Wilkins, 1958.

29. Gentry WD, Williams RB.
Psychologic aspects of myocardial infarction and coronary care. The C.V. Mosby Company, 1979, 1-64.

30. Gianturco DT, Breslin MS, Heyman A, Gentry WD, Jenkins CD, Kaplan B.
Personality patterns and life stress in ischaemic cerebrovascular disease.
Stroke 1974, 5, 453-460.

31. Glass DC, Snyder MC and Hollis JF.
Time urgency and the type A coronary prone behaviour pattern.
Journal of Applied Social Psychology 1974, 4, 125-140.

32. Glass DC.
Stress, behaviour pattern and coronary disease.
Am Sci, 1977, 65, 177.

33. Gordon T, Garcie Palmie MR, Kagan A et al.
Differences in CHD in Framingham, Honolulu and Puerto Rico.
Journal Chronic Diseases 1974, 27, 329-344.

34. Groen JJ and Drory S.
Influence of psychosocial factors on coronary heart disease.
A comparison of autopsy findings with the results of a sociological questionnaire.
Path. Microbiol. 1967, 30, 779.

35. Groen JJ, Dreyfuss F and Gutman L.
Epidemiological nutritional and sociological studies of atherosclerotic heart disease among different ethnic groups in Israel.
Progress in Biochemical Pharmacology,
Recent advances in Atherosclerosis Vol 4, 20 Ed. by C.J. Miras, A.N. Howard and R. Paoletti.

36. Halliday TC.
Psychosocial Medicine, New York, Norton, 1948.

37. Harrison
Harrison's principles of internal medicine.
McGraw Hill Book Co., New York, 1980.

38. Haynes SN, Gannon L.
Psychosomatic disorders: A psychophysiologic approach to etiology and treatment, Praeger, 1981.

39. Henry JP and Ely PL.
Physiology of emotional stress. Specific responses.
J.S.C. Medical Assoc. 1979, 75, 501.

40. Hinkle LE.
Ecological observations of the relations of physical illness, mental illness and the social environment.
Pschosom Med, 1967, 23, 298.

41. Hill O.
Modern trends in psychosomatic medicine.
Butterworth, London, 1976.

42. Hocking R.
The analysis and selection of variables in linear regression.
Biometrics 1976, 32, 1-49.

43. Jackson ND.
Personality research form mannual.
Research Psycologists Press Inc, 1967

44. Jenkins CD, Rosenman RH and Friedman M.
Replicability of rating the coronary prone behaviour pattern.
Br Jour Prev Soc Med 1968, 22, 16.

45. Jenkins CD
Psychological and social precursors of coronary disease. A Review, New England Journal of Medicine 1971, 284, 244, 307.

46. Jenkins CD, Zyzanski SJ and Rosenman RH.
Progress toward validation of a computer scored test for the type A coronary prone behaviour pattern.
Psychosom Med, 1971, 33, 193.

47. Jenkins CD, Zyzanski SJ and Rosenman RH.
Risk of new myocardial infarction in middle aged men with manifest coronary heart disease.
Circulation 1976, 53, 342-347.

48. Jenkins CD.
Psychologic and social risk factors for CHD.
The New England Journal of Medicine, 1976, 294, 987, 1033.

49. Jenkins CD.
Behavioural risk factors in coronary artery disease.
Annual Review of Medicine 1978, 29, 543-562.

50. Jenkins CD, Zyzanski SJ, Rosenman RH.
J.A.S. Mannual. The Psychological Corporation
New York, 1979.

51. Kahn JP, Kornfeld DS, Frank KA, Heller SS,
Hoar DF.
Type A behaviour and blood pressure during coronary
artery bypass surgery.
Psychosom. Med., 1980, 42, 407-414.

52. Kaplan BH et al.
Occupational mobility and coronary heart disease.
Arch Inter Med, 1971, 122, 938.

53. Kenigsberg D et al.
The coronary prone behaviour pattern in hospitalised
patients with and without CHD.
Psychosom Med, 1974, 36, 344.

54. Keys A.
Coronary heart disease in sever countries.
Am Heart Assoc. Monogr, 1970, 29.

55. Kitagawa FM, Hauser PM.
Differential mortality in the U.S.A.
A study in socioeconomic epidemiology.
Cambridge Massachusettes, Harvard University Press, 1973.

56. Knapp PH et al.
Sources of tension in bronchial asthma.
Psychosomatic Medicine 1957, 19, 466.

57. Knapp PH, Menetz SJ, Constantine H and Friedman S.
The context of reported asthma during
psychoanalysis.
Psychosom Med, 1970, 32, 167.

58. Krantz DS, Arabian JM, Davia JF, Parker JS.
Type A behaviour and coronary arterh bypass surgery:
Intra-operative blood pressure and peri-operative
complications.
Psychosom Med, July 1982, 273-284.

59. Lapin BA and Cherckovich GM.
Environmental changes causing the development of
neuroses and convisceral pathology in monkeys. In Society Structure and Disease ed. Levi L. Oxford University Press. 1968, 266-279.

60. Langosch W, Seer P, Bronder G, Kallinke D,
Kulich B and Heim F.
Behaviour therapy with CHD patients: Results of a
comparative study.
Journal of Psychosomatic Research 1982, Vol 26, 5, 475-484.

61. Lehman FW.
Social class and CHD. A sociological assessment
of the medical literature.
Jour Chronic Disease, 1967, 20, 381-391.

62. Leibowitz JO.
The history of coronary heart disease.
Berkley 1970, 64.

63. Lipowski JZ.
Psychosomatic medicine: Current trends and
clinical applications.
New York, Oxford University Press 1977.

64. Lundberg V, Theorell T, Lind E.
Life changes and myocardial infarctions:
Individual differences in life changes scaling.
Jour Psychosom Research 1975, 19, 27-32.

65. Madsen KB.
Theories of motivation. The Kent State
University Press and Minkgaard 1968.

66. Mannuck SB, Craft S, Gold KJ.
Coronary prone behaviour pattern and cardiovascular
response.
Psychophysiology 1978, 15, 403-411.

67. Mason et al.
Selectivity of corticosteroid and catecholamine responses
to various natural stimuli in psychopathology of human
adaptation. Ed. Serham J, New York. Plenum
Publishing Corporation 1976, 147-171.

68. McKinely DG.
Social class and family life. The Free Press of
Glencol, 1964.

69. Mead M.
The concept of culture and the psychosomatic approach.
Psychiatry 1947, 10, 57-76.

70. Medalie JH, Kahn HA, Groen JJ et al.
The prevalence of ischaemic heart disease in relation
to selected variables.
Israel Jour of Med Sci, 1968, 4, 789.

71. Miller RE.
Simultaneous statistical inference.
McGraw's Hill, New York, 1966, 76-102.

72. Murray HA.
Explorations in personality.
Oxford University Press, Oxford, 1938.

73. Neuhaus ECP.
Personality study of asthmatic and cardiac children.
Psychosomatic Medicine 1958, 20, 181-194.

74. Newlin DB and Lewenson RW.
Cardiovascular responses of individuals with type A behaviour pattern and parental CHD.
Jour of Psychosomatic Research 1982, 26, 4, 393-402.

75. Ostfeld AM, Leibowitz BZ, Shekelle RB et al.
A prospective study of the relationships between personality and coronary heart disease.
Jour Chronic Disease 1964, 17, 265.

76. Parkes CM. Benjamin B and Fitzgerald RG.
Broken Heart: A statistical study of increased mortality among widowers.
Br Med Jour 1969, 1, 740.

77. Paulley W.
Ulcer, heart disease and type A behaviour.
Lancet, 1979, 8, 1938.

78. Peskin MM.
Management of the institutionalised child with intractable asthma.
Annals of Allergy 1960, 18, 75-79.

79. Purcell K, Brady K, Chai H, Muser J, Molk L, Gordon N and Means J.
The effect of asthma in children of experimental seperation from family.
Psychosomatic Med, 1969, 31, 144-164.

80. Rahe RH and Lind E.
Psychosocial factors and sudden cardiac death.
A pilot study.
J Psychosom Dis. 1971, 15, 19-24.

81. Rahe RH.
Epidemiological studies of life change and illness.
Int. Jour. Psychia. Med, 1975, 6, 133.

82. Rappaport E.
Current controversies in cardiovascular disease.
W.B. Saunders Company, Philadelphia, 1980.

83. Ray ZZ and Bozek RS.
Dissecting the A-B personality type.
British Journal of Medical Psychology. 1980.
53, 181-186.

84. Ray ZZ and Simon LA.
Is authoritarianism the main element of the
coronary prone personality?
The British Journal of Medical Psychology,
1982, 55, 216-218.

85. Rimé B and Bonami M.
Overt and covert personality traits associated with
coronary heart disease.
British Journal of Medical Psychology, 1979,
52, 77-84.

86. Rosenman RH et al.
A predictive study of coronary heart disease.
The Western Collaborative Group Study.
JAMA 1964, 189, 15.

87. Rosenman RH, Friedman M, Strauss R, Wurm M, Jenkins CD and Messinger HB.
CHD in the Western Collaborative Group Study.
JAMA 1966, 195, 86.

88. Rosenman RH, Friedman M, Strauss R, Jenkins CD, Zyzanaki SJ and Wurm M.
coronary heart disease, the Western Collaborative Study Follow up after 4½ years.
Jour. Chronic Dis. 1970, 23, 173.

89. Rosenman RH et al.
Coronary heart disease in the Western Collaborative Group Study.
Final follow up experience of 8½ years.
JAMA 1975, 233, 872.

90. Ruesch S.
The infantile personality. The core problem of psychosomatic medicine.
Psychosomatic Medicine 1948, 10, 133-144.

91. Russek HI. and Zohman BL.
Relative significance of heredity, diet and occupational stress in CHD in young adults.
Am Jour Med Sci, 1958, 235-266.

92. Russek HI
Role of emotional stress in the etiology of clinical coronary heart disease.
Dis Chest 1967, 52, 1.

93. Sales SM.
Organizational role as a risk factor in CHD.
Admin Sci Qua 1969, 14, 325.

94. Schekelle RB, Schoenberger JA and Stamler J.
Correlates of the J.A.S. type behaviour pattern score.
Jour Chronic Disease 1976, 29, 381-394.

95. Sigurjohnson J.
Occupational variations in mortality from ischaemic heart disease.
Jour Am Geria Soc 1971, 19, 34-40.

96. Streitfeld HS.
The specificity of peptic ulcer to intense oral conflict.
Psychosom. Med, 1954, 16, 315-326.

97. Strümpfer DJW.
Coronary heart disease and coronary prone behaviour
Rehabilitation in South Africa 1978, 22(2), 47-50.

98. Taboroff LH and Brow WH.
Study of the personality patterns of children and adolescents with a peptic ulcer syndrome.
Am Jour of Autopsychiatry 1954, 24, 602-610.

99. Theorell T, Lind E and Floderns B.
The relationship of disturbing life changes and emotions to the early development of myocardial infarction and other serious illness.
Inter Jour Epidemiol 1975, 281, 4.

100. Theorell T, Rahe RH.
Behaviour and life satisfaction characteristic of Swedish subjects with myocardial infarction.
Jour Chronic disease. 1972, 25, 139-142.

101. Thiel HG, Parker D and Bruce TA.
Stress factors and the risk of myocardial infarction
Jour Psychosom Research 1973, 17, 43.

102. Van der Valk JM and Groen JJ.
Personality structure and conflict situations in patients with myocardial infarction.
J Psychosom Dis. 1967, 11, 41.

103. Wardwell WI and Bahnson CB.
Behaviour variables and myocardial infarction in the South-Eastern Connecticut Heart Study.
Jour Chronic Diseases, 1973, 26, 447.

104. Wheatley D.
Stress and the heart: Interactions of the cardiovascular system, behavioural state and psychotropic drugs.
Raven Press, New York, 1981.

105. Williams AO.
Coronary atherosclerosis in Nigeria.
Br Heart Jour 1971, 33, 95-100.

106. Wolf S.
The end of the rope. The role of the brain in cardiac death.
Can Med Assoc Jour 1967, 97, 1022.

107. Wynn A.
The recognition of coronary proneness.
Med Jour Ass 1967, 1, 350.

108. Zyzanski SJ et al.
Psychological correlates of coronary angiographic findings.
Arch Intern Med 1976, 136, 1234.

12. APPENDIX

Appendix A.

The letter sent to the selected subjects.

Dear Sir

I would like to ask your participation in a research done in the field of disease and behaviour.
More knowledge in this area may be helpful in the prevention of disease and rehabilitation.

The questionnaire will require about 1½ hours of your time, and your cooperation will be much appreciated. All information will be treated in the strictest confidence.

I shall contact you within a few days to hear of your decision.

Yours sincerely

Jenkins Activity Survey

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

FORM C

Name (last name first)

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?
A○ Several times a day
B○ About once a day
C○ A few times a week
D○ Once a week
E○ 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

THE PSYCHOLOGICAL CORPORATION
A subsidiary of Harcourt Brace Jovanovich, Inc.

9-174004

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

A much more responsible.
B a little more responsible.
C a little less responsible.
D much less resposible.

44. I find it necessary to hurry
A much more of the time.
B a little more of the time.
C a little less of the time.
D much less of the time.

45. In being precise (careful about detail), I am
A much more precise
B a little more precise.
C a little less precise.
D much less precise.

46. I approach life in general
A much more seriously.
B a little more seriously.
C a little less seriously.
D 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
A at my present job
B five years ago
C Cannot decide.

48. I carried more responsibility
A at my present job.
B five years ago.
C Cannot decide.

49. I was considered to be at a higher level (in prestige or social position).
A at my present job.
B five years ago.
C 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).
A 0 - 1
B 2
C 3
D 4
E 5 or more.

51. How much schooling did you receive?
A 0 - 4 years
B 5 - 8 years
C Some high school
D Completed high school
E Trade school, technical college or business college.
F 3-year qualification, e.g. Bachelor's degree or Technicon diploma.
G Honours degree or 4-year degree
H Post-graduate work at a university or 5 years and longer (e.g. Medici

52. When you were at school, college or university, were you an officer of any group, such as a student council or society, or captain of a sports or athletes team?
A No.
B Yes, I held one such position.
C Yes, I held two or more such positions.

PERSONALITY RESEARCH FORM

FORM AA

DOUGLAS N. JACKSON, Ph.D.

DIRECTIONS

On the following pages you will find a series of statements which a person might use to describe himself. Read each statement and decide whether or not it describes you. Then indicate your answer on the separate answer sheet.

If you agree with a statement or decide that it does describe you, answer TRUE. If you disagree with a statement or feel that it is not descriptive of you, answer FALSE.

In marking your answers on the answer sheet, be sure that the number of the statement you have just read is the same as the number on the answer sheet.

Answer every statement either true or false, even if you are not completely sure of your answer.

Published by

RESEARCH PSYCHOLOGISTS PRESS, INC.

1. I like to be the first to apologize after an argument.
2. I enjoy doing things which challenge me.
3. I pay little attention to the interests of people I know.
4. I get a kick out of seeing someone I dislike appear foolish in front of others.
5. If public opinion is against me, I usually decide that I am wrong.
6. I get annoyed with people who never want to go anywhere different.
7. I live from day to day without trying to fit my activities into a pattern.
8. When someone presents me with strong arguments, I usually try to settle on some middle ground.
9. I would enjoy being a club officer.
10. If I can't finish a task within a certain amount of time, I usually decide not to waste any more time on it.
11. Others think I am lively and witty.
12. I almost always accept a dare.
13. I admire free, spontaneous people.
14. I think a man is smart to avoid being talked into helping his acquaintances.
15. I often decide ahead of time exactly what I will do on a certain day.
16. I feel that adults who still like to play have never really grown up.
17. Sometimes a certain smell reminds me of a place or experience in my past.
18. I consider it important to be held in high esteem by those I know.
19. If I have had an accident, I want sympathy from no one.
20. Philosophical discussions are a waste of time.
21. I was born over 90 years ago.
22. I always try to be considerate of the feelings of my friends.
23. I would never apologize if someone bumped into me and it was his fault.
24. Self-improvement means nothing to me unless it leads to immediate success.
25. I believe that a person who is incapable of enjoying the people around him misses much in life.
26. It doesn't bother me much to have someone get the best of me in a discussion.
27. I would like to wander freely from country to country.
28. Changes in routine disturb me.
29. When I talk to a doctor, I want him to give me a detailed explanation of any illness I have.
30. When someone opposes me on an issue, I usually find myself taking an even stronger stand than I did at first.
31. I am not very insistent in an argument.
32. I don't mind doing all the work myself if it is necessary to complete what I have begun.
33. I am too shy to tell jokes.
34. I am careful about the things I do because I want to have a long and healthy life.
35. I have a reserved and cautious attitude toward life.
36. When I see someone who looks confused, I usually ask if I can be of any assistance.
37. I don't especially care how I look when I go out.
38. I love to tell, and listen to, jokes and funny stories.
39. Most animals are rather uninteresting to watch.
40. I give little thought to the impression I make on others.
41. I always appreciate it when people are concerned about me.
42. I often try to grasp the relationships between different things that happen.
43. I try to get at least some sleep every night.
44. Nothing that happens to me makes much difference one way or the other.
45. Several people have embarrassed me publicly but I always take it like a good sport.
46. I get disgusted with myself when I have not learned something properly.
47. Trying to please people is a waste of time.
48. I swear a lot.
49. Adventures where I am on my own are a little frightening to me.
50. I like to have new things to eat from week to week.
51. It doesn't bother me to put aside what I have been doing without finishing it.
52. If someone finds fault with me I either listen quietly or just ignore the whole thing.
53. I try to control others rather than permit them to control me.
54. If I find it hard to get something I want, I usually change my mind and try for something else.
55. I like to have people talk about things I have done.
56. I would enjoy learning to walk on a tightrope.
57. I find that I sometimes forget to "look before I leap."
58. All babies look very much like little monkeys to me.
59. When I am going somewhere I usually find my exact route by using a map.
60. I consider most entertainment to be a waste of time.
61. The smell of freshly-baked bread makes my mouth water.
62. I very much enjoy being complimented.
63. I am perfectly capable of solving my personal problems without consulting anyone.
64. I can't see how intellectuals get personal satisfaction from their impractical lives.

65. I have a number of outfits of clothing, each of which costs several thousand dollars.
66. I often take some responsibility for looking out for newcomers in a group.
67. I do everything in my power not to have to admit defeat.
68. I work because I have to, and for that reason only.
69. Loyalty to my friends is quite important to me.
70. If someone does something I don't like, I seldom say anything.
71. When I was a child, I wanted to be independent.
72. My likes and dislikes are the same from year to year.
73. I don't enjoy confused conversations where people are unsure of what they mean to say.
74. I don't like people to joke about what they feel are my shortcomings.
75. I have little interest in leading others.
76. If people want a job done which requires patience, they ask me.
77. I would not like the fame that goes with being a great athlete.
78. I would never want to be a forest-fire fighter.
79. Rarely, if ever, do I do anything reckless.
80. I feel very sorry for lonely people.
81. My personal papers are usually in a state of confusion.
82. I enjoy parties, shows, games — anything for fun.
83. I don't pay much attention to my surroundings.
84. Social approval is unimportant to me.
85. I often seek out other people's advice.
86. I do almost as much reading on my own as I did for classes when I was in school.
87. I make all my own clothes and shoes.
88. I have a number of health problems.
89. I sometimes take the blame for things that aren't really my fault in order to make someone else feel better.
90. I will keep working on a problem after others have given up.
91. Most of my relationships with people are business-like rather than friendly.
92. If someone has a better job than I, I like to try to show him up.
93. I don't want to be away from my family too much.
94. I would be willing to give up some financial security to be able to change from one job to another if something interesting came along.
95. I tend to start right in on a new task without spending much time thinking about the best way to proceed.
96. I usually let unkind things someone might say about me pass without making any return comment.
97. I feel confident when directing the activities of others.
98. The mere prospect of having to put in long hours working makes me tired.
99. I don't mind being conspicuous.
100. I would never pass up something that sounded like fun just because it was a little bit hazardous.
101. The people I know who say the first thing they think of are some of my most interesting acquaintances.
102. I dislike people who are always asking me for advice.
103. I keep all my important documents in one safe place.
104. When I have a choice between work and enjoying myself, I usually work.
105. I like to listen to the sound of rain falling.
106. The good opinion of one's friends is one of the chief rewards for living a good life.
107. I would not like to be married to a protective person.
108. If the relationships between theories and facts are not immediately evident, I see no point in trying to find them.
109. I have attended school at some time during my life.
110. In the long run humanity will owe a lot more to the teacher than to the salesman.
111. I resent being punished.
112. I try to work just hard enough to get by.
113. I am considered friendly.
114. I am quite soft-spoken.
115. My greatest desire is to be independent and free.
116. I have a specific routine of recreational activities.
117. Before I ask a question, I figure out exactly what I know already and what it is I need to find out.
118. I try never to allow anyone to get the upper hand with me.
119. I would make a poor judge because I dislike telling others what to do.
120. If I want to know the answer to a certain question, I sometimes look for it for days.
121. I feel uncomfortable when people are paying attention to me.
122. I can't imagine myself jumping out of an airplane as skydivers do.
123. I am not an "impulse-buyer."
124. People like to tell me their troubles because they know that I will do everything I can to help them.
125. Most of the things I do have no system to them.
126. Once in a while I enjoy acting as if I were tipsy.
127. I rarely notice how things smell.
128. The opinions that important people have of me cause me little concern.

129. When I need money, it makes me feel good to know that someone can help me out.
130. I have unlimited curiosity about many things.
131. I rarely use food or drink of any kind.
132. I often have the feeling that I am doing something evil.
133. I would rather let others have their way with me than try to protest.
134. I often set goals that are very difficult to reach.
135. After I get to know most people, I decide that they would make poor friends.
136. Stupidity makes me angry.
137. I usually try to share my problems with someone who can help me.
138. I am always looking for new routes to take on a trip.
139. When I need one thing at the store I get it without thinking what else I may need soon.
140. Most people are honest enough that I would let them work in my home without close supervision.
141. I am quite good at keeping others in line.
142. When someone thinks I should not finish a project, I am usually willing to follow his advice.
143. I like to be in the spotlight.
144. I think it would be enjoyable and rather exciting to feel an earthquake.
145. I have often broken things because of carelessness.
146. I get little satisfaction from serving others.
147. Before I start to work, I plan what I will need and get all the necessary materials.
148. I only celebrate very special events.
149. Going barefoot in cool grass is great fun.
150. I constantly try to make people think highly of me.
151. If I feel sick, I don't like to have friends or relatives fuss over me.
152. When I was a child, I showed no interest in books.
153. I have never ridden in an automobile.
154. I am seldom ill.
155. I would never allow someone to blame me for something which was not my fault.
156. I would rather do an easy job than one involving obstacles which must be overcome.
157. I enjoy being neighborly.
158. I seldom feel like hitting anyone.
159. I would like to have a job in which I didn't have to answer to anyone.
160. It would take me a long time to adapt to living in a foreign country.
161. It upsets me to go into a situation without knowing what I can expect from it.
162. I tend to react strongly to remarks which find fault with my personal appearance.
163. Most community leaders do a better job than I could possibly do.
164. I don't like to leave anything unfinished.
165. I was one of the quietest children in my group.
166. I avoid some hobbies and sports because of their dangerous nature.
167. I make certain that I speak softly when I am in a public place.
168. I believe in giving friends lots of help and advice.
169. I can work better when conditions are somewhat chaotic.
170. Most of my spare moments are spent relaxing and amusing myself.
171. I feel about the same after a hearty meal as before one.
172. It seems foolish to me to worry about my public image.
173. I think it would be best to marry someone who is more mature and less dependent than I.
174. I would very much like to know how and why natural events occur in the way they do.
175. I could easily count from one to twenty-five.
176. I almost always feel sleepy and lazy.
177. I am the kind of person who is always doing errands for others.
178. My goal is to do at least a little bit more than anyone else has done before.
179. Usually I would rather go somewhere alone than go to a party.
180. Life is a matter of "push or be shoved."
181. I often do things just because social custom dictates.
182. Most people have a hard time predicting how I will respond to something they say to me.
183. I like to be with people who are unpredictable.
184. I don't get angry when people laugh at my errors.
185. I seek out positions of authority.
186. When other people give up working on a problem, I usually quit too.
187. I would enjoy being a popular singer with a large fan club.
188. I would enjoy the feeling of riding to the top of an unfinished skyscraper in an open elevator.
189. I enjoy arguments that require good quick thinking more than knowledge.
190. I really do not pay much attention to people when they talk about their problems.
191. I dislike to be in a room that is cluttered.
192. Practical jokes aren't at all funny to me.

193. I like to run through heaps of fallen leaves.
194. Nothing would hurt me more than to have a bad reputation.
195. I usually make decisions without consulting others.
196. Abstract ideas are of little use to me.
197. Sometimes I feel thirsty or hungry.
198. My memory is as good as other people's.
199. I avoid situations which would make me seem inferior.
200. I really don't enjoy hard work.
201. I try to be in the company of friends as much as possible.
202. If someone hurts me, I just try to forget about it.
203. If I have a problem, I like to work it out alone.
204. I would be satisfied to stay at the same job indefinitely.
205. I won't answer a person's question until I am very clear as to what he is asking.
206. I would get into a long discussion rather than admit I am wrong.
207. I think it is better to be quiet than assertive.
208. When I hit a snag in what I am doing, I don't stop until I have found a way to get around it.
209. At a party, I usually sit back and watch the others.
210. I try to get out of jobs that would require using dangerous tools or machinery.
211. I am not one of those people who blurt out things without thinking.
212. I am usually the first to offer a helping hand when it is needed.
213. I seldom take time to hang up my clothes neatly.
214. I like to go "out on the town" as often as I can.
215. I have never seen a statue that reminded me of a real person.
216. I will not go out of my way to behave in an approved way.
217. I usually tell others of my misfortunes because they might be able to assist me.
218. When I see a new invention, I attempt to find out how it works.
219. I have never seen an apple.
220. I am not willing to give up my own privacy or pleasure in order to help other people.
221. When people try to make me feel important, I feel guilty and uncomfortable about it.
222. I prefer to be paid on the basis of how much work I have done rather than on how many hours I have worked.
223. I have relatively few friends.
224. I often find it necessary to criticize a person sharply if he annoys me.
225. Family obligations make me feel important.
226. The main joy in my life is going new places and seeing new sights.
227. I don't keep a very accurate account of my financial resources.
228. I am only very rarely in a position where I feel a need to actively argue for a point of view I hold.
229. When I am with someone else I do most of the decision-making.
230. I don't believe in sticking to something when there is little chance of success.
231. If I were to be in a play, I would want to play the leading role.
232. Swimming alone in strange waters would not bother me.
233. I often get bored at having to concentrate on one thing at a time.
234. If someone is in trouble, I try not to become involved.
235. A messy desk is inexcusable.
236. I prefer to read worthwhile books rather than spend my spare time playing.
237. I like to have my neck massaged.
238. When I am doing something, I often worry about what other people will think.
239. I prefer not being dependent on anyone for assistance.
240. It is more important to me to be good at a sport than to know about literature or science.
241. I usually wear something warm when I go outside on a cold day.
242. Most of my teachers were helpful.
243. I try not to let anyone else take credit for my work.
244. I have rarely done extra studying in connection with my work.
245. To love and be loved is of greatest importance to me.
246. If I have to stand in line, I seldom try to cut ahead of the other people.
247. I delight in feeling unattached.
248. When I find a good way to do something, I avoid experimenting with new ways.
249. I don't like situations that are uncertain.
250. Since people are always looking for a person's weak spots, I am careful never to talk about mine.
251. I would make a poor military leader.
252. I am willing to work longer at a project than are most people.
253. When I was young I seldom competed with the other children for attention.
254. I prefer a quiet, secure life to an adventurous one.
255. I always try to be fully prepared before I begin working on anything.
256. I would prefer to care for a sick child myself rather than hire a nurse.

257. I could never find out with accuracy just how I have spent my money in the past several months.
258. I spend a good deal of my time just having fun.
259. All cheeses taste the same to me.
260. I don't care if my clothes are unstylish, as long as I like them.
261. The thought of being alone in the world frightens me.
262. I am more at home in an intellectual discussion than in a discussion of sports.
263. I think the world would be a much better place if no one ever went to school.
264. We ought to let the rest of the world solve their own problems and just look out after ourselves.
265. When I was a child I allowed other children to take my toys away from me.
266. People have always said that I am a hard worker.
267. I seldom go out of my way to do something just to make others happy.
268. I often make people angry by teasing them.
269. I respect rules because they guide me.
270. I would like the type of work which would keep me constantly on the move.
271. I very seldom make detailed plans.
272. If faced by a good argument, I am usually willing to change my position even on important issues.
273. When two persons are arguing, I often settle the argument for them.
274. If I had to do something I didn't like, I would put it off and hope that someone else might do it.
275. I often monopolize a conversation.
276. To me, crossing the ocean in a sailboat would be a wonderful adventure.
277. It seems that emotion has more influence over me than does calm meditation.
278. I avoid doing too many favors for people because it would seem as if I were trying to buy friendship.
279. My work is always well organized.
280. Most of my friends are serious-minded people.
281. I like the way my muscles tingle after a good workout.
282. One of the things which spurs me on to do my best is the realization that I will be praised for my work.
283. I prefer to face my problems by myself.
284. I really don't know what is involved in any of the latest cultural developments.
285. I have no sense of touch in my fingers.
286. My life is full of interesting activities.
287. I would resist anyone who tried to bully me.
288. When people are not going to see what I do, I often do less than my very best.
289. Most people think I am warm-hearted and sociable.
290. I show leniency to those who have offended me.
291. I find that I can think better without having to bother with advice from others.
292. I would be content to live in the same town for the rest of my life.
293. I would never make something without having a good idea of what the finished product should look like.
294. People find it very difficult to convince me that I am wrong on a point no matter how hard they try.
295. I would not do well as a salesman because I am not very persuasive.
296. When I am working outdoors I finish what I have to do even if it is growing dark.
297. I think that trying to be the center of attention is a sign of bad taste.
298. I never go into sections of a city that are considered dangerous.
299. I generally rely on careful reasoning in making up my mind.
300. When I see a baby, I often ask to hold him.
301. I often forget to put things back in their places.
302. I like to watch television comedies.
303. I rarely sit and watch the water at a beach or stream.
304. If I have done something well, I don't bother to call it to other people's attention.
305. If I ever think that I am in danger, my first reaction is to look for help from someone.
306. If I believe something is true, I try to prove that my theory will hold up in actual practice.
307. If someone pricked me with a pin, it would hurt.
308. I often question whether life is worthwhile.
309. Sometimes I let people push me around so they can feel important.
310. I don't mind working while other people are having fun.
311. When I see someone I know from a distance, I don't go out of my way to say "Hello."
312. I become angry more easily than most people.
313. I find that for most jobs the combined effort of several people will accomplish more than one person working alone.
314. I like to work on several projects at the same time so I can change from one to another.
315. When I take a vacation I like to go without detailed plans or time schedules.
316. Most of the people with whom I am in contact ignore any minor errors I make.
317. If I were in politics, I would probably be seen as one of the forceful leaders of my party.
318. If I get tired while playing a game, I generally stop playing.
319. I try to get others to notice the way I dress.
320. I would enjoy exploring an old deserted house at night.

321. Often I stop in the middle of one activity in order to start something else.
322. People's tears tend to irritate me more than to arouse my sympathy.
323. I spend much of my time arranging my belongings neatly.
324. People consider me a serious, reserved person.
325. One of my favorite pastimes is sitting before a crackling fire.
326. I feel that my life would not be complete if I failed to gain distinction and social prestige.
327. When I was a child, I disliked it if my mother was always fussing over me.
328. I would rather be an accountant than a theoretical mathematician.
329. If I were exploring a strange place at night, I would want to carry a light.
330. I am able to make correct decisions on difficult questions.
331. I would never be the "low man on the totem pole" if I could help it.
332. It doesn't really matter to me whether I become one of the best in my field.
333. I truly enjoy myself at social functions.
334. I do not like to see anyone receive bad news.
335. I would not mind living in a very lonely place.
336. I see no reason to change the color of my room once I have painted it.
337. My work is carefully planned and organized before it is begun.
338. I am always ready to defend myself against remarks people might make about me or my friends.
339. I feel incapable of handling many situations.
340. I will continue working on a problem even with a severe headache.
341. I never attempt to be the life of the party.
342. Surf-board riding would be too dangerous for me.
343. If I am playing a game of skill, I attempt to plan each move thoroughly before acting.
344. I feel most worthwhile when I am helping someone who is disabled.
345. I rarely clean out my bureau drawers.
346. If I didn't have to earn a living, I would spend most of my time just having fun.
347. I don't like the feeling of wind in my hair.
348. I don't try to "keep up with the Joneses."
349. I like to be with people who assume a protective attitude toward me.
350. I like to read several books on one topic at the same time.
351. I wear clothes when I am around other people.
352. I believe people tell lies any time it is to their advantage.
353. I let people get ahead of me when waiting in a line since they probably have something more important to do than I do.
354. Sometimes people say I neglect other important aspects of my life because I work so hard.
355. I want to remain unhampered by obligations to friends.
356. I have a violent temper.
357. To have a sense of belonging is very important to me.
358. I like to change the pictures on my walls frequently.
359. I like the adventure of going into a new situation without knowing what might happen.
360. I don't mind answering questions about my family or friends when applying for a job.
361. I try to convince others to accept my political principles.
362. I am easily distracted when I am tired.
363. When I was in school, I often talked back to the teacher to make the other children laugh.
364. I would like to drive a motorcycle.
365. Most people feel that I act spontaneously.
366. I become irritated when I must interrupt my activities to do a favor for someone.
367. I keep my possessions in such good order that I have no trouble finding anything.
368. I usually have some reason for the things I do rather than just doing them for my own amusement.
369. Certain pieces of music remind me of pictures or moving patterns of color.
370. I would not consider myself a success unless other people viewed me as such.
371. I am usually very self-sufficient.
372. I would rather build something with my hands than try to develop scientific theories.
373. I can't believe that wood really burns.
374. Rarely, if ever, has the sight of food made me ill.
375. I don't particularly enjoy being the object of someone's jokes.
376. I am sure people think that I don't have a great deal of drive.
377. I spend a lot of time visiting friends.
378. I do not think it is necessary to step on others in order to get ahead in the world.
379. Having a home has a tendency to tie a person down more than I would like.
380. When I was in school, I preferred to work on one subject until I had finished the assignment.
381. Each day I check the weather report so that I will know what to wear.
382. I deliberately keep people from getting to know me too well.
383. I would not want to have a job enforcing the law.
384. I won't leave a project unfinished even if I am very tired.

385. I don't like to do anything unusual that will call attention to myself.

386. I will not climb a ladder unless someone is there to steady it for me.

387. I think that people who fall in love impulsively are quite immature.

388. Seeing an old or helpless person makes me feel that I would like to take care of him.

389. I feel comfortable in a somewhat disorganized room.

390. I delight in playing silly little tricks on people.

391. I am not very good at describing things.

392. When I am being introduced, I don't like the person to make lengthy comments about what I have done.

393. When I was a child, I usually went to an adult for protection if another child threatened me.

394. I am unable to think of anything that I wouldn't enjoy learning about.

395. I can run a mile in less than four minutes.

396. I find it very difficult to concentrate.

397. I am only worthy of an inferior position in most groups.

398. I enjoy work more than play.

399. I am quite independent of the people I know.

400. I often quarrel with others.

401. I can do my best work when I have the encouragement of others.

402. I would rather make new and different friends than spend my time with old friends.

403. Once in a while I like to take a chance on something that isn't sure — such as gambling.

404. Most of the criticism I receive can be used to my advantage by helping me to improve myself.

405. With a little effort, I can "wrap most people around my little finger."

406. When I feel ill, I stop working and try to get some rest.

407. I perform in public whenever I have the opportunity.

408. I like the feeling of speed.

409. Life is no fun unless it is lived in a carefree way.

410. It doesn't affect me one way or another to see a child being spanked.

411. I can't stand reading a newspaper that has been messed up.

412. I would prefer a quiet evening with friends to a loud party.

413. I like to feel sculptured objects.

414. I do a good job more to gain approval than because I like my work.

415. I prefer to take care of things for myself, rather than have others watch out for me.

416. There are many activities that I prefer to reading.

417. I would have a hard time keeping my mind a complete blank.

418. I am always prepared to do what is expected of me.

419. If my house were robbed, I would insist that the police make every effort to catch the thief.

420. It is unrealistic for me to insist on becoming the best in my field of work all of the time.

421. I go out of my way to meet people.

422. I try to show self-restraint to avoid hurting other people.

423. My idea of an ideal marriage is one where the two people remain as independent as if they were single.

424. I like to go to stores with which I am quite familiar.

425. I have no use for theories which are only good guesses and are not closely tied to facts.

426. If someone accused me of making a mistake, I would call his attention to a few mistakes of his own.

427. I don't have a forceful or dominating personality.

428. I am very persistent and efficient even when I have been working for many hours without rest.

429. The idea of acting in front of a large group doesn't appeal to me.

430. To me, it seems foolish to ski when so many people get hurt that way.

431. I like to take care of things one at a time.

432. I can remember that as a child I tried to take care of anyone who was sick.

433. If I have brought something home, I often drop it on a chair or table as I enter.

434. Things that would annoy most people seem humorous to me.

435. I would never spend my money to have a steam bath.

436. Inner satisfaction rather than fame is my goal in life.

437. I usually feel insecure unless I am near someone whom I can ask for support.

438. If I were going to an art exhibit, I would first try to learn about the artist, his style and technique, his philosophy of art, and the story behind each piece of work.

439. I am able to breathe.

440. Many things make me feel uneasy.

NAME (Please print) ____ AGE ____ SEX (Circle one) M F ____ DATE ____ FORM (Circle one) AA BB ____ OTHER INFORMATION ____

PERSONALITY RESEARCH FORM

DIRECTIONS: Place your name, age, sex, date of testing, and the form administered (AA or BB) in the spaces provided above. The answer boxes below are numbered the same as the statements in the booklet. Answer each statement by placing an X in either the true (T) or the false (F) box as shown in the example.

EXAMPLE

	1	2	3
T	X		
F			

BEGIN HERE

T / F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
T / F	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88
T / F	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132
T / F	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176
T / F	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
T / F	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264
T / F	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308
T / F	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352
T / F	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396
T / F	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440

RESEARCH PSYCHOLOGISTS PRESS, INC.

Ab	Ac	Af	Ag	Au	Ch	Cs	De	Do	En	Ex	Ha	Im	Nu	Or	Pl	Se	Sr	Su	Un	In	Dy

Appendix D.

PRF Scales means (Significant scales with *)

PRF Scale	CHD	Non Psychosomatic	Asthma	Ulcer	Healthy	F value	Tail Probability
AB	6.14	6.42	4.78	5.71	6.14	.72	.57
AC	15.07	13.50	12.07	13.85	13.28	1.23	.30
AF	12.28	12.57	13.00	12.57	12.42	0.07	.99
AG*	7.50	5.57	6.00	8.64	5.28	2.13	.08
AU	9.64	9.21	8.28	9.00	8.35	.43	.78
CH*	10.71	9.57	7.50	8.71	7.21	2.19	.07
CS	13.00	13.71	12.42	13.00	14.21	.59	.67
DE	10.14	9.28	8.42	9.64	7.92	1.14	.34
DO*	11.85	10.71	6.71	11.00	9.50	2.66	.04
EN	14.42	12.78	11.28	11.57	11.64	1.99	.10
EX	8.71	7.64	7.42	7.71	7.42	.24	.91
HA*	7.92	10.92	12.71	12.92	12.28	3.49	.01
IM	10.14	7.07	7.92	8.42	7.21	1.94	.11
NU	11.92	14.42	13.42	13.42	12.64	1.25	.29
OR	10.00	12.35	11.28	12.14	12.64	.92	.45
PL	9.78	8.64	8.35	9.21	9.07	.43	.78
SE	14.42	13.64	13.07	13.50	13.71	.42	.79
SR	8.85	9.92	10.14	10.71	9.85	.28	.88
SU	5.92	8.28	8.64	8.28	8.64	1.40	.24
UN	12.28	12.00	12.21	11.42	11.21	.31	.87
IN	.92	.42	.64	1.00	.50	1.07	.37
DY	15.40	14.92	14.14	14.14	15.14	.56	.69

Appendix E.

Intercorrelations among J.A.S. scales.

Intercorrelations among J.A.S. scales in the present study.

	AJAS	SJAS	JJAS	HJAS
AJAS				
SJAS	.60			
JJAS	.20	.18		
HJAS	.64	.27	.04	

Intercorrelations among J.A.S. scales in J.A.S. Mannual.

	AJAS	SJAS	JJAS	HJAS
AJAS				
AJAS	.67			
JJAS	.42	.27		
HJAS	.58	.22	.19	

	A	S	J	H	AB	AC	AF	AG	AU	CH	CS	DE	DO
A	X	.60	.20	.64	-.19	.46	-.14	.40	.13	.16	00	.32	.44
S	.60	X	.18	.27	-.07	.15	-.16	.61	.23	.13	-.20	.32	.26
J	.20	.18	X	.03	-.17	.42	.17	.10	.11	.29	-.07	.06	.47
H	.64	.27	.03	X	-.12	.36	-.07	.29	.02	-.01	.15	.28	.32
AB	-.19	-.07	-.17	-.12	X	-.09	.14	-.24	-.27	-.03	-.10	-.30	-.32
AC	.46	.16	.42	.36	-.09	X	.07	.08	.24	.27	-.08	.15	.35
AF	-.14	-.16	.12	-.07	.14	.07	X	-.15	-.44	.09	-.15	-.14	.06
AF	.40	.61	.10	.28	-.24	.08	-.15	X	.32	.30	-.07	.62	.44
AV	.13	.23	.11	.02	-.28	.24	-.46	.32	X	.42	-.18	.30	.14
CH	.16	.13	.29	-.01	-.04	.27	-.08	.30	.42	X	-.32	.37	.34
CS	00	-.20	-.07	.15	-.10	-.07	-.16	-.07	-.18	-.32	X	-.09	.01
DE	.32	.32	.05	.28	-.30	.15	-.14	.62	.30	.37	-.09	X	.41
DO	.44	.26	.47	.32	-.32	.35	.06	.44	.14	.34	.01	.41	X
EN	.22	.03	.34	.06	-.01	.66	-.03	-.15	.34	.17	-.01	00	.21
EX	.33	.30	.40	.15	-.26	.13	.35	.40	-.04	.24	-.28	.17	.56
HA	-.17	-.22	-.31	.11	.08	-.23	-.07	-.16	-.41	-.56	.45	-.15	-.30
IM	.22	.37	.32	-.05	.02	.16	.26	.25	.07	.47	-.58	.15	.19
NU	-.02	-.21	.10	.04	.17	.24	.47	.11	-.35	-.07	-.03	-.14	.17
OR	.13	-.01	-.08	.28	.00	.05	-.02	.04	-.18	-.31	.60	-.07	.00
PL	-.15	.08	.18	-.22	-.07	-.16	.40	.25	-.11	.31	-.29	.12	.23
SL	.12	-.01	.32	.01	-.09	.24	.06	-.02	.11	.39	-.11	.01	.22
SR	.15	.08	.12	.20	-.08	-.12	.45	.31	-.42	-.11	.00	.28	.30
SU	-.08	-.19	.16	.19	.32	-.22	.36	-.12	-.60	-.25	.01	-.17	-.10
VN	.08	.05	.34	-.08	.02	.36	.06	-.04	.18	.37	-.30	.05	.06
IN	.16	.26	-.03	.05	-.07	.13	.05	-.28	.10	.10	-.16	.21	.02
DY	.07	-.08	.45	-.01	-.13	.38	.26	-.27	-.10	.00	-.08	-.21	.40

Appendix F

Correlation matrix of J.A.S

EN	EX	HA	IM	NU	OR	PL	SE	SR	SU	UN	IN	DY
.22	.33	-.17	.22	-.02	.13	-.15	.12	.15	-.08	.08	.16	.07
.03	.30	-.22	.37	-.21	-.01	.09	.02	.09	-.19	.05	.26	-.08
.34	.40	-.31	.32	.10	-.08	.18	.32	.12	-.16	.34	-.03	.44
.07	.15	.11	-.05	.04	.28	-.22	.00	.20	.19	-.08	.04	.00
.00	-.26	.08	.02	.17	.00	-.07	-.09	-.08	.32	.02	-.07	-.13
.66	.13	-.23	.16	.24	.05	-.16	.24	-.12	-.22	.36	.13	.38
-.03	.34	-.07	.26	.47	-.02	.40	.06	.45	.36	.06	.05	.26
-.15	.40	-.15	.25	-.11	.05	.25	.02	.31	-.12	-.04	.28	-.27
.33	-.04	-.41	.07	-.35	-.18	-.11	.11	-.42	-.60	.18	.11	-.10
.17	.24	-.56	.48	-.07	-.30	.32	.39	-.11	-.25	.37	.10	.00
-.01	-.28	.45	-.58	-.03	.60	-.29	-.11	.00	.01	-.31	-.16	-.09
.00	.17	-.15	.15	-.13	-.07	.12	.01	.28	-.17	.05	.20	-.20
.21	.56	-.30	.19	.17	.09	.23	.22	.30	-.09	.06	.01	.40
X	-.04	-.26	.02	.16	.06	-.24	.19	-.35	-.36	.35	.09	.32
-.03	X	-.38	.48	.14	-.06	.48	.33	.48	.12	.15	.08	.29
-.25	-.38	X	-.49	.17	.43	-.40	-.35	-.05	.35	-.29	-.01	-.23
.02	.48	-.49	X	.00	-.32	.46	.23	.17	.00	.25	.13	.04
.16	.14	.17	.00	X	.21	-.02	.00	.33	.39	.17	-.01	.22
.06	-.06	.43	-.32	.21	X	-.35	-.12	.14	.12	-.20	.02	.02
-.24	.48	-.39	.46	-.02	-.35	X	.28	.38	.10	-.04	.03	.01
.19	.33	-.35	.23	.00	-.12	.28	X	.00	.00	.43	-.02	.27
-.35	.48	-.05	.17	.32	.14	.38	.00	X	.44	-.14	-.01	.00
-.36	.12	.35	.00	.39	.12	.10	.00	.44	X	-.08	-.31	-.18
.35	.15	-.29	.25	.17	-.20	-.03	.44	-.14	-.08	X	-.11	.24
.08	.08	-.01	.13	.01	.02	.02	-.02	-.01	-.31	-.11	X	.01
.32	.29	-.23	.05	.22	.02	.01	.27	.00	-.18	.24	.01	X

A = Type A scale
S = Speed and impatience scale
J = Job involvement scale
H = Hard driving scale

PRF Scales

17 JAN 1984