A PSYCHOMETRIC INVESTIGATION OF THE PERSONALITY TRAITS OF A GROUP OF MIGRAINE SUFFERERS

by

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ABSTRACT

The aim of this study is to investigate the personality traits of a group of migraine sufferers using the psychometric method. The migraine, normal and psychosomatic control groups were tested on the Hysteroid-Obsessoid Questionnaire, the California Psychological Inventory and the Sixteen Personality Factor Test. The results indicate that the three groups do not differ significantly in terms of scores obtained on any of the three tests.

The results are interpreted in terms of previous studies. In certain instances they are similar to those obtained in other studies. Where the results of this study differ from those of previous studies, these differences are interpreted in terms of sample differences and differences in the nature of the measuring instruments. The results are also interpreted in terms of recent re-evaluations of concepts in psychosomatic medicine and migraine research. Two alternative approaches are suggested for future research. It is suggested that researchers attempt to identify whether meaningful differentiations exist within the migraine population. It is also suggested that researchers adopt a situationally based approach to the understanding of the personality of migraine sufferers.

RESEARCH SUMMARY

INTRODUCTION

The Ad Hoc Committee on the Classification of Headache of the National Institute of Neurological Diseases and Blindness (1962) defined migraine as ". . . recurrent attacks of headaches, widely varied in intensity, frequency and duration. The attacks are commonly unilateral in onset, are usually associated with nausea and vomitting, in some are preceded by or associated with sensory, motor and mood disturbances, and are often familial." (quoted in Bakal, 1975, p.369). Migraine is listed by DSM-II (1968) a s a cardiovascular psychophysiologic disorder. Such disorders are true bodily diseases in which psychological factors are thought to play an aetiological role (DSM-II, 1968). According to Maher (1966) a characteristic of such disorders is that comprehensive treatment often incorporates both psychological and physical methods. This is true of migraine, where treatment has included chemotherapy, behaviour therapy, psychotherapy and psychoanalysis. (Bakal, 1975; Lambley, 1976).

The Concept of Psychosomatic Specificity

A recurrent issue in psychosomatic specificity is that of "psychosomatic specificity" and is concerned with identifying factors involved in symptom "choice". (Reiser, 1975). The questions asked are "What determines whether a person falls ill of one disease rather than another?" and "...do specific factors constitute necessary and/or sufficient factors in

determining choice of organ system and disease?" (Reiser, 1975, p.479). One aspect of the specificity concept that has received considerable attention is that of the enduring personality characteristics of individuals suffering from psychosomatic disorders. This research began in the 1940's within the framework of psychoanalysis and aimed at identifying the specific elements in the personality structures of patients that could be aetiological factors in psychosomatic disorders and contribute to symptom choice. (Reiser, 1975). Their research grew out of the observations of clinicians which suggested that certain personality characteristics were commonly associated with specific disorders. (Grinder, 1953, 1973).

The first to formalize these observations was Dunbar (1947) although the major research impetus came from the Chicago Institute for Psychoanalysis under the auspices of Franz Alexander. They studied a variety of psychosomatic disorders including migraine. (Alexander, 1952). For each disorder there was formulated a specific psychodynamic constellation, as well as a specific onset situation and constitutional vulnerability. The focus was not on observable personality traits but on the underlying conflicts. A central postulate of the theory was that specific internal organs are affected by specific emotions and conflicts. The formulations have been criticised for their reliance on subjective inference instead of observable personality traits and for the absence of suitable control groups. (Buss, 1966). The formulations of the Chicago group

have, however, stimulated a great deal of research, some of which has verified them and some of which has refuted them. (Buss, 1966; Reiser, 1975).

Another major influence in this area of research was H.G. Wolff (1955). According to Wolff (1955) psychosomatic disorders arise as part of an individual's inherited mode of physiological response to stress. Concomitant with such a somatic response the individual experiences an associated and consistent emotional tone and attitude. Thus, when Wolff (1955) referred to "ulcerative colitis types" or "migraine types" he was referring to individuals who react to stress with a particular constellation of bodily changes, feelings or attitudes. Wolff (1955) used a variety of psychosomatic measurement techniques to record the physiological activity of body organs during different psychological states. The heart rhythm of cardiac patients was, for example, recorded by ECG whilst the patients discussed stressful incidents. Two students of Wolff's - Grace and Graham (1952) formulated a derivative hypothesis which they called "specificity of attitude" hypothesis. According to this hypothesis there is, associated with each psychosomatic disorder a specific attitude towards the life events that precipitate and/or exacerbate the symptoms. Attitude in this sense refers to what the individual thinks is about to happen to him and what he wants to do about it. The hypothesis led to a series of research whereby attitudes were hypnotically induced and concomitant physiological reactions measured. The

hypothesis is partly borne out by the findings that different attitudes elicit different physiological responses, but is partly refuted by the finding that the same physiological response can be elicited by more than one attitude. (Buss, 1966).

The research cited above incorporates a broadly based approach to psychosomatic disorders in general. Subsequent research has focused on specific disorders. At present the association between specific psychological characteristics remains unclear. Patients suffering from such disorders continue to be described in terms compatible with those used by earlier "specificity theorists". Patients suffering from ulcerative colitis, for example, are described as characteristically passive, conforming and dependent personalities. (Wijsenbeek et al, 1968; McMahon et al, 1973). At the same time there appears to be considerable variation amongst the personality characteristics of individuals suffering from the same disorder as well as overlap between the characteristics of those suffering from different disorders. (Engel, 1975; Reiser, 1975). According to Mendelsohn et al (1968), this confusion stems from a lack of research utilizing appropriate objective recording and/or observational techniques and control procedures, with a resultant tendency towards the biased selection of data. Kimball (1975) attributes the confusion to a lack of a clear definition of what is meant by personality.

Migraine and Psychosomatic Specificity

Migraine was one of the first disorders for which researchers attempted to identify associated personality traits. Studies based on clinical observation began in the 1930's and since then have developed the picture of migraine sufferers as characteristically obsessional personalities with tendencies towards perfectionism, orderliness, meticulousness, inflexibility and rigidity. They are also purported to display a great need for achievement. Social relationships are superficial and emphasise protocol, with little room for spontaneity. Sexual adjustment is poor. Anger and hostility are "bottled up" and not expressed. (Knopf, 1934; Fromm-Reichmann, 1937; Wolff, 1937, 1963; Friedmann, 1954; Friedman et al, 1954; Selby and Lance, 1960; Kolb, 1963; Paulley and Maskell, 1975). Not all migraine sufferers, however, fitted the characteristic descriptions. (Friedman, 1954; Wolff, 1937, 1963). Neither are the personality traits attributed to migraine sufferers necessarily exclusive to this group. (Friedman et al, 1954). Several psychometric studies have been conducted in an attempt to establish whether the association between migraine and certain personality traits is significant. Ross and McNaughton (1954) administered the Rorschach to migraine sufferers as well as to several other clinical groups and a normal control group. The results of their study indicated that migraine sufferers scored significantly higher on indices of obsessionality than any control group.

Subsequent research has identified the differences between migraine sufferers and control groups mainly in terms of anxiety and neuroticism. Even here results appear contradictory. Maxwell (1966) administered the Eysenck Personality Inventory (EPI) to a group of migraine sufferers as well as to two other groups of patients visiting their doctor frequently. The migraine sufferers were found to score significantly higher than either control group on a Neuroticism as measured by the EPI. Gutt and Rees (1973) also administered the EPI to migraine sufferers and various control groups and found that migraine sufferers obtained significantly higher scores than control groups on the Neuroticism Scale. Philips (1976) on the other hand, administered the EPI to a group of migraine sufferers as well as to individuals receiving treatment for non-migrainous headache and found no significant differences between the groups on test scores. Similarly Waters and O'Connor (1970) administered the Cornell Medical Index to measure psychoneurosis in migraine and non-migraine headache groups and found no significant differences between the groups.

A possible reason for these apparently contradictory results may lie in sample differences. Gutt and Rees (1973) and Philips (1975) found that subjects receiving more intensive treatment for migraine, such as those attending an hospital migraine clinic, obtained significantly higher neuroticism scores on the EPI than other migraine sufferers. This may be a

characteristic of those individuals seeking more intensive treatment, or it may be an effect of such treatment. In either event the findings do suggest that the nature of treatment received is a potentially confounding variable in migraine research. Since other researchers have not controlled for treatment received, it is possible that this at least partially accounts for the discrepancy between results.

The clinical observational studies referred to more enduring personality traits. The tests used in the psychometric studies are however, with the exception of the Rorschach used by Ross and McNaughton (1954), linked to the measurement of neurotic symptomatology. An increase in neuroticism could be expected as a response to any illness and may well be a function of variables such as frequency and intensity of symptoms as opposed to type of disorder. It has already been mentioned that some overlap exists in the descriptions of individuals suffering from different psychosomatic disorders. Ulcerative colitis patients have, for example, also been described as typical obsessional personalities. (Engel, 1975). A further limitation of the cited research is that, except in the case of the asthmatics tested by Gutt and Rees (1973), control groups did not include individuals suffering from psychosomatic disorders other than migraine.

AIMS OF THIS STUDY

1. To investigate whether certain personality traits, as measured by three psychometric instruments, are significantly associated with a specific psychosomatic disorder, that is, migraine.

2. To use tests covering a broader range of aspects of inter- and intra-personal psychological functioning than those used in previous studies, where the main concern has been to measure anxiety and neuroticism. The tests used are self-report inventories and measure, amongst others, specifically those traits that have often been found to be associated with migraine in other studies.

3. To introduce two control procedures absent from most other studies in this field. These are the inclusion of a psychosomatic control group and control for the nature of treatment received.

NULL HYPOTHESES

1. There is no significant difference between migraine sufferers and normal controls in terms of:

   a. obsessoid personality traits as measured by the Hysteroid-Obsessoid Questionnaire.

   b. interpersonal functioning as measured by the California Psychological Inventory.

   c. personality traits as measured by the Sixteen Personality Factor Test (16PF).

2. There is no significant difference between migraine sufferers and psychosomatic controls in terms of:

   a. obsessoid personality traits as measured by the Hysteroid-Obsessoid Questionnaire.

   b. interpersonal functioning as measured by the California Psychological Inventory.

   c. personality traits as measured by the Sixteen Personality Factor Questionnaire.

3. There is no significant difference between normal controls and psychosomatic controls in terms of:

   a. obsessoid personality traits as measured by the Hysteroid-Obsessoid Questionnaire.

b. interpersonal functioning as measured by the California Psychological Inventory.

c. Personality traits as measured by the Sixteen Personality Factor Questionnaire.

PROCEDURE

Subjects:

Three groups of subjects were used, a Migraine Group, Psychosomatic-Control Group and Normal-Control Group. Normal in this context refers simply to the absence of known psychosomatic disorder. In order to be included in any group subjects had to be:

1. Female
2. Between the ages of 18 - 30 years
3. White
4. Matriculated
5. Within Class I - III of the Social Class Scale.

Migraine Group

Subjects who reported that they suffered from migraine were asked to fill out a questionnaire regarding their symptoms. The diagnostic features used were those listed by the Ad Hoc Committee on Classification of Headache (1962):

1. Unilateral Headache
2. Anorexia
3. Nausea
4. Vomiting
5. Headache preceded or accompanied by sensory and/or motor disturbance.

There is no information in the literature as to which and how many symptoms are necessary and/or sufficient to establish a diagnosis. This study, following Phillips (1975) assumed a

diagnosis on the basis of two or more questions. The format of questions was taken from the Migraine Questionnaire of Waters and O'Connor (1970). Information regarding type of medication used, previous diagnosis and familial history of migraine was regarded as corroborating evidence for the diagnosis.

Subjects were excluded where there was a known organic aetiology such as head injury; where migraine was mainly premenstrual or clearly associated with the menstrual cycle; Subjects attending hospital clinics for migraine and those receiving psychotherapy and/or psychiatric treatment were also excluded.

Psychosomatic Control Group

Reported previous medical diagnosis of a psychosomatic disorder was the main criterion for inclusion in this group. The group consisted of:

1. 12 asthmatics
2. 10 subjects suffering from neurodermatitis (including eczema and urticaria).
3. 7 subjects suffering from ulcers
4. 1 subject suffering from ulcerative colitis
5. 1 subject suffering from spastic colon.

Subjects receiving psychological or psyciatric treatment were excluded.

Normal Control Group

Subjects in this group reported no known psychosomatic disorders. Subjects receiving psychological or psychiatric treatment were

excluded. A hospital sample was avoided.

Tests

Subjects were given a battery of three psychological tests to complete at home.

Hysteroid-Obsessoid Questionnaire (HOQ)

The HOQ is designed to measure those traits associated with hysteroid and obsessoid personalities. The terms hysterical and obsessional have been avoided so as to avoid confusion between the personality traits and hysterical and obsessional symptoms. The HOQ consists of 48 descriptive statements which are marked True or False depending on whether or not the individual feels they apply to him. An advantage of the HOQ is that scores on the Hysteroid and Obsessoid scales have been shown to be independent of psychopathology. (Caine and Hope, 1967).

The California Psychological Inventory (CPI)

The CPI is a self-report inventory concerned mainly with the measurement of "... personality characteristics important for social living and social interaction." (Gough, 1960, p.5). An advantage of the test is that scores on several of the 18 sub-scales should enable the researcher to identify the obsessional personalities often held to be associated with migraine. Other advantages of the test are the size and variability of the norm groups, the great amount of empirical research that has

accumulated and its predictive validity. (Anastasi, 1968).

Sixteen Personality Factor Test (Form A (16PF)

The 16PF was designed to be a comprehensive test of fundamental personality traits. It is a test of proven reliability and validity, covering a broad range of personality traits and accompanied by a great deal of empirical information. Amongst the traits measured are those that have been frequently used in descriptions of migraine sufferers, such as sober, conscientious, controlled, conservative and tense.

STATISTICAL ANALYSIS

Data from the HOQ was analyzed using Analysis of Variance (ANOVA). Data obtained on the CPI and 16PF was first analyzed using the Multivariate Analysis of Variance (MANOVA). MANOVA is an extension of ANOVA which is used when one is comparing groups on more than one dependent variable. It allows for possible dependence amongst measures as would not happen if several separate ANOVAs were calculated. It assumes variables to be normally distributed and is based on an U- statistic with 3 degrees of freedom which is transformed into an F- statistic with 2 degrees of freedom. This is then compared with the F- tables. MANOVA was used to establish whether the groups differed on each test taken as a whole, that is on all factors of the test simultaneously. Calculations were done on an UNIVAC package BMD 12V.

Following MANOVA, ANOVAs were calculated for each score separately. This was done to establish whether the three groups differed significantly on any score independently of the others' scores on that test. Where such differences were found Multiple Comparisons were calculated to establish where the difference lay. In two instances Tukey T- Pairwise Comparisons located the difference. In the third instance the difference was located using Scheffé Multiple Comparisons.

RESULTS

No significant differences were found between the migraine and psychosomatic control groups in terms of scores on the HOQ, CPI and 16PF. No significant differences were found between the migraine and normal control groups in terms of scores on the HOQ and CPI.

No significant differences were found between the migraine and normal control groups in terms of scores on the 16PF when the MANOVA statistic was applied. This statistic is designed to detect overall differences in test profiles. However, when separate ANOVAs were calculated for each factor the migraine group obtained scores significantly lower than the normal control group on Factors C and F ($p = .05$). Factor C is regarded as a measure of "ego strength" and Factor F as a measure of "surgency". Low scores on "surgency" have been described as "sober, taciturn and serious". (Cattell et al, 1970, p.87). No significant differences were found between the normal and psychosomatic control groups in terms of scores on the HOQ and CPI.

No significant differences were found between normal and psychosomatic control groups on scores on the 16PF when the MANOVA statistic was applied. When the separate ANOVAs were calculated for each factor, the migraine and psychosomatic control groups combined obtained significantly higher scores than the normal controls on Factor Q4 of the 16PF. A high score on this factor is thought to indicate a person who is tense and fretful. (Cattell et al, 1970). It must be noted that where a significant difference between the groups does exist, none of the group means deviate by more

than one point from the mean of the norm population. In terms of the criteria laid down in the manual, this indicates that the means deviate only slightly from the norm means, and that no group's score on any of the factors should therefore be considered pathological.

Furthermore, the fact that the groups differed significantly on only 3 out of 35 scores suggests, that despite the differences found, the groups do not differ in overall psychological functioning. This is further borne out by the fact that the differences were only detected when separate ANOVAs were calculated for each score separately. The MANOVA statistic, designed to detect overall differences in test profile and therefore personality functioning, did not detect such differences.

In view of the points made above, the results will be taken to indicate that despite differing from normal controls on two isolated traits, migraine sufferers do not differ from normal or psuchosomatic controls in terms of overall personality functioning. More to the point, migraine sufferers were found to be no more obsessional than either control group.

Discussion of Results

The results of this study indicate that there are no overall significant differences between the migraine, psychosomatic and normal control groups used in this study in terms of scores

on the HOQ, CPI and 16PF. The results of this study are compatible with certain observations regarding the clinical-observational studies - most notably the fact that not all migraine sufferers were found to fit the descriptions given. (Rees, 1973). The results are also compatible with those of Philips (1975) and Walters and O'Connor (1970) who found no significant differences between migraine sufferers and various control groups in terms of scores on the EPI.

Differences between the results of this study and those of Ross and McNaughton (1945), who obtained significant differences between migraine sufferers and control groups in terms of indices of obsessionality on the Rorschach, may be due to sample differences. The migraine sufferers tested by Ross and McNaughton (1945) appear to have included a large proportion of hospital patients (exact figure not given), whereas in this study a hospital sample was excluded.

The differences in results obtained between this study and those of Gutt and Rees (1973) and Maxwell (1960), who obtained significant differences between migraine sufferers and controls in terms of scores on tests of anxiety and neuroticism, may result from differences in the nature of the measuring instruments. Gutt and Rees (1973) and Maxwell (1966) were concerned with measure of psychopathology, whereas this study was concerned with the measure of more enduring personality traits.

The results of this study are also compatible with recent thiking in psychosomatic medicine. It has been suggested that the psychosomatic concept applies not to a specific category of disease, but to an approach to the aetiology and maintenance of all disease. (Lipowski, 1977; Weiss, 1977). If such thinking is correct, there are no grounds on which to expect to be able to identify a group specifically regarded as sufferers of psychosomatic disorders.

The results of this study were obtained on groups of migraine sufferers and controls restricted to a considerable extent by criteria for inclusion. As such the results cannot be generalized to other groups with a great degree of confidence. The results do, however, suggest alternative approaches to migraine research:

1. Bakal (1975) suggests that in the absence of being able to identify a migrainous personality, researchers adopt a situationally based approach to personality. By adopting such an approach researchers would not be concerned with the personality traits of migraine sufferers in isolation, but with the way in which such traits might interact with situational variables to precipitate and/or maintain migraine. The first step towards the development of such an approach would be to identify the dimensions of the social environment associated with migraine. Advances in social environmental research have enabled researchers to identify the situational variables associated with various aspects of psychosomatic functioning. (Kiritz and Moos, 1974).

It should be possible to extend this research to identify the environmental variables associated with migraine.

2. Investigate whether migraine exists as an unitary concept or whether there exist meaningful differentiations within the migraine population. Migraine is treated as a single entity in this research. It has been suggested, however, that migraine sufferers may be differentiated on the basis of symptomatology (Graham, 1965) and in terms of the function of the migraine within the inter and intra-personal systems of the individual. (Sacks, 1970). No objective evidence is present as yet for these differentiations. There is, however, evidence to indicate that differences exist between those migraine sufferers attending hospital clinics and those who do not. (Rees, 1973; Philips, 1976). The nature of such differences and others which may exist have not yet been explored.

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CHAPTER I

THE CONCEPT OF PSYCHOSOMATIC/ PSYCHOPHYSIOLOGICAL DISORDER

The terms "phychosomatic disorder" and "psychophysiological disorder" refer to the same phenomena. Although the Diagnostic and Statistical Manual of Mental Disorders of the American Psychiatric Association (DSM-II, 1968) refers to "psychophysiciological disorders" the bulk of available literature refers to "psychosomatic disorders". Thus, for the sake of convenience the term "psychosomatic disorder" will be used unless discussing DSM-II (1968) definitions.

This chapter deals with the concept of psychosomatic disorder. The introduction deals with the definition of the concept, its range and implications. Metatheoretical considerations are also dealt with, albeit very briefly. The aim of the metatheoretical section is to merely outline current thinking pertinent to the conceptualization of psychosomatic disorders. Thereafter the problem of symptom "choice" is delineated and the relevant theories and research are reviewed. The review is broadly based, with no emphasis being given to specific disorders, unless this is done to illustrate a point. Only the essential features of the theories are dealt with. The various research paradigms are described and their advantages and limitations discussed.

The research data cited is not intended as a comprehensive survey of all available data, but has been chosen to illustrate the research paradigms.

Definition and Range

According to DSM-II psychophysiological disorders "... are characterized by physical symptoms that are caused by emotional factors and involve a single organ system, usually under control of the autonomic nervous system". (DSM-II, 1968, p.46).

Nine different types of psychophysiological disorder are listed by DSM-II. These are:

1. Psychophysiologic skin disorders.
2. Psychophysiologic respiratory disorders.
3. Psychophysiologic cardiovascular disorders.
4. Psychophysiologic hernic and lymphatic disorders.
5. Psychophysiologic gastro-intestinal disorders.
6. Psychophysiologic genital-urinary disorders.
7. Psychophysiologic endocrine disorders.
8. Psychophysiologic muskuloskeletal disorders.
9. Psychophysiolgic disorders of a sense organ.

The disorders listed are those traditionally regarded as being psychophysiological. Within the past few years, however, it has become increasingly recognized that psycho-social factors may play a role in the precipitation and/or maintenance of most diseases, including cancer. (Lipowski, 1977). On the basis of such research, Weiss (1977) differentiates between "psycho-

somatic disorder" as a specific nosological concept and as a more general approach to all disease. If the latter is accepted, the question changes from "which illnesses are psychosomatic?" to "To what extent is the incidence or course of a given illness a function of psychological variables?" (Weiss, 1977, p.167). A similar differentiation is made by Lipowski, (1977) who defines psychosomatic medicine as "a scientific discipline concerned with the study of the relationships of biological, psychological and social determinants of health and disease." (Lipowski, 1977, p.233). He goes on to stress that it is a "doctrine of the multi-causality of all disease." (Lipowski, 1977, p.234).

Having noted this broadening of the psychosomatic/psychophysiological concept, the rest of this chapter will deal with the theories and research data pertaining to it as a diagnostic category encompassing only those disorders specifically defined as such according to DSM-II (1968).

Implications of Definition

The implications of the official DSM-II (1968) definition become clearer if we look at two other, unofficial definitions. Psychosomatic disorders are defined as "...disorders of true bodily disease, and medical treatment is necessary to combat or alleviate them. However, a significant proportion of the determinants of the disorder are psychological, and the disorder is likely to return and persist if the psychological

problem is not resolved." (Maher, 1965, p.288). A similar definition is given by Halliday (1948, p.45) of "a bodily disorder whose nature can be appreciated only when emotional disturbances, that is, psychological happenings, are investigated in addition to physical disturbances, that is, somatic disturbances" (quoted in Buss, 1966, p.391).

There are several implications of the cited definitions:

1) Psychosomatic disorders are true bodily diseases. As such they can even result in death. In this respect they differ from hysterical or conversion reactions which can also involve bodily functions but where "minute examination of the malfunctioning organ reveals no physical defect at all." (Maher, 1967, p.238).

2) Medical treatment alone may be insufficient to treat the disorder and both medical and psychological treatment may be required. The psychosomatic approach is thus described as "A method of approach both in research and therapy aimed towards thesimultaneous and co-ordinated use of somatic and psychological methods and concepts." (Alexander and Flagg, 1971, p.860).

3) A multifactorial approach to aetiology is implied, involving both psychological and physical factors. This multifactorial approach has been stressed by many researchers, e.g. (Alexander and Flagg, 1971; Buss, 1966; Crown, 1975; Lambley, 1976; Price, 1974 and Rees, 1973) and has been

broadened to include environmental factors (Moos, 1974). These factors will be considered later in this chapter.

Metatheoretical Considerations

Much research aimed at identifying the aetiological factors involved in psychosomatic disorders is based on a linear-sequential-causal model. (Minuchin et al, 1975). Such a model links single causes to illness in a unidirectional causal chain. Aetiological factors are, however, measured at different levels of abstraction (e.g. the physiological and the psychological) and it is becoming increasingly recognized that a fully comprehensive approach to psychosomatic disorders must take into account not only the multiple aetiological factors but their mutual interaction with each other. (Engel, 1954; Lipowski, 1975; Minuchin et al, 1975; Lambley, 1976). This approach is derived largely from general systems theory and is summed up by Engels (1975)view that "no linear concept of aetiology is appropriate, but that rather the pathogenesis of disease involves a series of positive and negative feedbacks with multiple simultaneous and sequential changes potentially affecting any system of the body" (quoted in Witkower, 1977, p.9).

The concept of aetiological factors operating at multiple levels raises the age-old problem of the nature of mind-body interaction. Alexander and Flagg (1971) view the psychosomatic approach as a synthesis between what were once regarded

as opposing orientations - - the organic and the physiological. Similarly Reiser (1975) views psychosomatic disorders in terms of the "ultimate conviction that mind and body constitute a true functional unity." (Reiser, 1975, p.479). He goes on to add, however, that "... as observers, investigators and theorists we are obliged (whether we like it or not) to deal with data from two separate realms, one pertaining to mind and the other to body. The science of mind and the science of body utilize different languages, different concepts and different sets of tools and techniques." (Resier, 1975, p.480). Thus, a given state, for example, anxiety, may produce two different sets of descriptive data, measurements and formulations. There is not, as yet, a way of unifying them into a common language or by reference to a shared conceptual framework. Even if we accept, therefore, the concept of a unitary organism, with psychological and physical explanations of disease being different ways of describing the same events, we have to distinguish between them for the purposes of research.

Psychosomatic Specificity

Definition of Problem: A central issue has, for decades, been that of psychosomatic specificity. The questions asked are "what determines whether a person falls ill of one disease rather than another,?" and "do specific factors constitute necessary and/or sufficient factors in determining choice of

organ system and disease? (Reister, 1975, p.479).

For the sake of convenience theories attempting to answer the specificity questions are divided into those that are essentially biological and those that are essentially psychological. The highlights of each theory are dealt with, as are the basic research paradigms.

Biological Theories

Physique: Sheldon (1940) attempted to relate body build to psychosomatic disorder. He claimed that ulcer patients, for example, are endomorphic mesomorphs - that is, a combination of round, broad, fatty elements and athletic, muscular, strong elements. Brouwer (1957) tested this hypothesis with asthma ulcer patients and with normal controls. Differences between the groups in physique were small and random. Thus, notwithstanding the general theoretical and methodological criticisms of Sheldon's research, even research within his paradigm failed to confirm the proposed associations. Not much attention is currently paid to Sheldon's theory of psychosomatic disorder.

Somatic Weakness Theory:

According to this theory the connection between stress and a particular psychosomatic disorder lies in the weakness of a particular body organ. Symptom choice is then accounted for

in terms of the body's weak link, as it were. One method of testing this has been to obtain a retrospective medical history. Rees (1967) found that 80% of a group of asthmatics had a prior respiratory infection, in contrast to 30% of a group of non-asthmatics. The problem arises as to how this can be tested with other disorders. What disease, for example, would render an individual susceptible to essential hypertension? A further question arises as to what renders the affected organ vulnerable in the first place. It is possible that psychological factors play a role in the earliest stages of organ vulnerability. Ader (1967) for example, has developed several animal models of disease susceptibility in which experimental manipulation of infantile experience was shown to influence subsequent resistance to a number of "pathogenic challenges" including several viruses.

We must, then, consider whether those psychological factors contributing to the development of the original illness are the same as those contributing to the development of the subsequent psychosomatic disorder.

The theory that organ weakness is partly responsible for symptom location has common sense appeal and from a logical point of view seems a worthwhile focus of research. As we have seen, however, its vagueness makes it difficult to test and it is, by itself, insufficient as an explanation of symptom choice.

Theory of Inherited Autonomic Reactivity: This theory is, in a sense, a variant of the somatic weakness theory. It has the advantages of being more precise, therefore able to generate testable hypotheses. A further advantage is the availability of a technology whereby autonomic reactivity may be monitored.

A precursor of work in this area was H.G. Wolff (1950, 1953). According to Wolff (1950, 1953) an individual responds to stress with a preferred pattern of bodily response. The nature of the response is determined by hereditary and the response is an adaptive mechanism protecting the body against further damage. Such patterns may not be evident until a stress situation occurs - ". . . the individual and his clan meet life in a particular way different from other stocks. An individual may have been a potential 'nose reactor' or 'colon reactor' all his life without ever having actually called upon a particular protective pattern because he did not need to. A given protective pattern may remain inconspicuous during long periods of insecurity, and then, under stress, become evident as a disorder involving the gut, the heart and vascular system, the vaso-respiratory apparatus, the skin or general metabolism." (Wolff, 1953, p.35). Wolff (1953) utilized a variety of techniques to measure physiological responses to stress. Heart patients, for example, were asked to discuss distressful topics whilst their electro-cardiograms were recorded. A tube passed through the nasal passage was used to measure the gastric

activity of ulcer patients under various psychological conditions. Subsequent psychophysiological research has supported Wolff's (1953) theory of individual differences in reaction to stress. Lacey et al (1958, 1963) and Lacey (1967) found that most of their subjects manifest patterns of autonomic reactivity that are stable across situations. One subject might show, for example, the greatest reaction to stress by a rise in blood pressure, with lesser changes in heart rate and galvanic skin response. Another subject might react with the opposite autonomic pattern. The individual hierarchy of reactivity would show up regardless of the nature of the stressful stimuli used to induce the physiological changes. These findings are corroborated by those of Davis, Lundervold and Miller (1957) and also Wenger (1961), who points out that differences may also be partially attributable to the different measuring techniques used.

Research by Malmo and Shagass (1949) showed how such individual differences may be related to specific psychophysiological disorders. They found that patients with cardio-vascular symptoms react to stress with greater cardio-vascular responses than muscular responses, whereas headache patients react with the opposite pattern. A disadvantage of this type of study is that it is retrospective - such differences in reactivity may have developed as the results of illness.

Whilst the research cited does provide support for the theory of autonomic response specificity it does not indicate that

individual differences are inherited support for this comes from other research. Richmond and Lustman (1955), for example, recorded the autonomic reactions of neonates three to four days old. They found large, stable individual differences in circulatory and pupillary dilation to loud sounds. There thus appear to be clear-cut, identifiable patterns of autonomic reactivity prior to the impact of socialization. These are assumed to be inherited.

The assumption also receives support from Misky (1958) who demonstrated that ulcer formation is associated with an excessive secretion of pepsinogen. He also found that individual differences in pepsinogen level could be detected in neonates, the measurements being taken through the umbilical cord.

Whilst the studies cited appear to support the theory that patterns of autonomic reactivity to stress are inherited, we need to know more about the stability of the patterns over long periods of time. Specifically, we should ask whether these patterns cannot alter with the onset of psychosomatic disorder. Predictive studies, such as those of Mirsky (1958) would be useful in this regard. Mirsky (1958) first measured level of pepsinogen secretion in his subjects, then established what percentage of oversecretors and undersecretors developed ulcers after a time interval of several months of stress. Oversecretors developed significantly more ulcers than undersecretors. One disadvantage of Mirsky's study is that the time interval

was only a few months. It is possible that alterations to autonomic reactivity patterns occur some while before the clinical manifestation of a psychosomatic disorder. In order to rule out this possibility predictive studies would have to cover longer time spans.

Thus we can conclude that individuals do show differences in autonomic reactions to stress, that these differences appear to be inherited and that they do appear to be related to the development of specific psychosomatical disorders. The nature of the relationship needs further investigation and studies involving the measurement of autonomic reactions and development of psuchosomatic disorders over long periods of time are proposed as a research strategy for doing so.

Psychological Theories

Social Psychological Theories

Research in this area is aimed at identifying social-environmental factors associated with various kinds of illness, including psychosomatic disorders. One study, for example, examined the frequency of illness among the crew of naval ships and found it to be significantly related to type of duty. (Rubin, Gunderson & Dolly, 1969).

Within the field of social psychology techniques of social environmental measurements are being developed and refined. Moos (1974), for example, identifies and quantifies the

characteristics of social environments along three basic dimensions: a) relationship dimensions or the degree to which the environment precipitates involvement, affiliation, support, cohesion and expressiveness; b) personal development dimension or the degree of self-enhancement elicited by the environment; and c) system maintenance and system change dimension. Subdivisions within this category include order and organization, clarity and control, and work pressure. An extension of research in this area has been to examine the association between the nature of the social environment and physiological functioning. Kiritz and Moos (1974), for example, found that environments characterized by high responsibility and work pressure were correlated with an high incidence of coronary disease.

Research such as that of Rubin et al (1969) and Kiritz and Moos (1974) has important implications for environmental/organizational planning. It would therefore be useful to extend this research to identify the environmental variables associated with disorders other than coronary disease.

Learning Theories:

Research in this area is based on the theory that psychophysiological responses represent learned reactions to stimuli. Research has been conducted utilizing both classical and instrumental learning models.

The Classical Conditioning Model:

Here a stimulus is presented which will reliably elicit a psychophysiological response. This is the unconditioned stimulus (UCS). For example, an irritant is introduced that will elicit a skin eruption or that will make breathing difficult if diffused in the air. Paired with this UCS is the conditioned stimulus (CS) - a neutral stimulus that does not normally elicit the response. After sufficient pairings of the CS with the UCS, we observe the appearance of the response to the CS when it is presented alone. A good illustration of such research is provided by Ottenberg, Stein, Lewis and Hamilton (1958, 1961). They conditioned guinea-pigs to asthmatic breathing by pairing various neutral stimuli with egg-white spray - a stimulus known to elicit such breathing difficulties in the animals. Similarly, Bandura (1969) broadened the range of stimuli that could elicit asthma in a pollen allergic subject by pairing various neutral stimuli with pollen.

The classical conditioning model is useful in that it has led to the development of treatment techniques. Walton (1960a) for example, used systematic desensitization to decrease the frequency of asthma attacks. Whilst classical conditioning can be considered as an exacerbating factor in the development of psychophysiological disorders, it cannot be a direct cause since the response must exist in the individual's behavioural repertoire prior to the conditioning procedure.

Instrumental Learning

Available data here has been obtained from clinical case studies, where the aim is to identify and modify stimuli cuing and maintaining symptomatic behaviours so as to reinforce alternative behaviours. Walton (1960b), for example, describes the treatment of neuro-dermatitis in a 20-year old woman. Both family discussions of the patient's condition and the rubbing on of ointment by her boyfriend were identified as stimuli reinforcing the symptoms. Modification of their behaviour therefore resulted in the alleviation of the condition.

Behavioural studies such as those cited enable us to understand the development and maintenance of symptomatic behaviour in individual subjects. It would be interesting, however, to know whether individuals suffering from the same disorders have had similar learning experiences or whether they receive similar types of reinforcement for their symptomatic behaviour. Do patients suffering from neurodermatitis, for example, receive more tactile stimulation than peptic ulcer patients? This question could be partially answered by examining the range of behaviours most valued by patients suffering from such disorders. Wooley and Blackwell (1975) established, from a group of psychosomatic patients, an hierarchy of the types of behaviour they reinforced most frequently in others. It was found that caretaking behaviours were most frequently reinforced by these patients, whereas achievement behaviours were most frequently reinforced by the ward staff. It would be valuable to extend

this research to establish whether individuals suffering from different psyshosomatic disorders reinforce different types of behaviour in others.

Thus we can conclude that both the classical and instrumental learning models enable us to understand the way in which symptomatic behaviours are cued and maintained within the individual's behavioural repertoire. They do not, however, answer the specificity questions. That is they do not, as yet, explain why different groups of individuals develop different kinds of symptoms.

The Contribution of Psychoanalysis and Personality Theory

Within the disciplines of both psychoanalysis and psychology there began, in the 1940's and 1950's a series of research aimed at identifying the specific elements in the personality structure and psychological life of patients that could be aetological factors in psychosomatic disease and contribute to symptom choice (Reiser, 1975). The observations of clinicians working with patients suffering from psychosomatic disorders suggested that certain personality features were commonly characteristic of patients with specific disorders. (Grinker, 1953, 1973). Flanders Dunbar (1954) was one of the first to formalize these observations. She claimed to have established statistical correlations between specific psychosomatic diseases and personality characteristics. Although of historical significance, Dunbar's personality profiles are not regarded as

valid, and her research has been criticised on both theoretical and methodological grounds. (Reiser, 1975). A major criticism is the degree of overlap between the various personality profiles. From within the psychoanalytic camp there was also criticism of the emphasis on "external" personality characteristics or "superficial defenses". (Alexander and Flagg, 1965).

Franz Alexander (1950, 1965) has been a major influence in the attempt to identify the psychological correlates of psychosomatic disorder. This research began in the 1930's and continued until the mid-1960's. He and a group of associates began a series of psychoanalytic studies of patients suffering from chronic organic ailments in which emotional conflicts were thought to play an aetiological role. The disorders studied by Alexander's Chicago group were ulcers, asthma, rheumatoid arthritis, ulcerative colitis, essential hypertension, neurodermatitis and thyrotoxicosis. For each there was thought to be a specific psychodynamic constellation, as well as a specific "onset situation" and constitutional vulnerability.

Alexander et al (1975) postulated that the physiological changes accompanying the chronic emotions associated with unresolved conflicts would give rise first to altered functions within the appropriate organ systems and later, if sustained, to alterations in structure and disease. The sequence, simplified, becomes chronic conflict → specific chronic affect → associated chronic physiological concommitant → disease. A central postulate of

the theory is that specific internal organs are affected by specific emotions and conflicts.

In accordance with his criticism of Dunbar (1954), Alexander's focus was not on observable personality traits, but on underlying conflicts. Such conflicts could have different observable manifestations. Thus it was maintained that "although the personality profiles of two ulcer patients may be very different (one may be freedom loving and independent and the other openly dependent and demanding) the significant correlation is between the wish to receive love and help and the activity of the stomach". (Alexander and Flagg, 1965, p.865). The task of the researcher/clinician then becomes one of ignoring observable personality manifestations and inferring the underlying conflict. Whilst this may certainly be a useful approach within a therapeutic context, the reliance on subjective inference poses certain difficulties within the context of scientific research. It is difficult, for example, to see how such studies can be replicated, since no clear definition exists of what is being observed. Another methodological limitation was the absence of suitable control groups, e.g. of psychoneurotic patients.

Subsequent research has both verified and refuted Alexander's findings. This may be illustrated by the findings of two groups of researchers, both concerned with identifying the personality traits of ulcer patients: Weiner et al (1954) predicted the occurrence of peptic ulcer in a group of 2073 army

draftees, Independent evaluation of psychological data, including Rorschach and Blacky Picture Test profiles "revealed that subjects with peptic ulcer displayed evidence of major unresolved and persistent conflicts about dependency." (Weiner et al, 1954, p.271). Marshall (1960) on the other hand, found no evidence for a characteristic dependency conflict in ulcer patients, when compared to non-ulcer psychosomatic and non-psychosomatic groups on the Edwards Personal Preference Schedule.

Another major influence in this area was H.G. Wolff (1953, 1968), who maintained that psychosomatic disorders arise as a part of the individual's inherited mode of defensive physiological response to stress. Concommitant with the somatic response the individual experiences an associated and consistent emotional feeling tone or attitude. Thus, when Wolff referred to "ulcerative types", "colitis types",and "migraine types", he was referring to individuals who react to stress with particular constellations of bodily changes, feelings and attitudes. Unlike Alexander's (1950) utilization of clinical inference and emphasis on unconscious conflict, Wolff's (1953) psychological formulations were based on personality features that were directly observable from clinical interviews, and that pertained to conscious layers of the subject's personality functioning and life experiences. In-depth analyses and inferences were avoided.

Two students of Wolff, Grace and Graham, (1952) formulated a derivative hypothesis which they named "specificity of attitude"

hypothesis. According to this hupothesis there is, associated with each psychosomatic disease, a specific attitude towards the life events that precipitate the first appearance or later exacerbations of the disease. Attitude here refers to "... a clear and unambiguous statement of what he (the patient) felt was happening to him, and what he wanted to do about it, at the time and occurrence of the symptom." (Grace and Graham, 1952, p.244).

Nausea and vomitting, for example, were found to occur "... when an individual was thinking of something which he wished had never happened. He was preoccupied with the mistake he had made rather than with what he should have done instead. Usually he felt responsible for what had happened. Typical statements: 'I was sorry I did it'; 'I wish things were like they were before'. Data concerning attitudes was obtained on the basis of clinical interviews with patients suffering from 12 kinds of symptoms.

The "specificity of attitudes" hypothesis led to a series of research in which attitudes were experimentally induced by hypnosis and concomitant physiological changes recorded. (Graham et al, 1958). The hypothesis is partly verified by the finding that different induced attitudes elicit different physiological reactions; but it is also partly refuted by the fact that the same physiological reaction may be induced by more than one attitude. As Buss (1966, p.418) points out "There simply are not enough discrete physiological reactions to satisfy

the number demanded by the theory. Therefore the theory will probably have to be amended in the direction of less specificity."

At present the association between personality characteristics and specific psychosomatic disorders appears confusing. Patients suffering from such disorders continue to be described in terms compatible with those used by earlier "specificity theorists". Patients suffering from ulcerative colitis, for example, have been described as characteristically passive, conforming and dependent personalities. (Wijsenbeek et al, 1968; McMahon et al, 1973). At the same time there appears to be considerable variation amongst the personality characteristics of individuals suffering from the same disorder as well as overlap between the personality characteristics of those suffering from different disorders. (Engel, 1975; Reiser, 1975).

The confusion has been attributed by Kimball (1975) to a lack of a clear definition of what is meant by personality: This is illustrated by a comparison of the research of Weiner et al (1954) and Marshall (1960), both aimed at investigating the dependency needs of ulcer patients. Weiner Marshall (1960) utilized the Edwards Personal Preference Schedule (EPPS). The projective techniques used by Weiner et al (1954) imply that personality is being viewed in terms of unconscious conflicts and motivations. The EPPS used by Marshall (1960) is a self-report inventory. As such it implies on emphasis on the more conscious aspects of psychological functioning.

Mendelsohn et al (1968) warns against the confusion of predictive and retrospective studies. Again the discrepancies between the findings of Weiner et al (1954) and Marshall (1960) may be explicable in terms of such a confusion. It is very probable that an individual's psychological functioning alters after the onset of psychosomatic disorder. Both predictive and retrospective studies are valuable to the extent that they enable us to understand the individual at different times prior to the onset and during the course of disease. Reiser (1975) points out, however,that researchers should differentiate between the period prior to onset of disease, the period during which symptoms are evident and the period of recovery.

CONCLUSIONS

From the theory and data reviewed we can conclude the following:

1. The nature and location of symptoms in psychosomatic disorders appear to be at least partially due to a somatic daithysis (vulnerability). The basis of this diathysis is thought to lie in patterns of autonomic reactivity. Research suggests that these patterns are inherited, although we still need to establish whether they are stable over a lifetime and whether they alter with the onset of a psychosomatic disorder.

2. Research within the areas of both social psychology and learning theory is furnishing us with a growing body of knowledge concerning the development and maintenance of psychosomatic disorders. Within the field of social psychology it has been demonstrated that the nature of the social structure has an effect on psychophysiological functioning. Research has just begun to explore the differential effects, on psychophysiological functioning, of various environmental dimensions and the way in which these may be related to chronic disorders. This research has important implications when one is planning social environments conducive to healthy human functioning.

Learning theory furnishes us with an understanding of the way in which psychosomatic symptoms may be cued and reinforced with the individual's behavioural repertoire. This research has had valuable therapeutic implications and the treatment of psychosomatic disorders has included the gamut of behaviour modification techniques.

3. The association of specific personality characteristics with specific psychosomatic disorders remains unclear. Research both supports and refutes the notion that patients suffering from particular psychophysiological disorders are characterized by a particular mode of psychological functioning. It is suggested that the confusing picture presented by available research is accountable for by several sources of confusion.

(1) Lack of a clear definition of what is meant by personality reflected in the different kinds of measuring techniques used.

(2) A tendency to compare the results of retrospective and prospective studies.

(3) Inadequate control procedures.

CHAPTER II

MIGRAINE HEADACHE

This chapter begins with an introduction to the concept of migraine. In the second section the organic basis of migraine is dealt with. Aetiological factors are then considered. Studies investigating the personality traits of migraine sufferers are dealt with in more detail and the aims of this study follow out of the critique of the personality studies.

Introduction to Migraine

The Ad Hoc Committee on the Classification of Headache of the National Institute of Neurological Diseases and Blindness (1962) defined migraine as "... recurrent attacks of headache, widely varied in intensity, frequency and duration. The attacks are commonly unilateral in onset, are usually associated with nausea and vomitting, in some are preceded by or associated with sensory, motor and mood disturbances, and are often familial." (Quoted in Bakal, 1975, p.369). A further distinction was made between classical and common migraine, classical migraine being accompanied by sensory and motor prodromal symptoms.

The distinction between classical and common migraine is not generally observed in the literature, and both forms of headache are usually simply referred to as migraine.

Migraine is listed by DSM-II (1968) as a psychophysiological cardio-vascular disorder. Both somatic and psychological factors are held to be contributory to aetiology and both forms of treatment are frequently necessary to alleviate the disorder. It is a fairly common disorder with an estimated incidence of at least 5% of the general population. (Chides and Sweetnam, 1961; Lennox, 1941; and Lyghty, 1966). A survey of 900 students conducted by the University of Cape Town Student Health Service during 1971 yielded similar figures - between 4.9 - 5.8% for the various subgroups. There is an higher preponderance amongst females, who constitute 60 - 80% of reported migraine sufferers. (Dalsgaard-Nielsen, 1970; Selby and Lance, 1960; Kinnier and Wilson, 1940).

Age of onset varies from 18 months to 60 years. Average age of onset is, however, before or during puberty, with girls having their first attack later than boys. (Dalsgaard-Nielsen, 1970; Selby and Lance, 1960). No association has been found between IQ and migraine amongst a group of 1,085 children. (Bille, 1969).

The Organic Basis of Migraine.

Migraine is thought to result from a series of vascular events. In classical migraine prior to the onset of headache, there is a period of intense intracranial and extracranial vasoconstriction. (O'Brien 1971; Ostfeldt & Wolff, 1958; Skinhoj & Paulson, 1969). This may result in sensory and motor prodromata. During the headache phase pain is the result of profound dilation

of the extracranial and cerebral vasculature. (Dalessio, 1972; Tunis and Wolff, 1953.). At the onset of headache pulsatory head pains are experienced. These result from the increased amplitude of hydraulic pulsations of the distended extracranial vasculature, which in turn distends surrounding pain-sensitive fibres. As the headache progresses an inflammation and edema are produced in the extracranial arteries and the pain becomes steady rather than pulsating.

The classic study by Graham & Wolff (1948) was the first to demonstrate the involvement of the extracranial vessels. They administered the vasoconstrictive substance ergotamine tartrate to subjects during the headache phase of a migraine attack and simultaneously recorded extracranial vasomotor activity from the superficial temporal and occipital arteries. By doing so they were able to establish several important psychosomatic relationships. First, subjects showed a decrease in the magnitude of the pulse amplitudes with the decrements ranging from 84% - 16%. Subjects also showed a corresponding decline in the subjective intensity of headache. It was observed that if the amplitude of the pulsations decreased slowly, the pain also decreased slowly. If the pulse amplitude dropped precipitously, the headache ended promptly. A high degree of intrasubject vasomotor specificity was also found in some subjects - in that only the cranial vessels on the painful side showed vasodilation.

Since the pain is produced by the effects of extracranial vasodilation it follows that the administration and substances pro-

ducing constriction of the affected vasculature should alleviate the pain. In fact a wide range of such vasoconstrictors have been shown to alleviate the pain to a greater or lesser degree. The most reliable of these is considered to be ergotamine tartrate and a positive response to this drug is sometimes regarded as a diagnostic sign. (Dalessio, 1972).

The vascular events involved in migraine are thought to be due to exaggerated cranial and extracranial arterial responsiveness and variability. Tunis and Wolff (1953) compared the magnitude at the temporal artery pulse wave of subjects who suffered from migraine with the pulse waves of subjects who were relatively headache free. Even during headache free periods, each measured component of the pulse wave contour of the migraine group was significantly greater than the comparable measurement from the non-headache group. Dalessio (1972b) observed that individuals suffering from frequent and severe migraine often have the temporal artery prominent on both sides of the head even when headache free. These findings have been interpreted as indicating an exaggerated cranial and extracranial arterial responsiveness amongst migraine sufferers.

Tunis and Wolff (1953) also found that migraine sufferers showed considerable variability in pulse amplitude responses during the period 18-24 hours prior to the onset of headache. Maximal pulse variability occurred at the height of the attack. Such cranial vascular variability is thought to reflect a more general

problem with autonomic stabilizing mechanisms. (Selby and Lance, 1960). If this is so, it should be possible to detect physiological changes mediated by the autonomic control systems outside the cranial vasculature. Appenzaller, Davison and Marshall (1963) compared the reflex vasomotor response in the hands of migraine subjects with similar responses in the hands of non-migrainous subjects. They attempted to elicit the reflex response of vasodilation by placing a heating device over the subject's thighs and trunk. Such a procedure usually elicits vasodilation in peripheral areas, as occurred in the case of the control group. However, 8 out of the 10 migraine subjects failed to show the effect. Although these results have been replicated (Appenzaller, 1969) other researchers, using the same methodology, found no difference in reflex responses between migrainous and non-migrainous subjects. (French, Lassers and Desai, 1967). Additional research using vascular as well as other measures is therefore required to determine the generality of autonomic variability exhibited by migrainous individuals.

Biochemical studies suggest that alterations in serotonin metabolism are important in the aetiology of migraine. Serotonin is a potent vasoconstrictor of scalp arteries and it is thought that the depletion of plasma serotonin permits the extracranial vasodilation characteristic of migraine. Curran, Hinterberg and Lance (1965), in a study of plasma serotonin levels of migrainous subjects during migraine attacks as well as headache-

free periods, found that 80% of the subjects' serotorin levels were lower during headache. The fall was found to occur at the onset of the migraine attack and persisted for most of the duration of the headache. This finding was later confirmed by Anthony, Hinterberger and Lance (1967) who estimated total plasma serotonin in migrainous subjects during 21 migraine headaches and found that serotonin levels fell by 60% from pre-headache levels. Serotonin injections also alleviated the headache in some cases. The decrease in serotonin level is, in turn, thought to result from an increase in the level of mono-amine oxidase (MAO). MAO governs the oxidative deamination of many amines including serotonin. Support for this hypothesis comes from research indicating that the administration of MAO inhibitors alleviates migraine. (Kimball, Friedman & Vallejo, 1960; Lance, 1967).

Both MAO and serotonin are released through sympathetic nervous system activity. On the basis of the cited research it has been hypothesised that migraine may be precipitated in response to:

1) the production of variable distributions of MAO and serotonin in response to sympathetic nervous system activity, and

2) the existence of hypersensitive arteries to fluctuations in serotonin level. (Mitchell and Mitchell, 1971).

The Aetiology of Migraine

Physical Factors:

Dietary factors are often implicated in the aetiology of migraine. Selby and Lance (1960) found that certain foods could precipitate an attack amongst 25% of a group of 339 migraine sufferers. Fats, fried foods, chocolates and oranges were most frequently mentioned. Tomatoes, pineapples and onions were occasionally mentioned. Graham (1968) lists chocolate, cheese and other tyramine-containing foods amongst the most frequent dietary precipitants. Gutt and Rees (1973) also found cheese and chocolate to be common precipitants of migraine.

Other implicated aetiological factors include excessive exercise, bright lights, noise, insomnia, barometric changes and temperature changes. (Graham, 1968; Gutt and Rees, 1973; Selby and Lance, 1960). Selby and Lance (1960) also found that amongst 62% of a sample of 196 female migraine sufferers the headaches were associated with menstruation. The nature of the association is unclear, although the authors suggest that hormonal balance, fluid changes and nervous tension may all play a part. Amongst other listed physiological precipitants of migraine are hypoglycaemia, syncope, hypertension, fever, dehydration and allergic reactions. (Graham, 1968).

Situational Variables

Several authors have noted the occurrence of what have been labelled "weekend migraines". These migraines occur following periods of stress - often after examinations or on weekends and vacations. (Kolb, 1963; Sacks, 1970; Rees, 1973). Beyond this observation the stimulus dimensions of the social environment cuing and/or precipitating migraine attacks have not been systematically explored.

Rees (1973) found that of a sample of 100 migraine sufferers approximately half had their first attack during periods of stress. The term "stress" has many different implications, however, and as with other authors (e.g. Friedman, 1954; Selby and Lance, 1960) Rees (1973) does not specify its nature.

It was noted in the previous chapter that research in the area of social environmental measurement suggests that certain environmental dimensions are associated with particular psychosomatic disorders. (Kiritz & Moos, 1974). It would be valuable to establish what, if any, are the dimensions of the social environment associated with migraine and the nature of the association.

Personality Factors Associated with Migraine

Much has been written about the personality characteristics of migraine sufferers. Most of the data is based on clinical observation and within this sphere the picture has emerged of

the characteristically obsessional migraine sufferer. The findings are by no means clear cut, however, and psychometric studies attempting to verify the clinical hypotheses present contradictory results - some verifying and some refuting the clinical studies.

Clinical Observational Studies

The bulk of this research began in the 1930's. Data has been obtained from case histories, psychiatric interviews and psychoanalytic investigations. (Knopf (1934) analyzed the case histories of 30 patients referred to an hospital neurology department. Her findings were that "The patients are, on the whole, of the goody-goody type, very ambitious, reserved, repressed and dignified, sensitive, domineering, resentful and possess very little sense of humour." (Knopf, 1934, p.413). This is a rather vague description and rather self-contradictory. One wonders, for example, how the domineering and reserved characteristics manifest themselves together.

Touraine & Draper (1934) also analyzed the "personal histories" of 50 migraine sufferers and found them to be detailed perfectionists who have difficulty facing new situations. Fromm-Reichmann (1937) treated 8 migraine patients within a psychoanalytic framework. She maintained that migraine resulted from unresolved ambivalence - these patients could not tolerate to be made aware of their hostility towards beloved persons.

Selby and Lance (1960) conducted investigations on 500 patients suffering from migraine and allied vascular headaches. They noted that 23% of their migraine patients displayed definite "obsessional trends" in that they were overconscientious, unduly tidy and houseproud. They also tended to double check their actions. Except to state that data was gathered on the basis of "simple questions", and in some instances "a more thorough psychiatric evaluation" (ibid, p.21) the authors give no information in their article concerning their research strategy. This makes it almost impossible to evaluate.

Wolff (1937, 1948, 1963,) studied the personality characteristics of 46 migraine patients. Twenty-one were males and 25 were females. All were under the age of 50 and "no social, intellectual or economic group prevailed" (Wolff, 1948, p.20). Wolff's (1937, 1963,) major work is regarded as a classic in the migraine literature and as such his observations deserve fairly detailed attention.

He found his subjects to be typically obsessional, tense, driving individuals. They were often very neat in childhood, and obsessively clean. During adolescence they often became pre-occupied with unusually high moral and ethical problems, particularly with regard to sex; they often expected others to live up to this type of attitude and were disappointed when they did not. Wolff found 90% of his subjects to be unusually

ambitious and pre-occupied with achievement and success. They tended to be ultra-conscientious and meticulous, fastidious and attempted to bring order into any situation in which they found themselves. They dressed neatly and conservatively. Many were professionals. They did not delegate authority well. Added responsibility or criticism increased the frequency and intensity of attacks. Other characteristics noted were:

Orderliness: Subjects showed marked obsessive traits in that there was a love of order, lists, titles and card-index systems. Also evident were rituals concerned with washing, dressing and thinking. There was also an inflexibility towards ideas or people with personalities and qualities of character different to their own. Readjustment and compromise were difficult.

Resentments: Two-thirds of the subjects were found to be extremely resentful of others, although they were unable to express this resentment or hostility.

Social Relations: These tended to be superficial, with an emphasis on protocol and etiquette.

Sexual adjustments: 80% of the subjects presented with sexual difficulties. The attainment of orgasm was rare. Women tended to view sexual intercourse as something they were forced to tolerate.

Relations to Parents: 30% were characterized by an excessive dependence on mothers.

Wolff (1934, 1963) reports a further study of 20 patients who gave a careful history of events 24 hours preceding an attack, and in almost every instance the patient recounted a situation to which he was unable to give full expression to rage or resentment. He did not maintain that the personality characteristics noted were specific to migraine sufferers alone. Nor did he postulate a direct causal link between the traits and migraine, but held the characteristic traits of migraine sufferers to be important in that they caused difficulties in the adaptation to circumstances and a liability to react excessively to environmental and interpersonal problems. Such difficulties in turn evoke emotional reactions that can precipitate an attack of migraine in individuals so predisposed.

Little information is given about the research strategy used by Wolff (1937, 1963) except that data was gathered from history-taking interviews and that free association and in-depth analysis were avoided. Again this makes the research strategy difficult to evaluate. It would be useful to know, for example, whether "systematically investigated" implies the use of a standardized, structured interview.

Friedman (1954) studied 100 migraine suffering children referred to an hospital headache clinic. No details are given with regard to the way observations were made, but the author notes a predisposition towards certain personality characteristics in the group in that they tended to be "meticulous, real, rigid in their thinking, inflexibility over-conscientious and

perfectionistic". (Friedman, 1954, p.154). They also found it difficult to express hostile feelings. At the same time Friedman (1954) acknowledges however, that "no one dynamic pattern was present and all types of personalities were seen". (ibid, p.158).

In a discussion of adult migraine sufferers Friedman et al (1954) maintain that the most frequent conflicts are concerned with hostile impulses associated with feelings of guilt. As the authors point out, however, such conflicts are to be found amongst many groups of individuals. They also stress, again, the variability of personality traits amongst migraine sufferers. The authors do not state how information was gathered.

Kolb (1963) maintains that the majority of migraine sufferers seeking help "derive from families who take great pride in attainment. They follow rigid forms of behaviour which deny the expression of direct or verbal aggression. Any feelings of resentment or hostility toward a parent or another respected or loved person tend therefore to be deeply rejected or repressed by those brought up in such families. The consequence is that the arousal of conflict with associated anxiety over inevitably emerging hostilities and the need to maintain family standards as a means of continuing the desired relationships form the interpersonal matrix which trigger the headache." (ibid, p.35). Kolb explains the typical "weekend migraine", i.e. migraine occurring at weekends or when the individual is able to relax, as occurring because the person then has time to become aware of the

conflict. The author gives no indication at all as to the source of data on which these observations are founded.

Paulley & Maskell (1975) report on the clinical observations of 800 migraine patients treated at an hospital clinic over a period of 22 years. They maintain that migraine sufferers are characteristically perfectionistic with high standards, intolerant of idleness in others and frequently have feelings of guilt and compulsion ("I ought", "I should"). Their data does not appear to have been gathered or analyzed in any systematic manner.

Critique of the Clinical Observational Studies.

1. The clinical studies as a whole present a picture of the migraine sufferer as a characteristically obsessional personality with an inability to express hostility directly. Such observations were almost certainly useful within the given therapeutic contexts. As with any clinical observations, however, the lack of control procedures raises the question of generalization to non-clinical groups. The findings of Waters (1971) and Lucas (1977) suggest that only 50% of migraine sufferers receive treatment even from their general practitioners. The percentage of migraine sufferers receiving more intensive investigation and treatment such as those attending migraine clinics or receiving psychotherapy is obviously smaller. This suggests that the proposed characteristics of migraine sufferers

derived clinically are based on a fairly select subgroup of such sufferers, and may not apply to the group as a whole.

2. In most of the articles reporting on the clinical observations descriptions of data gathering techniques are vague - in the case of Kolb (1963) they are non-existent. This makes it difficult to assess these studies.

3. Conclusions reached in the clinical studies are based on the researcher/clinicians subjective observations and interpretations. In no instance do the authors mention standardized interview and/or observation techniques. With the best will in the world the researcher is likely, therefore, to both acknowledge and ignore data in accordance with his own particular bias.

4. The reliance, in clinical studies, on subjectivity implies a lack of a clear definition of what is being observed. This makes the replication of such studies difficult.

5. The clinical studies do not include control groups. Thus we do not know to what extent the personality characteristics of migraine sufferers compare with or differ from those of other groups of individuals. We should be especially interested in whether they compare with or differ from other clinical groups.

6. Statistical procedures, when utilized in the clinical studies, are of a descriptive nature. Selby and Lance,(1960) for example, report that 23% of their migraine subjects were characteristically obsessional personalities. We are then left with the problem of interpreting the significance of this figure

for ourselves. Questions arise such as, "Is the reported 23% a significant proportion of migraine sufferers?" or "Are 23% of other clinical groups also characteristically obsessional?"

7. Clinical observations are the source of invaluable hypotheses both in the treatment of individuals and understanding of clinical subgroups. Thus the cited limitations of the clinical studies in no way mitigates against the value of such studies. They merely point to the dangers of generalizing from these studies without further, objective, verification.

Psychometric Studies

Several psychometric studies have attempted to identify psychological characteristics of migraine sufferers. Ross and McNaughton (1945) provide evidence that migraine sufferers are characteristically obsessional personalities. They administered the Rorschach to a group of 50 migraine sufferers, a non-migraine headache group, a psychoneurotic group and a group with no known symptoms. They found that "A quantitative use of the Rorschach has given independent confirmation that certain personality features are associated with migraine more than can be accounted for by chance, that these personality features include several which have previously been reported by clinical psychiatric and psychoanalytic study, namely persistence towards success, difficulty in sexual adjustment, perfectionism, conventionality, intolerance and general obsessive-compulsive features." (ibid,p.78)

Other studies have utilized tests concerned mainly with the measurement of anxiety and neuroticism. In two instances significant differences were found between migraine and non-migraine groups and in two instances no such differences were found. Maxwell (1966) administered the Maudsley Personality Inventory (MPI) to 32 migraine patients, 32 non-migraine patients who frequently visited their doctor and 32 non-migraine patients who do not visit their doctor frequently. Groups were matched for age and sex. The extraversion scale did not differentiate between groups. Migraine subjects scored significantly higher on the Neuroticism scale than either control group. (p.0.001). It is not clear from the report on this study whether the migraine group were or were not regular visitors to their doctor. This makes the rationale for choice of control groups and the differences between groups difficult to interpret. Henry Gutt and Rees (1973) studied a sample of headache sufferers obtained through a Civil Service Survey using the Eysenck Personality Inventory and MMPI. Twenty-five males and twenty-five females suffering from classical migraine were matched with the following groups:

(a) Common migraine sufferers.

(b) Non-migraine headache group.

(c) Headache-free group.

(d) Patients attending clinic for treatment of classical or common migraine.

(e) Asthma sufferers.

Classical and common migraine sufferers scored significantly higher than headache and no headache controls on the N scale of the EPI, with patients attending the migraine clinic scoring significantly higher than the random sample of classical and common migraine sufferers. The same results were obtained for the anxiety and somatisation scales of the MMPI. The random sample of migraine sufferers obtained significantly lower scores than all groups on the Extraversion scale of the EPI. Waters and O'Connor (1970) used the 9 items of the Cornell medical index to measure psychoneurosis in migraine and non-migraine headache groups. Subjects were selected through a community sample to avoid selection bias with respect to complaint to a doctor. No significant differences were found between migraine and non-migraine subjects.

Phillips (1976) also administered the EPI to 3 groups; a migraine group, a muscular tension headache group, and a mixed migraine and muscular tension headache group. As in the Waters and O'Conner study (1970) there were no group differences on test scores. Taking the group as a whole and comparing their scores to the normative test data of the standardisation sample, no significant differences on E or N were obtained. When the group as a whole was subdivided on the basis of medication (interpreted as a form of complaint behaviour) high medication was associated with higher E and N scores.

Critique of the Psychometric Studies

1. The results of the psychometric studies present a confusing picture, since in three instances differences were found between migraine sufferers and control groups and in two instances they were not. This contradiction may, possibly, result from differences between migraine sufferers who received more intensive treatment and those who do not. This hypothesis is based on the observation that where migraine sufferers receiving more and less intensive treatment are compared, those receiving more intensive treatment are significantly more neurotic and anxious than those receiving less intensive treatment. (Gutt and Rees, 1973; Phillips, 1975). The increased neuroticism amongst the clinic group may be treatment effect or it may be characteristic of those individuals seeking more intensive treatment. In either event these findings suggest that it is a potentially confounding variable, especially if the sample includes hospital/clinic patients.

2. With the exception of the asthma control group used by Henryck-Gutt and Rees (1973), the control groups used in the psychometric studies do not use subjects suffering from other psychosomatic disorders. The need to include such controls is illustrated by the following description. "A high proportion of ulcerative colitis patients are described as manifesting so-called obsessive-compulsive character traits, including neatness, orderliness, punctuality, conscientiousness, indecision,

obstinacy and conformity. Along with these are often noted a guarding of affectivity, over-intellectualization, rigid attitudes towards morality and standards of behaviour. Some are petulant, but by and large well-directed aggressive action and clear-cut expressions of anger are uncommon."

(Engel, 1975, p.676). As can be seen from the above quotation, there is considerable overlap in the proposed characteristics of migraine and ulcerative colitis patients. Clearly, therefore, any attempt to identify the specific characteristics of migraine sufferers must consider to what extent these are or are not associated with other psychosomatic disorders or disorders outside the psychosomatic range.

3. With the exception of the Rorschach, used by Ross and McNaughton (1954) the tests used so far have been limited, in that they have been mainly concerned with measuring anxiety and neuroticism. Many groups of individuals are anxious or neurotic. This alone does not tell us much about that group's specific mode of psychological functioning. Furthermore, anyone suffering from regular migraine is likely to become anxious as a result.

4. Researchers have tended to confuse personality traits with psychopathology. According to Foulds et al (1965) traits are universal, relatively ego-syntonic and of long duration. Symptoms, by contrast, are relatively rare, are distressing and provide evidence for a break in behavioural continuity. According to Mayer Gross et al (1972) "the essential nature of the obsessional or compulsive symptom lies in its appearance as a mental content, an idea, image, affect, impulse or movement with a subjective sense of compulsion overriding an internal resistance." (Mayer - Gross et al, 1972, p.126). The outstanding features of the obsessional personality are ". . . rigidity, inflexibility and lack of adaptability; its conscientiousness and lack of order and discipline." (Mayer-Gross et al, 1972, p.130).

Migraine sufferers have been clinically described as typically obsessional personalities. Researchers attempting to verify these descriptions have however, utilised tests measuring obsessional symptoms. Clearly however, personality tests are more suitable than those of psychopathology when an attempt is being made to assess personality.

Conclusions

1. Migraine is listed by DSM II (1968) as a cardiovascular psycophysiological disorder. Research indicates that the pain results from a series of vascular events. These events

begin with extra and intracranial vasoconstriction. Distension of the vasculature follows, causing distension of the surrounding pain sensitive fibres. As the headache progresses edema and inflammation occur in the extracranial arteries. These vascular events are thought to result from the production of variable distributors of serotonin and MAO in response to parasympathetic nervous system activity. (Mitchell & Mitchell, 1971).

2. Numerous aetiological factors in the physical and physiological environments have been identified, e.g. noise, lights, menstruation. (Graham, 1968; Rees, 1973).

3. The situational variables associated with migraines have not yet been systematically explored. It is suggested that such research would be a valuable contribution to the understanding of migraine. (Bakal, 1975).

4. The association between personality traits and migraine is unclear. There is some evidence from clinical studies to suggest that migraine sufferers are obsessional personalities with an inability to express hostility. Not all subjects, however, were found to fit this description. The clinical studies are, furthermore, limited by their lack of objectivity, and refer mainly to individuals receiving psychotherapy and/or attending hospital clinics.

5. Several attempts have been made to verify the clinical observations objectively utilizing the psychometric method.

The results of the psychometric studies present confusing evidence. It is suggested that this confusion results from: i) inappropriate measuring instruments. Tests have been concerned mainly with measuring anxiety and neuroticism and not the more enduring personality traits, and ii) lack of adequate control procedures. In particular, it is suggested that type treatment received is a variable that ought to be controlled.

CHAPTER III

AIMS OF THIS STUDY

1. To investigate whether certain personality traits, as measured by three psychometric instruments, are significantly associated with a specific psychosomatic disorder, that is, migraine.

2. To use tests covering a broader range of aspects of inter- and intra-personal psychological functioning than those used in previous studies, where the main concern has been to measure anxiety and neuroticism. The tests used are self-report inventories and measure, amongst others, specifically those traits that have often been found to be associated with migraine in other studies.

3. To introduce two control procedures absent from most other studies in this field. These are the inclusion of a psychosomatic control group and control for the nature of treatment received.

Note Before Presentation of Null Hypotheses

Each of the psychological tests used measure, amongst other things, traits that have been regarded as characteristic of migraine sufferers on the basis of clinical observations. One could hypothesise, for example, that migraine sufferers would obtain scores that are significantly higher than the control groups on the obsessoid scale of the Hysteroid-obsessoid Questionnaire, the Achievement Via Conformity and Self Control Scales of the California Psychological Inventory and the Conscientious, Controlled and Tense factors of the Sixteen Personality Factor Test.

In this study, however, the concern is not with a few isolated traits, but with the full range of psychological functioning as defined by the three tests used. For this reason the null hypotheses are not stated in terms of the few isolated traits mentioned, but in more general terms relating to each test as a whole. Significant differences on any single sub-test will, however, be detected.

NULL HYPOTHESES

1. There is no significant difference between migraine sufferers and normal controls in terms of:

   a. obsessoid personality traits as measured by the Hysteroid-Obsessoid Questionnaire.

   b. interpersonal functioning as measured by the California Psychological Inventory.

   c. personality traits as measured by the Sixteen Personality Factor Test (16PF).

2. There is no significant difference between migraine sufferers and psychosomatic controls in terms of:

   a. obsessoid personality traits as measured by the Hysteroid-Obsessoid Questionnaire.

   b. interpersonal functioning as measured by the California Psychological Inventory.

   c. personality traits as measured by the Sixteen Personality Factor Questionnaire.

3. There is no significant difference between normal controls and psychosomatic controls in terms of:

   a. obsessoid personality traits as measured by the Hysteroid-Obsessoid Questionnaire.

b. interpersonal functioning as measured by the California Psychological Inventory.

c. Personality traits as measured by the Sixteen Personality Factor Questionnaire.

PROCEDURE

SUBJECTS

Three groups of 31 subjects each were used: a Migraine Group, Psychosomatic-Control Group and Normal-Control Group. "Normal" in this context refers simply to the absence of known psychosomatic disorder. In order to be included in any group subjects had to be:

1. Female: Single sex (female) groups were chosen on the basis of research indicating that certain sex differences do occur between male and female migraine sufferers. There appears to be an higher preponderance of migraine amongst females, who have been found to constitute between 60-80% of reported migraine sufferers. (Dalsgaard-Nielsen, 1970; Lance and Selby, 1960; Kinnier and Wilson, 1940). Age of onset has also been found to differ, with females usually having their first attack later than males. (Dalsgaard-Nielsen, 1970; Selby and Lance, 1960). Since the implications of these differences are not yet fully understood and since female migraine sufferers are more readily available it was decided to use an all female sample.

2. Between the ages of 18 and 30 years. This age limit was chosen to allow for a group past menarche and pre-menopausal, since it has been shown that the incidence of migraine alters during both menarche and menopause. (Heyck, 1968). For this reason subjects whose menstruation was irregular were also excluded.

3. White.

4. Matriculated.

5. Within Class I - III of the social class scale.

This scale was obtained from the University of Cape Town Child Guidance Clinic. No details were available concerning its construction.

MIGRAINE GROUP

Subjects who reported that they suffered from migraine were asked to fill out a questionnaire regarding their symptoms. The diagnostic features used were those listed by The Ad Hoc Committee on Classification of Headache (1962):

1. Unilateral Headache
2. Anorexia
3. Nausea
4. Vomiting
5. Headache preceded or accompanied by sensory or motor disturbances.

There is no information in the literature as to which and how many symptoms are necessary and/or sufficient to establish a diagnosis. This study, following Philips (1976), assumed a diagnosis of migraine if two or more of the above symptoms were present. The format of questions regarding symptoms was taken from the Migraine Questionnaire of Waters and O'Connor (1970). Information regarding type of medication used, previous diagnosis and familial history of migraine was

regarded as corroborating evidence for the diagnosis. The following were excluded:

1. Subjects suffering only or mainly from pre-menstrual migraine.
2. Subjects whose migraine result from known organic aetiology, e.g. following head injury.
3. Subjects with irregular menstrual cycles. These subjects were excluded on the basis of evidence to suggest that changes in the menstrual cycle may be accompanied by alterations in the incidence of migraine. (Heyck, 1968).
4. Subjects receiving psychiatric treatment or psychotherapy were excluded to control for the treatment variable. For this reason, as well, an hospital sample was avoided.
5. Subjects were excluded if the frequency of migraine attacks was less than two per month. The cut-off point is again arbitrary but necessarily so in the absence of statistical guidelines.

PSYCHOSOMATIC CONTROL GROUP

Subjects who reported having been treated for various psychosomatic disorders were included in this group. A major problem of this research was the selection of patients for inclusion in this group. It proved impractical to establish rigid criteria for each group of disorders and to equate these

with the criteria for migraine. Reported previous medical diagnosis was therefore used as the criterion. Using such a criterion a proportion of mis-diagnoses is possible. At the same time, however, subjects were closely questioned as to whether a medical practitioner had clearly stated the diagnosis. In cases of doubt subjects were excluded. An hospital sample was avoided and subjects receiving psychotherapy or psychiatric treatment were excluded.

The group consisted of the following:

1. 12 asthmatics
2. 10 subjects suffering from neurodermatitis (including eczema and urticaria).
3. 7 subjects suffering from ulcers.
4. 1 subject suffering from ulcerative colitis.
5. 1 subject suffering from spastic colon.

NORMAL CONTROL GROUP

Subjects in this group reported no known psychosomatic disorder. In cases of doubt subjects were excluded. An hospital sample was avoided. Subjects receiving psychotherapy or psychiatric treatment were excluded.

Psychological Tests

Subjects were given a battery of three psychological tests to be completed in their own time.

Rationale For Choice of Tests

Hysteroid-Obsessoid Questionnaire (HOQ)

Migraine sufferers have been described, on the basis of some clinical observations, as often being obsessional (obsessoid) personalities. The advantage of the HOQ is that it measures such personality traits without regard to symptoms or psychopathology.

The California Psychological Inventory (CPI)

The aim of this research is to investigate the interpersonal as well as intrapersonal functioning of migraine sufferers. The CPI is a self-report inventory concerned mainly with measuring interpersonal functioning in that "Its scales are addressed principally to personality characteristics important for social living and social interaction." (Gough, 1960, p.5). A major advantage of the test, as far as the present research is concerned, is that scores on the CPI should enable us to identify the obsessional personalities often held to be associated with migraine. One would expect, for example, that such obsessional individuals would obtain low scores on Tolerance, Achievement via Independence, and Flexibility Advantages of the test are the size and variability of the norm groups, the great amount of empirical research that has been accumulated and its predictive validity. (Anastasi, 1968).

Sixteen Personality Factor Test (16PF)

Cattell et al (1970) maintain that the 16PF is designed as a comprehensive test of fundamental personality traits. It is a test of proven reliability and validity, covering a broad range of personality traits and accompanied by a great deal of empirical information. (Cattell et al, 1970; Pervin, 1970; Bouchard, 1972). Amongst the traits measured are some that have been frequently applied to migraine sufferers, such as sober, conscientious, controlled, conservative and tense.

Hysteroid-Obsessoid Questionnaire:

Description: The HOQ consists of 48 descriptive statements which are marked True and False depending on whether the testee feels they do or do not apply to him.

Construction

This test is based on the notion that personality traits and symptom complexes are distinguishable and should be measured separately. Traits are regarded as being more enduring and pre-dating any neurotic illness. The HOQ is designed to measure those personality traits associated with hysteroid and obsessoid personalities. The terms hysterical and obsessional have been avoided, so as to avoid confusion between the personality traits and obsessional/hysterical symptoms.

The test was constructed on the basis of an earlier obsessoid-hysteroid rating scale (Foulds and Cane, 1968, 1969). The rating scale consisted of the following traits rated on a five point scale:

	HYSTEROID	OBSESSOID
1.	Excessive display of emotions.	Scarcely any display of emotions.
2.	Vivid day dreams	Inability to indulge in fanciful thinking.
3.	Frequent mood changes.	Constant mood.
4.	Given to precipitate action.	Slow and undecided owing to weighing of pros and cons
5.	Overdependent.	Obstinately independent.
6.	Under-conscientious.	Over-conscientious.
7.	Careless and inaccurate.	Stickler for precision.
8.	Shallow emotionally.	Feels things deeply.
9.	Desire to impress and gain attention.	Self-effacing.

This rating scale was found to have several deficiencies.

1. Self ratings on the scale by observer rated hysteroid and obsessoid persons failed to distinguish between the two groups.

2. Untrained subjects found the rating scale principles too difficult to grasp.

3. Some of the items had moral implications as worded.

4. The 9-point scale was too short for high reliability.

To overcome these difficulties the HOQ was constructed.

In the construction of the HOQ several statements were framed which were thought to be pertinent to each of 9 items of the original scale. Two additional traits which were added were concerned with enjoying being the centre of attention (hysteroid) vs preferring to stay in the background (obsessoid) and making superficial friendships vs making deep, lasting friendships, (hysteroid). As far as possible statements having moral implications and those having to do with symptoms were avoided. Forty-eight statements were compiled, each of which could be scored in an obsessoid or hysteroid direction.

Validity

Total HOQ scores were validated against the mean ratings received by two samples of neurotics observed by the professional staff in an hospital setting. Mean scores on the HOQ differentiated significantly between those patients rated as hysteroid or obsessoid. Thus, according to Lorr, (1972), there is sufficient evidence of positive observer vs HOQ self rating relationship.

Reliability

Test - retest on a group of 30 normal subjects after an interval of one year, yielded a coefficient of 0.85, (Caine, 1965 a), inter-rate reliability was established at 0.77. These reliability data can be considered satisfactory.

HOQ and other Clinical Scales

In general the empirical evidence is that the association of the HOQ with symptom tests is minimal. No correlation was found between HOQ and any MMPI scales. HOQ scores were unrelated to General Punitiveness on the Direction of Hostility Scale, but was significantly related to Direction of Punitiveness. This finding is regarded by Foulds et al (1965) as evidence of an association between hysteroid personality traits and estra-punitiveness.

HOQ scores did not correlate significantly with Extra-version as measured on the MMPI. This has been interpreted by Eysenck (1972) and Lorr (1972) as indicating that HOQ simply is another measure of extraversion. Foulds et al (1965) maintain, however, that despite their obvious association, "the concepts of extraversion and of hysteroid obsessoid represent different levels of personality functioning. The former indicates the direction, the latter the how of behaviour."

Age, Sex and Diagnosis

Scores on the HOQ were found to be normally distributed in the original validational samples. No significant association has been found with verbal ability. In the original sample a small significant association was found with age. This was not sustained in later research. (Caine, 1970).

CRITIQUE

Several criticisms have been levelled against HOQ:

1. There is no data available concerning split-half reliability and internal consistency, (Eysenck, 1972, Lorr, 1972). Lorr points out however, that the fact that test-retest correlations after 6 weeks to 1 year ranged between 74 to .85 suggests that internal consistency is adequate.

2. Data in the test manual suggests that HOQ is unable to distinguish psychiatrically diagnosed 'hysterics' and 'obsessionals'. Eysenck (1972) levels this as a criticism of the test. The HOQ is, however, not intended to assess symptomatology but personality traits.

3. Perhaps the most serious criticism to date is the lack of validity research employing normal subjects. Despite the assumption that personality traits and symptoms are not necessarily associated it is obviously desirable that validity research is conducted on normals as well as neurotics.

Despite the need for more validity and reliability data, that data which has been accumulated suggests a reliable and valid instrument for measuring the hysteroid and obsessoid components of personality. A major advantage of the test, especially as pertains to this research, is that its scores are not associated with psychiatric diagnosis.

CALIFORNIA PSYCHOLOGICAL INVENTORY

The CPI is a 480 itemed self report inventory. It is essentially a self-administering test with instructions printed on the front of the special questionnaire booklet. Answers are recorded on a separate answer sheet.

CONSTRUCTION

The goal of the construction of the CPI was to develop a personality test possessing broad personal and social relevance. Whilst many tests are applicable only in specific contexts, e.g. psychiatric clinics, the CPI is applicable to a broader range of subjects. It is concerned not with the morbid or pathological but with the positive aspects of personality. (Gough, 1969).

CPI scales are concerned with personality characteristics important for social living and social interaction. Each scale is intended to cover one important facet of interpersonal psychology and the total scale to provide a comprehensive survey of the individual from a social interaction point of view.

The personality characteristics measured by the CPI are based on "folk-concepts" - variables used for the description and

analysis of personality in everyday life and in social interaction (Gough, 1965, Lewis, 1972 p 94). That is, Gough equates the relative importance of a trait with its probability of occurrence in all natural languages.

The CPI consists of 480 items presented in a true/false format. Twelve items are duplicates, 178 are taken from the MMPI and 35 are revised MMPI items. Scale names were chosen to describe as closely as possible the kind of behaviour they are intended to reflect. The scales have been grouped into 4 broad categories, bringing together scales having similar implications. The grouping has been done on an intuitive rather than statistical basis.

The scales are arranged as follows:

CLASS 1: Measure of Poise, Ascendancy, Self Assurance and Interpersonal Adequacy.

1. Do Dominance
2. Cs Capacity for Status
3. Sy Sociability
4. Sp Social Presence
5. Sa Self Acceptance
6. Wb Sense of Well-being

CLASS 2: Measures of Socialization, Maturity, Responsibility and Interpersonal Structuring of Values.

7. Re Responsbility
8. So Socialization
9. Sc Self Control
10. To Tolerance
11. Gi Good Impression
12. Cm Communality

CLASS 3: Measures of Achievement, Potential and Intellectual Efficiency.

13. Ac Achievement via Conformance
14. Ai Achievement via Independence
15. Ie Intellectual Efficiency

CLASS 4: Measures of Intellectual and Interest Modes.

16. Py Psychological Mindedness
17. Fx Flexibility
18. Fe Femininity

Eleven of the CPI scales were developed by the technique of criterion keying. (Do, Cs, Sx, Re, So, To, Ac, Ai, Te, Py, and Fe). In those instances where it proved unfeasible to obtain sufficiently large samples of criterion subjects for such empirical item analyses, scales were constructed by the technique of internal consistency. (Sp, Sa, Sc, and Fx).

Three scales are regarded as validity scales. These are the Sense of Well-being scale (Wb), based on responses by normal subjects to "fake bad; good impression scale based on responses by normals asked to "fake good", and communality (Cm) and based on frequency count of highly popular responses. Scores outside the usual limits are indicative of invalidity in the test record.

RELIABILITY OF THE CPI

Two test-retest reliability studies are described in the manual. In one study two high school classes took the CPI twice,

at yearly intervals. In the other, 200 male prisoners took the test twice, the interval between test taking ranging from 1 - 3 weeks. In this study, questions were read aloud to half the subjects on the first administration and they read the questions silently to themselves the second time; the procedure was reversed for the rest of the subjects. No differences were observed with the second administration. Retest reliabilities over a year's interval in the high school groups yielded a median coefficient of .65 for males and.68 for females; with the adult group the median coefficient was .80. Walsh (1972) evaluates this reliability data as being "moderate". Gough (1969) does, however, attempt to account for the more modest coefficients amongst high school students by suggesting that these may reflect, in part, the differing rates of maturation among these adolescents during the year between testings. Gough (1969) concludes that "In general, the consistency or measurement is high enough to permit use of the scales in both group and individual testing."

No split-half reliability data are available.

VALIDITY OF THE CPI

The manual describes numerous cross-validation studies of all scales. Only a few will be cited here as examples:

(1) In an assessment study of 70 medical school applicants at University of California the Do scale correlated + .48 with staff ratings of "dominance".

(11) In a sample of 100 military officers, Ie correlated + .58 with scores on the Terman Concept Mastery test of intelligence.

(111) In a sample of 152 adult males, Ie correlated -.41 with the masculinity scale of the Strong Vocational Interest Blank. In this same sample, Fe correlated + .43 with the Mf (feminine interests) scale of the MMPI.

The foregoing are quoted to illustrate the way in which the scales have been validated. Reviewing the 50 cross validation studies reported in the manual Anastasi (1968 p 448) concludes that "Cross validation of all scales on sizeable has yielded significant group differences, although the overlapping of contrasted criterion groups is great and criterion correlations often low.

One of the main advantages of the CPI is its predictive validity. Research has provided a number of regression equations for the optimal weighting of scales to predict such criteria as delinquency (Gough, 1966a), parole outcome (Gough, et al 1965), high school and college grades (Gough, 1964 a, b & c). Cross cultural studies with individual scales have also yielded validity data against local criteria within different cultures, (Gough, 1965a, 1966 a & b, 1973).

FACTOR ANALYTIC STUDIES OF THE CPI

Factor analyses of the CPI have varied in the number and interpretation of factors obtained, partly as a function of the population employed and partly as a function of the statistical methods used (Burger, 1975). Stroup & Manderscheid (1975) administered the CPI to a population of Mid-Western students. (N-1, 939). Scores were factor analyzed and the results were compared with the factor structures reported in two earlier studies

(Mitchell & Pierce-Jones, 1960, Pierce-Jones, Mitchell & King, 1962). Factors 1 (conformity-neurotic anxiety) and 11 (extraversion) are invariant in all three analyses. Factors 111 (capacity for achievement) and IV (Super ego strength) differ across populations. These authors attribute the differences to population differences in the case of Factor 111 but to over-factoring in the case of Factor IV.

Lovegrove & Hammond (1974) present a factorial solution of the items of the CPI for a sample of 14 year old Australian males. Six main factors were named - Personal Adequacy and Well-being, Serious Flippant Life Attitudes, Sociability and Interpersonal Competence, Community Alienation, Rigidity of Thought and Authoritarianism.

The studies cited above are just two of many such studies, aimed at eliciting the factorial structures of the CPI. Walsh (1972) lists 12 such studies most of which extract 4 factors. According to Megaigee (1972), however, whilst most studies extract several factors, only the first two appear stable and account for the major portion of the variance. Nicholls & Schell (1963) have labelled these: Person Orientation and Value Orientation). Mitchell & Pierce-Jones (1960) have labelled them: Extraversion and Adjustment via Conformity.

The fact that 18 scales can be reduced to a few factors raises the issue of scale redundancy and the psychological meaningfulness of the scales.

Scoring and Norms

Norms for the CPI were developed from the consolidation of available samples into a single composite sample for each sex. Standard scores for males are based on approximately 7,000 cases and female norms are based on approximately 6,000 cases. A wide range of ages, socio-economic groups and geographical areas are included. (Gough, 1968).

Scoring is done by placing transparent scoring templates over the answer sheet. Raw scores are converted into standard scores by reference to the appropriate sex norm table. The mean standard score for each scale is 50, with a standard deviation of 10.

CRITIQUE

Several criticisms have been levelled against the CPI. Goldberg (1972) questions the validity of "Folk concepts". He maintains that, if these do pertain to all natural languages, a logical starting point for the construction of the CPI would have been cross-cultural linguistic studies.

Originally the CPI was intended as an "open instrument" for which new scales could be constructed as the need arose. Goldberg (1972) advances as a criticism the fact that this has not been done to any significant degree. Gough has, however, developed a series of regression equations, based on the original 18 CPI scales, to predict such criteria as leadership, social maturity as delinquency parole outcome, effectiveness in teaching and others. Gough has, in other words, utilized combinations of existing scales for prediction purposes. There is no reason to assume that this method is less effective than the constructing of new scales.

Walsh (1972) criticises the construction of CPI scales on the basis of criterion keying, maintaining that such an approach results in scales that have no basic psychological meaning. Goldberg (1972) points out that if the 18 scales can be reduced to an average of four factors, many scales are redundant. Anastasi (1965) & Goldberg (1972) also point out that the high interrelations of scales suggest scale redundancy may be a "pseudo-hability".

Walsh (1972) & Goldberg (1972) also question response validity. Walsh points out that approximately ¼ of the CPI

scales correlate highly with those MMPI scales saturated with social desirability. Goldberg suggests that the CPI should include more duplicated items and the response consistency to these should be scored as a gross measure of response consistency. There is no evidence, however, that such an approach would be more useful than utilizing the existing validity checks. More research would clarify this.

Goldberg (1972) also criticises the intuitive mode of profile interpretation advocated by Gough (1969). He suggests the need for more research into profile interpretation.

The CPI could certainly benefit from more research into such areas as construct and predictive validity, and response reliability. Even as it stands, however, it has several advantages. One of these is the large size and variability of the norm group (more than 6,000 men and 7,000 women). A great deal of empirical research has accumulated to enable predictions of such criteria as delinquency, parole outcome and others (Anastasi 1968). The tests predictive validity has, in fact, been established in several areas in industrial, clinical and educational settings. It is a useful test when one is interested in the interpersonal as opposed to interpsychic structure. Finally, despite its limitations the CPI is described by Anastasi (1968) as being of the highest technical order whilst Kelley (1965) regards it as one of the best psychometric instruments of its kind.

Sixteen Personality Factor Test

Test Description

The 16PF is described by Cattell as a comprehensive test of fundamental personality traits (Cattell, 1970). It was designed for use with subjects aged 16 and above. Four forms A,B,C and D are available for use with literate adults. Two forms - E and F - are adults with educational and/or reading deficits. Each form is comprised of 16 subscales, each purported to measure a different "source trait" or functionally independent dimension of personality. The test can also be used as a measure of 8 secondary dimensions, which are broader traits scorable from the component primary scales (factors). Each primary scale consists of 10-13 items. Three alternative answers are provided for each item. The two-answer "forced choice" situation was avoided since it tends to produce a distorted response distribution and may result in an aversion to the test on the part of the testee.

THE PRIMARY SOURCE TRAITS COVERED BY THE 16PF TEST

Factor	Low Sten Score Description (1-3)	High Sten Score Description (8-10)
A	Reserved, detached, critical, aloof, stiff Sizothymia	Outgoing, warmhearted, easy-going, participating Affectothymia
B	Dull Low intelligence	Bright High intelligence
C	Affected by feelings, emotionally less stable, easily upset, changeable Lower ego strength	Emotionally stable, mature, faces reality, calm Higher ego strength
E	Humble, mild, easily led, docile, accommodating Submissiveness	Assertive, aggressive, competitive stubborn Dominance
F	Sober, taciturn, serious Desurgency	Happy-go-lucky, enthusiastic Surgency
G	Expedient, disregards rules Weaker superego strength	Conscientious, persistent, moralistic, staid Stronger superego strength
H	Shy, timid, threat-sensitive Threctia	Venturesome, uninhibited, socially bold Parmia
I	Tough-minded, self-reliant, realistic Harria	Tender-minded, sensitive, clinging, overprotected Premsia
L	Trusting, accepting conditions Alaxia	Suspicious, hard to fool Protension
M	Practical, "down-to-earth" concerns Praxernia	Imaginative, bohemian, absent-minded Autia
N	Forthright, unpretentious, genuine but socially clumsy Artlessness	Astute, polished, socially aware Shrewdness

(continued

THE PRIMARY SOURCE TRAITS COVERED BY THE 16PF TEST Continued)

Factor	Low Sten Score Description (1-3)	High Sten Score Description (8-10)
O	Self-assured, placid, secure, complacent, serene Untroubled adequacy	Apprehensive, self-reproaching, insecure, worrying, troubled Guilt proneness
Q_1	Conservative, respecting traditional ideas Conservativism of temperament	Experimenting, liberal, free-thinking Radicalism
Q_2	Group dependent, a "joiner" and sound follower Group adherence	Self-sufficient, resourceful, prefers own decisions Self-sufficiency
Q_3	Undisciplined self-conflict, lax, follows own urges, careless of social rules Low self-sentiment	Controlled, exacting will power, socially precise, compulsive, following self-image High strength of self-sentiment
Q_4	Relaxed, tranquil, torpid, unfrustrated, composed Low ergic tension	Tense, frustrated, driven, overwrought High ergic tension

Construction

The 16PF is held as an exemplar of Cattell's research programme which has as its aim "....the identification of the basic dimensions of personality and the development of a set of instruments to measure these dimensions across different data domains". (Rover, 1972 p.332). Cattell has employed the technique of factor analysis to achieve this aim. The development of the 16PF followed a survey of all well-known questionnaire, opinion, interest and value scales. The evidence from this survey and from earlier factor analytic studies suggested the existence of 20 factors, these forming the basis for the development of further questionnaire items (Cattell, 1957). Of these 20 factors, a number were found to be ambiguous and after further refinement the test consisted of 15 personality factors and 1 intelligence factor. In addition, Cattell provides evidence for the existence of 8 second order factors.

Reliability

Test re-test reliability data are available for Forms A and B with intervals ranging from 2 days to 48 months. Reliability is generally adequate even after the 48-month period. Certain scales do, however, yield relatively lower reliabilities - these are (intelligence), MC (practical), NC (forthrightness) and Q3 (shrewdness). These reliabilities range from 45 to Other reliability co-efficients are much higher - especially for

Y, H and Q4 scales. Cattell et al (1970) maintains that reliabilities are highly affected by conditions of administration. A second reliability study, utilizing "more mature", i.e. older subjects, yielded more stable and higher reliability co-efficients all around.

Validity. Factor analytic studies provide evidence for the construct validity of the test and sub-scale items. The items in the final test forms are the survivors of thousands of items originally employed, and constitute only those that have significant validity against the factors after 10 successive factor analyses on different samples (Cattell, 1973). Construct validity was also determined by correllating each scale score with the pure factor it was designed to measure. These correllations are generally high for all forms of the test. Furthermore, substantial increases in validity are obtained when more than one form of the test is used.

The 16PF has also been validated empirically against several criteria (e.g. school achievement) and a number of multiple regression equations are available for identifying various occupational and diagnostic groups (Pervin, 1970; Cattell et al, 1970; Bouchard, 1972).

ADMINISTRATION, SCORING AND NORMS.

ADMINISTRATION. The test may be taken individually or in groups. It is essentially self-administering with detailed instructions printed on the re-usable test booklet.

NORMS. Norms are given based on standardisation of the test on 3 populations.

1. High School juniors and seniors.
2. College students, centred on age 20.
3. General adult population, centred on age 30.

Norms for each form are given separately for each sex, as well as for the sexes combined. Norms are also provided for combinations of forms. The sizes of the samples vary from 468 to 4272. The norm tables enable raw scores to be converted into sten scores. These are distributed over 10 equal interval standard score points (assuming normal distribution) from 1 through 0, with the population average fixed at stems 5.5. Stems 5 and 6 extend, respectively a half standard deviation below and above the mean, while the outer limits for stems 1 and 10 are 2% SD above and below the mean.

Raw scores, tabulated using plastic scoring stencils placed over answer sheets, are convertible into sten scores by referring to the appropriate norm tables.

Critique.

(1) Cattell maintains that factor analysis can be relied upon to discover the basic dimensions underlying personality structures. Holt, (1962) points out however, that if researchers start with different principles and use different variables the observed factors differ i.e. you get out what you put in. Thus, whilst factor analysis is useful for reducing large amounts of data to a few categories, one cannot assume that these categories reflect underlying structures. The first 12 factors for example, are purported to represent functional measurement in the sense that they represent natural personality concepts found in the worlds of both factor analysis and ratings. Yet research does not bear this out - Becker (1960) found no discriminant or convergent validity between the 16PF factors and ratings.

(2) Correlations between various forms are not sufficiently high that they may be used interchangeably, (Bouchard, 1972). One cannot assume therefore, that data gathered through the use of one form will be the same as that gathered when another form is used.

(3) Validity checks for response, bias and motivational distortion are provided for form C only. There are thus, in the other forms, no control for these except that an attempt has been made to word items as neutrally as possible.

(4) Despite these criticisms the 16PF remains a useful test. Whilst the factor analytic method does have its limitations, other tests, such as the MMPI and CPQ have been criticised precisely as they failed to address themselves to their factorial structure. The tester can overcome the present lack of certainty regarding form equivalence by evaluating the test he is using only in terms of data specific to that form.

At the same time it is useful as a test of proven reliability and validity, covering a broad range of personality functioning and accompanied by a great deal of empirical confirmation.

STATISTICAL ANALYSIS

Data from the HOQ was analyzed using Analysis of Variance (ANOVA). Data obtained on the CPI and 16PF was first analyzed using the Multivariate Analysis of Variance (MANOVA). MANOVA is an extension of ANOVA which is used when one is comparing groups on more than one dependent variable. It allows for possible dependence amongst measures as would not happen if several separate ANOVAs were calculated. It assumes variables to be normally distributed and is based on an U- statistic with 3 degrees of freedom which is transformed into an F- statistic with 2 degrees of freedom. This is then compared with the F-tables. MANOVA was used to establish each test taken as a whole, that is on all factors of the test simultaneously. Calculations were done on an UNIVAC package BMD 12V.

Following MANOVA ANOVAs were calculated for each score separately. This was done to establish whether the three groups differed significantly on any score independently of the others' scores on that test. Where such differences were found Multiple Comparisons were calculated to establish where the difference lay. In two instances Tukey T- Pairwise Comparisons located the difference. In the third instance the difference was located using Scheffe Multiple Comparisons.

CHAPTER IV

Results

Analysis of Hysteroid-Obsessoid Questionnaire Scores:

TABLE 1 MEAN HOQ SCORES

	Migraine Group	Psychosomatic Group	Control Group
MEAN	20,16	19,80	22,19

TABLE 2 ANOVA TABLE FOR HOQ SCORES

Source	d.f.	Sums of Squares	Mean Squares	F-ratio
Between Groups	2	97,82	48,91	1,81
Within Groups	84	2271,03	27,04	

Since $1,81\ 3,07 = F^{(0,05)}_{2,84}$ we must accept that the vector of mean scores on the HOQ for the 3 groups do not differ significantly at the 5% level.

Null hypotheses 1a, 2a and 3a are therefore accepted:

1a. There is no significant difference between migraine sufferers and normal controls in terms of obsessoid personality traits as measured by the Hysteroid-Obsessoid Questionnaire.

2a. There is no significant difference between migraine sufferers and psychosomatic controls in terms of obsessoid personality traits as measured by the Hysteroid-Obsessoid Questionnaire.

3a. There is no significant difference between normal controls and psychosomatic controls in terms of obsessoid personality traits as measured by the Hysteroid-Obsessoid Questionnaire.

Analysis of C.P.I. Scores.

MANOVA of C.P.I. Scores:

TABLE 3 MEAN C.P.I. SCORES

TRAIT	MIGRAINE GROUP	PSYCHOSOMATIC GROUP	NORMAL GROUP	OVERALL MEAN
1	48,68	46,03	44,81	46,51
2	44,97	39,13	41,06	41,72
3	43,00	43,87	45,42	44,10
4	48,65	46,68	49,10	48,14
5	53,90	50,87	49,48	51,42
6	29,81	36,77	37,55	34,71
7	36,32	35,10	33,90	35,11
8	37,29	36,68	42,39	38,78
9	39,39	43,00	43,55	41,98
10	39,39	41,48	43,05	41,30
11	38,48	42,43	43,42	41,38
12	38,42	39,42	37,61	38,48
13	39,23	39,61	38,29	39,04
14	45,87	50,03	47,65	47,85
15	29,97	29,54	27,48	29,00
16	48,55	48,77	47,06	48,13
17	54,84	57,94	54,16	55,65
18	50,19	50,55	43,10	49,28

$U = 0,386$ is distributed as $U_{18,2,60}$ (degrees of freedom).

F (Approximate) = 1,457 is distributed as $F_{36,86}$.

$F^{(0,05)}_{36,86,} = 1,50$

Since $1,457 < 1,50$ we must accept that the vector of mean scores on the C.P.I. for the 3 groups do not differ significantly at the 5% level.

Null hypotheses 1b, 2b and 3b are therefore accepted.

1b. There is no significant difference between migraine sufferers and normal controls in terms of interpersonal functioning as measured by the California Psychological Inventory.

2b. There is no significant difference between migraine sufferers and psychosomatic controls in terms of interpersonal functioning as measured by the California Psychological Inventory.

3b. There is no significant difference between normal controls and psychosomatic controls in terms of interpersonal functioning as measured by the California Psychological Inventory.

TABLE 4 ANOVA TABLE FOR C.P.I. SCORES

Trait	Source	df	Sum of Squares	Mean Square	F-ratio	$F^{(0,05)}_{2,90}$	NS or S
1	Between groups	2	242,67	121,33	1,15	3,07	NS
	Within groups	90	9482,58	105,36			
2	Between groups	2	548,41	274,20	1,71	3,07	NS
	Within groups	90	14426,32	160,29			
3	Between groups	2	93,10	46,55	0,48	3,07	NS
	Within groups	90	8735,63	97,06			
4	Between groups	2	102,60	51,30	0,33	3,07	NS
	Within groups	90	13780,58	153,12			
5	Between groups	2	316,71	158,35	1,57	3,07	NS
	Within groups	90	9101,93	101,13			
6	Between groups	2	1127,23	563,61	2,60	3,07	NS
	Within groups	90	19517,93	216,87			
7	Between groups	2	90,73	45,37	0,62	3,07	NS
	Within groups	90	6594,19	73,27			
8	Between groups	2	609,18	304,59	2,81	3,07	NS
	Within groups	90	9748,52	108,32			
9	Between groups	2	316,93	158,46	1,90	3,07	NS
	Within groups	90	7513,03	83,48			

(continued

TABLE 4 ANOVA TABLE FOR C.P.I. SCORES Continued)

Trait	Source	df	Sum of Squares	Mean Square	F-ratio	$F^{(0,05)}_{2,90}$	NS or S
10	Between groups	2	207,51	103,75	0,92	3,07	NS
	Within groups	90	10110,06	112,33			
11	Between groups	2	411,12	205,56	2,75	3,07	NS
	Within groups	90	6726,71	74,74			
12	Between groups	2	50,77	25,39	0,10	3,07	NS
	Within groups	90	21952,45	243,92			
13	Between groups	2	28,67	14,33	0,14	3,07	NS
	Within groups	90	9165,16	101,84			
14	Between groups	2	270,34	135,17	1,26	3,07	NS
	Within groups	90	9631,55	107,02			
15	Between groups	2	109,61	54,81	0,46	3,07	NS
	Within groups	90	10758,39	119,54			
16	Between groups	2	53,48	26,74	0,17	3,07	NS
	Within groups	90	13772,97	153,03			
17	Between groups	2	251,02	125,52	0,89	3,07	NS
	Within groups	90	12670,26	140,78			
18	Between groups	2	223,51	111,75	1,26	3,07	NS
	Within groups	90	8007,23	88,97			

$F^{(0,05)}_{2,90}$ (Critical F-ratio) = 3,07
at .05 probability level

Since in each case the calculated F 3,07 we must accept that for each trait the mean scores for each group do not differ significantly from each other at the 5% level.

Again we must accept null hypotheses 1b, 2b and 3b.

1b. There is no significant difference between migraine sufferers and normal controls in terms of interpersonal functioning as measured by the California Psychological Inventory.

2b. There is no significant difference between migraine sufferers and psychosomatic controls in terms of interpersonal functioning as measured by the California Psychological Inventory.

3b. There is no significant difference between normal controls and psychosomatic controls in terms of interpersonal functioning as measured by the California Psychological Inventory.

Analysis of Scores obtained on the 16PF.

MANOVA OF 16PF SCORES:

TABLE 5 MEAN 16PF SCORES

FACTOR	MIGRAINE GROUP	PSYCHOSOMATIC GROUP	NORMAL CONTROL GROUP	OVERALL MEAN
A	4,84	4,19	5,13	4,72
B	6,03	6,00	6,19	6,08
C	4,10	4,68	5,45	4,76
E	5,97	6,10	6,23	6,10
F	4,23	5,13	5,84	5,06
G	4,77	4,55	4,58	4,63
H	5,32	5,19	4,77	5,10
I	5,94	5,29	5,19	5,47
L	6,52	6,42	6,32	6,42
M	6,23	5,90	6,06	6,06
N	5,61	5,87	5,42	5,63
O	6,06	6,52	5,71	6,10
Q_1	8,16	6,97	6,55	7,22
Q_2	6,68	6,90	6,29	6,62
Q_3	5,10	4,58	4,77	4,82
Q_4	5,97	6,03	4,84	5,61

$U = 0,504$ is distributed as $U_{16;2,60}$.

Approximate $F = 1,149$ is distributed as $F_{32,90}$.

$F^{(0,05)}_{32,90} = 1,74$

Since $1,149 < 1,74$

we must accept that the vector of mean scores on the 16PF for the three groups do not differ significantly at the 5% level.

Null hypotheses 1c, 2c and 3c are therefore accepted:

1c. There is no significant difference between migraine sufferers and normal controls in terms of personality traits as measured by the Sixteen Personality Factor Test.

2c. There is no significant difference between migraine sufferers and psychosomatic controls in terms of personality traits as measured by the Sixteen Personality Factor Questionnaire.

3c. There is no significant difference between normal controls and psychosomatic controls in terms of personality traits as measured by the Sixteen Personality Factor Questionnaire.

TABLE 6 ANOVA FOR 16PF

Factor	Source	df	Sum of Squares	Mean Squares	F-ratio	$F^{(0,05)}_{2,90}$	NS or S
A	Between groups	2	14,22	7,11	1,95	3,07	NS
	Within groups	90	328,52	3,65			
B	Between groups	2	0,67	0,33	0,12	3,07	NS
	Within groups	90	257,81	2,86			
C	Between groups	2	28,65	14,32	3,63	3,07	S
	Within groups	90	355,16	3,95			
E	Between groups	2	1,03	0,52	0,14	3,07	NS
	Within groups	90	333,10	3,70			
F	Between groups	2	40,52	20,26	4,21	3,07	S
	Within groups	90	433,10	4,81			
G	Between groups	2	0,92	0,48	0,10	3,07	NS
	Within groups	90	406,65	4,52			
H	Between groups	2	5,10	2,55	0,65	3,07	NS
	Within groups	90	353,03	3,92			
I	Between groups	2	10,09	5,04	0,98	3,07	NS
	Within groups	90	465,10	5,17			
L	Between groups	2	0,58	0,28	0,06	3,07	NS
	Within groups	90	450,00	5,00			

(continued

TABLE 6. ANOVA FOR 16PF Continued)

Factor	Source	df	Sum of Squares	Mean Squares	F-ratio	$F^{(0,05)}_{2,90}$	NS or S
M	Between groups	2	1,61	0,81	0,20	3,07	NS
	Within groups	90	358,00	3,98			
N	Between groups	2	3,18	1,59	0,56	3,07	NS
	Within groups	90	256,39	2,85			
O	Between groups	2	10,13	5,06	1,17	3,07	NS
	Within groups	90	388,00	4,31			
Q_1	Between groups	2	43,42	21,71	0,64	3,07	NS
	Within groups	90	3050,84	33,90			
Q_2	Between groups	2	5,96	2,98	0,87	3,07	NS
	Within groups	90	307,87	3,42			
Q_3	Between groups	2	4,21	2,11	0,44	3,07	NS
	Within groups	90	429,68	4,77			
Q_4	Between groups	2	27,94	13,97	3,51	3,07	S
	Within groups	90	358,13	3,98			

$F^{(0,05)}_{2,90}$ (Critical F-ratio at p = 0,05 with degrees of freedom: 2,90)

= 3,07

For Factors A,B,E,G,H,I,L,M,N,O,Q_1,Q_2 and Q_3 the calculated F-ratio $<$ 3,07. Therefore we must accept that for these factors the mean scores for each group do not differ from each other significantly at the 5% level.

For Factor C, F = 3,63 $>$ 3,07. Therefore we must accept that for this factor the mean scores for each group differ significantly from each other at the 5% level.

For Factor F, F = 4,21 $>$ 3,07. Therefore we must accept that for this factor the mean scores for each group differ from each other significantly at the 5% level.

For Factor Q_4, F = 3,98 $>$ 3,07. Therefore we must accept that for this factor the mean scores for each group differ from each other significantly at the 5% level.

Tukey T - Pairwise Comparisons

TABLE 7a - Tukey T - Factor C

	Migraine + Psychosomatic Groups	Migraine + Normal Groups	Psychosomatic + Normal Groups
t	- 1,62	- 3,78*	- 1,32
$q^{(0,05)}_{3,90}$	3,36	3,36	3,36

$q^{(0,05)}_{3,90}$ = Critical Studentized Range Statistic with 3,90 degrees of freedom at 5% level = 3,36.

*Since 3,787>3,36 we must accept that the mean scores on factor C of the migraine + normal control groups differ from each other significantly at p = 0,05.

TABLE 7b - Tukey T - Factor F

	Migraine + Psychosomatic Groups	Migraine + Normal Groups	Psychosomatic + Normal Groups
t	- 2,28	- 4,09*	- 1,80
$q^{(0,05)}_{3,90}$	3,36	3,36	3,36

*Since 4,097>3,36 we must accept that the mean scores on factor F of the migraine + normal control groups differ significantly at the 5% level.

TABLE 7c - Tukey T - Factor Q_4

	Migraine + Psychosomatic Groups	Migraine + Normal Groups	Psychosomatic + Normal Groups
t	- 0,17*	3,15	3,32
$q^{(0,05)}_{3,90}$	3,36	3,36	3,36

Since none of the calculated t values > q we cannot establish which groups differ significantly on Factor Q_4.

*t = 0,17 indicates that the means of these two groups are very

similar and can be combined. Therefore combine

for Scheffé Multiple Comparisons. When the migraine and psychosomatic groups are combined and compared with the normal control group: S = 3,49.

$S^{(0,05)}_{2,90}$ = Critical S value at 5% level with 2,90 df = 3,07.

Since 3,49 > 3,07 we must accept that for factor Q_4 the mean scores for the migraine and psychosomatic group combined differ significantly from the mean score of the normal control group at the 5% level.

Interpretation of Results

No significant differences were found between the migraine and psychosomatic-control groups in terms of test scores. The Migraine group differed significantly from the normal-control group only on two factors of the 16PF - C and F. In both instances the migraine group obtained scores significantly lower than the normal controls at the .05 probability level.

Factor C is regarded as a measure of ego-strength or "dynamic intergration and maturity as opposed to uncontrolled disorganized general emotionality." (Catrell et al., 1970, p.83). The low scorer on C shows generalized neurotic responses in the form of phobias, psychosomatic disturbances, sleep disturbances, hysterical and obsessional behaviour, and, as Catrell et al point out, "Clinically the outstanding observation is that MOST disorders show low ego strength scores." (ibid.p.84). The difference obtained is thus in the expected direction, with the migraine group displaying less ego-strength or emotional maturity than the normal-control group. It should be noted, however, that the mean score obtained by the migraine group is only .9 less than the norm mean. Since, according to the manual, a score of 1 below the norm mean is to be regarded as only "slightly deviant," the migraine group should be considered as being pathologically low on ego strength.

Factor F is a measure of surgency (high F) or desurgency (low F). The surgent individual is described as "enthusiastic, heedless and happy-go-lucky", whilst the desurgent individual is "sober, taciturn and serious". (Cattell et al., 1970, p.87.) According to Cattell et al (1970) desurgency is associated in a mild degree with practically all mental illnesses and probably with most physical ones as well. The results are, therefore, again in the expected direction, with migraine sufferers appearing more serious and sombre than normal-controls. Again it must be noted that the migraine group deviate only slightly from the norm group and cannot, therefore, be regarded as pathologically low on surgency. No significant differences were found between normal and psychosomatic control groups in terms of test scores.

The migraine + psychosomatic groups combined obtained scores significantly higher than the normal control group on Factor Q_4. This factor measures "ergic tension". A high score indicates an individual who is tense, frustrated, overwrought and fretful. A low score indicates an individual who is relaxed, tranquil, unfrustrated and composed. Clinically Q_4 is one of the three highest loaded factors in general anxiety. "High Q_4 is best interpreted as an "id" . . . energy excited in excess of the ego strength capacity to discharge it, and which is therefore misdirected, converted into psychosomatic disturbances, anxiety, etc., and is generally disruptive of steady application and emotional balance." (Cattell et al, 1970, p.109). The results are therefore in the expected

direction, with the normal-control group better able than the migraine + psychosomatic control group to cope with anxiety in a reality based way.

The significant differences obtained were thus all in an expected direction. It must be noted, however, that even where a significant difference between the groups does exist, none of the group means deviate by more than one point from the mean of the norm population. In terms of the criteria laid down in the manual, this indicates that the means deviate only slightly from the norm means, and that no group's score on any of the factors should therefore be considered pathological.

Furthermore, the fact that the groups differed significantly on only 3 out of 35 scores suggests, that despite the differences found, the groups do not differ in <u>overall</u> psychological functioning. This interpretation is supported by the fact that the differences were only detected when separate ANOVAs were calculated for each score separately. The MANOVA statistic, designed to detect overall differences in test profile and therefore personality functioning, did not detect such differences.

In view of the points made above, the results will be taken to indicate that despite differing from normal controls on two isolated traits, migraine sufferers do not differ from normal or psychosomatic controls in terms of overall personality functioning. More to the point, migraine sufferers were found to be no more obsessional than either control group.

CHAPTER V

DISCUSSION OF RESULTS

The results of this study indicate that the migraine, psychosomatic and normal control groups used in this study do not differ significantly from each other in terms of scores obtained on the HOQ, CPI and 16PF. Before discussing the results, it must be noted that the sex, age, race, socio-economic and educational criteria for inclusion in any group restricted the groups considerably. This means that one cannot readily generalize the findings to other groups of migraine sufferers, or to groups of sufferers of other psychosomatic disorders or normal control groups.

Acceptance of Null Hypotheses 1a, b, and c.

1. There is no significant difference between migraine sufferers and normal controls in terms of:

a) obsessoid personality traits as measured by the Hysteroid-Obsessoid Questionnaire.

b) interpersonal functioning as measured by the California Psychological Inventory.

c) Personality traits as measured by the Sixteen Personality Factor Test.

These findings are comparable with certain points noted in the literature. In a previous chapter it was noted that despite the impression gained from clinical studies migraine sufferers are characteristically obsessional personalities, by no means

all subjects fitted the description. Selby and Lance (1960) for example, noted that 23% of their migraine subjects displayed characteristically obsessional personality traits. This leaves 77% of the migraine sufferers to be accounted for. It was also noted that we have no way of knowing from these studies whether the reported proportion of migraine sufferers displaying obsessional tendencies is or is not significant. Friedman (1954) whilst maintaining that a predisposition towards certain personality traits exists amongst migraine sufferers, still acknowledges the variability of personality traits amongst them. Even Wolff (1934, 1963) who presented detailed descriptions of the obsessional traits of migraine sufferers pointed out that these traits were not specific to migraine sufferers.

The findings are also compatible with two psychometric studies. Waters and O'Connor (1970) administered the Cornell Medical Index to measure psychoneurosis amongst a migraine and non-migraine headache group selected through a community survey. They found no significant differences between the groups on test scores. Similarly Philips (1976) administered the EPI to migraine, muscular headache and mixed migraine-muscular headache groups and found no significant differences amongst groups on test scores. From the above it can be seen that the acceptance of Ho 1a, b and c is compatible with certain observations and research findings of earlier studies. But what of the observations and research findings with which they appear to be

incompatible? As far as the clinical observational studies are concerned it has been noted that the evidence that certain personality traits are characteristically associated with migraine is by no means clear cut. It has also noted certain limitations of these studies. The most important of these are the lack of a clear objective definition of what is being observed; the lack of objective replicable methods of observation and the lack of control procedures. As such the clinical observations cannot be generalized with great confidence beyond the individuals on whom they were made.

We must, however, examine carefully those psychometric studies in which significant differences on test scores were obtained between migraine sufferers and control groups. Ross and McNaughton (1945) administered the Rorschach to 50 migraine sufferers, as well as to three other clinical and one "symptom-free" control groups. They found that migraine sufferers scored significantly higher on indices of obsessionality than either control group. Only the differences between the migraine sufferers and symptom-free controls will be dealt with, since it is specifically these results that are pertinent to the acceptance of Ho 1a, b, and c. The "symptom-free" control group used by Ross and McNaughton (1945) consisted of individuals all of superior intelligence. There was, however, no control for level of intellectual functioning amongst the migraine group. A major criticism levelled against the Rorschach is based on research indicating that the quality and quantity of responses

to the ink blots are closely associated with intelligence and educational attainment. (Anastasi, 1968) It is possible, therefore, that the differences obtained between the migraine and symptom-free control groups resulted from inadequate control of what appears to be a potentially confounding variable when scoring and interpreting the Rorschach.

If it is assumed however, that Ross and McNaughton (1945) are correct in their conclusions that migraine sufferers are significantly more obsessional than the control groups, then the discrepancy between their results and the results of this study have to be accounted for in terms of differences between the two studies. It has already been noted that the nature of treatment received may be a potentially confounding variable in migraine research. It is here that we observe an important difference between the migraine subjects used in this study and those used by Ross and McNaughton (1945). A large proportion (exact figure not given) of the latters' migraine sample were drawn from an hospital population whereas in this study such subjects were excluded. The conclusions of Ross and McNaughton (1945) that their migraine group was characteristically obsessional may thus be valid, but not generalizable to a non-hospital migraine group such as was used in this study.

Both Maxwell (1966) and Gutt and Rees (1973) found that their migraine subjects obtained significantly higher scores on the Neuroticism Scale of the Eysenck Personality Inventory (EPI)

than control groups. Fouldes et al's (1965) differentiation between symptoms and personality traits has been noted. Symptoms are regarded as being more transient and accounting for a break in behavioural continuity, whilst traits are regarded as the more enduring aspects of psychological functioning, accounting for behavioural continuity. Whereas the N scale of the EPI is a measure of symptomatology, the tests used in this study have been specifically chosen to measure the more enduring personality traits irrespective of symptomatology. The discrepancy in results between the studies of Maxwell (1965) and Gutt and Rees (1973) and the present study may thus be the result the difference in the nature of that aspect of psychological functioning that is being measured. Aitken and Cay (1975) noted a similar discrepancy when the psychological functioning of peptic ulcer patients was assessed. The patients were significantly anxious and depressed when compared to normals but did not differ from normals in terms of more enduring personality traits as measured by the 16PF and Hostility and Direction of Hostility Questionnaire.

Acceptance of Null Hypotheses 2a, b and c

2. There is no significant difference between migraine sufferers and psychosomatic controls in terms of:

a) Obsessoid personality traits as measured by the Hysteroid Obsessoid Questionnaire.

b) interpersonal functioning as measured by the California Psychological Inventory.

c) personality traits as measured by the Sixteen Personality Factor Questionnaire.

Both clinical observational and psychometric studies have been criticised for their failure to include control groups of individuals suffering from psychosomatic disorders other than migraine. This is an important omission since there is overlap amongst the proposed personality characteristics of individuals suffering from different psychosomatic disorders. Ulcerative colitis patients have, for example, been described in terms similar to the descriptions given of migraine patients (Engel, 1975). It has been cautioned against generalizing beyond the restricted samples used in this study. Nevertheless the results do indicate that any attempt to identify the personality traits of migraine sufferers should establish the degree to which these are or are not shared by individuals suffering from other psychosomatic disorders.

The acceptance of Null Hypotheses 3a, b and c

3. There is no significant difference between normal controls and psychosomatic controls in terms of:

a) obsessoid personality traits as measured by the Hysteroid-obsessoid Questionnaire.

b) interpersonal functioning as measured by the California Psychological Inventory.

c) personality traits as measured by the Sixteen Personality Factor Questionnaire.

The broadening of the psychosomatic concept to refer not to a specific category of disorders but to a general approach to all disease has been noted. (Weiss, 1971; Lipouski, 1975). Within this approach psychological factors are regarded as playing a potential role in the precipitation and/or maintenance of any disease and there thus exists no specific category of psychosomatic disorders. If this line of thinking is correct there would be no reason to expect differences between the normal controls and those individuals suffering from disorders traditionally purported to be psychosomatic, since the latter would not exist as a separate group. More research is needed to establish whether this is in fact so.

Thus far the results of this study have been interpreted in terms of factors relating to previous studies. There are, however, other factors to consider.

It has been noted that the groups were narrowly defined in terms of the number of criteria that had to be met for inclusion in any of them. The criteria were established in order to control for possible confounding variables. It is possible, however, that had the criteria for inclusion been broader the three groups would have differed significantly from each other in terms of test scores.

Migraine has been treated in this study as an unitary concept. No differentiation has been made, for example, between classic and common migraine. This is consistent with the way in which migraine is treated in most studies, but may, in fact, be incorrect. Graham (1968) maintains that classic migraine is more likely to occur "out of the blue" and is more likely to be associated with physical precipitating factors (e.g. noise), whereas common migraine more frequently follows a period of tension or stress. Whilst this observation has not been systematically explored in an objective manner, it does suggest the possibility that migraine should not be regarded as a single entity.

Sacks (1970) makes a similar point when he differentiates between different types of migraine on the basis of function within the individuals intra- and interpersonal systems. "Regressive migraines" are, for example, regarded as "cries for help" whereas it is purported that "Agressive migraines . . . provide some form of expression of what cannot be expressed or even acknowledged directly." (Sacks, 1970, p.232). The author provides no objective basis for the way in which he differentiates between six different kinds of migraine on the basis of function and it will perhaps be a while before the techniques are available to do so. This work does, however, raise the possibility that migraine is not an unitary concept.

Buss (1966) suggests that instead of concentrating on differences between groups of individuals suffering from different psycho-

somatic disorders it might be more useful to focus on intra-group differences. Purcell et al (1961, 1962a and b) for example, have been able to distinguish between asthmatic children who require medication to control their symptoms and those who do not. Similarly, if migraine is not a single entity, and if we can establish the dimensions according to which the different categories of migraine can be classified, it may be more appropriate to investigate the differences between these categories instead of those between indifferentiated migraine sufferers and other groups. One could, for example, hypothesise personality differences between those individuals who suffer from migraine when they are angry and those who suffer from migraine when they need comfort.

Wolff (1934; 1963) maintains that the personality traits of migraine sufferers are important in so far as they cause difficulties in the adaptation to the environment and a liability to react excessively to environmental and interpersonal problems. Rees (1973) also suggests that the personality traits of migraine sufferers are important ". . . by virtue of their role in determining the patient's reaction to his environment and in influencing the form and intensity of emotional reactions evoked in response to external factors." (Rees, 1973, p.117). The point made by both authors is that no direct association exists between personality traits and migraine, but rather that these personality traits assume their importance by virtue of the situation in which the individual has to function. Thus for example for the obsessional individual predisposed to migraine it is not his

obsessional personality traits per se that precipitate migraine. It is when that individual finds himself in a situation in which his obsessional traits render him unable to cope, e.g. an unstructured situation in which he has to assume additional responsibility, that he develops migraine. The personality traits of another individual may enable him to cope well with precisely the same situation the obsessional individual cannot cope with, and his migraine may result from being removed from responsibility and placed in the rigid structure required by the obsessional individual.

It is in line with this kind of thinking that Bakal (1975) suggests that, in the absence of being able to identify a migrainous personality, researchers adopt a situationally based approach. By adopting such an approach researchers are not concerned with the personality traits of migraine sufferers in isolation, but with these traits in relation to the situations in which migraine occurs. If such an approach is adopted the psychometric instruments used in this study are inadequate, in that they measure personality traits independently of environmental and transactional contexts.

Conclusions and Implications for Future Research

The results of this study indicate that the migraine, psychosomatic and normal control groups do not differ significantly in terms of personality traits as measured by the HOQ, CIP and 16PF. These results were obtained on groups that were narrowly defined

in terms of criteria for inclusion and may not, therefore, be generalized with confidence to other migraine, psychosomatic and normal control groups. There is nothing, however, to suggest that if this study's hypotheses were tested on different groups, delineated according to the same kind of criteria, the results would be different. There is, for example, no reason to expect that the results would have been different if males aged between 30 to 40 years had been used as subjects. On the basis of the discussion of results it is therefore suggested that research take the following lines:

1. Investigate whether migraine is an unitary concept or whether there exist different kinds of migraine. Graham (1968) differentiates between types of migraine on the basis of symptomatology. Sacks (1970) differentiates between types of migraine on the basis of their strategic function within the self/environment system. Neither author presents objective evidence for their differentiation. It remains for research to identify what, if any, are the meaningful bases for differentiation amongst migraine sufferers and what, if any, is the relationship between different kinds of migraine and personality traits.

2. Investigate the social-environmental dimensions of the situations within which individuals develop migraine. Advances in social-environmental measurement have enabled researchers to demonstrate the associate between dimensions of the social environment and psychosomatic functioning. (Kiritz and Moos, 1974).

An understanding of the dimensions of the social environment associated with migraine would be the first step towards understanding the way in which situational and personality variables interact to precipitate and/or maintain migraine. It would, in other words, be the first step towards a situationally based approach to understanding the role of personality traits, in the precipitation and/or maintenance of migraine.

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Appendix A

HEADACHE QUESTIONNAIRE

1. Are your headaches on one side only?

Please tick

never _____
sometimes _____
usually _____
always _____

2a Before you get a headache do you know that one is coming?

Please tick

YES _____
NO _____

2b If you do, please describe briefly what you notice:

3. When you have a headache do you:

Please tick any that apply.

usually feel sick? _____
ever vomit? _____
usually vomit? _____
always vomit? _____

4. Have you ever been told by a medical practitioner that your headaches are specifically migraines?

5. What treatment have you received for migraines? Please list medicines and any other form of treatment. .....

6. Do other members of your family suffer from migraine? YES _____

NO _____

If yes, please list their relationship to you: e.g. mother, brother:

_____

_____

_____

_____

_____

_____

_____

_____

7. How many attacks, on average, do you have per month?

_____

Appendix B

P. AND P. I. QUESTIONNAIRES

SELF-DESCRIPTION QUESTIONNAIRE (HOQ)

by T. M. CAINE

SURNAME..... CHRISTIAN NAMES.....

AGE..... SEX..... OCCUPATION..... MARITAL STATUS..... DATE.....

Instructions :—

Read over each question and decide whether it is a true description of how you usually act or feel, then put a circle round "True" if the statement describes you or round "False" if it does not. Do not spend too much time over any question. Take your first reaction bearing in mind your usual way of acting or feeling. Do not miss any question. There are no right or wrong answers.

1. I find it hard to think up stories . . . . . True False
2. I like to wear eye-catching clothes . . . . . True False
3. I keep my feelings to myself . . . . . True False
4. I am slow in making up my mind about things because I weigh up all the pros and cons . . . . . True False
5. I am a moody sort of person, with lasting moods . . . . . True False
6. I have rigid standards I feel I should stick to . . . . . True False
7. When I am working I like a job which calls for speed rather than close attention to details . . . . . True False
8. I like to ask for other people's opinions and advice about myself . . . True False
9. I don't feel awkward when meeting people because I know how to behave . True False
10. I prefer to be popular with everyone than to have a few deep lasting friendships True False
11. I cannot shake off my troubles easily even if I get the opportunity . . True False
12. I have a good imagination . . . . . True False
13. I keep quiet at parties or meetings . . . . . True False
14. I feel better after I've had a good row and got it off my chest . . . True False
15. I am quick in sizing up people and situations . . . . . True False
16. My mood is easily changed by what happens around me . . . . True False
17. My conscience seldom bothers me . . . . . True False
18. I keep a place for everything and everything in its place . . . . True False
19. I'm rather lacking in the social graces . . . . . True False
20. I have the same friends now as I had years ago . . . . . True False
21. It pleases me to be the centre of a lively group . . . . . True False
22. I like to show people exactly how I feel about things . . . . . True False
23. The first impressions or reactions are usually the right ones in the end . . True False
24. I do not mind if things turn out badly as long as I know I've done the right thing . . . . . True False

25. I can lead more than one life in my imagination . . . . . True False
26. I like discussing myself with other people . . . . . True False
27. I do not show my emotions in front of people . . . . . True False
28. When someone asks me a question I give a quick answer and look for the reasons later . . . . . True False
29. If I am not in the right mood for something it takes a lot to make me feel differently . . . . . True False
30. I usually get by without having to worry about whether I've done the right thing morally or not . . . . . True False

31. One can understand most things without having to go into all the details . True False
32. It is important to be fashionable in your opinions, clothes, etc. . . . . True False
33. My party manners are pretty good . . . . . True False
34. The only friends I make I keep . . . . . True False
35. If I happen to be upset about something it seems to carry over into all I do for a long time . . . . . True False
36. I cannot completely lose myself in a book or story . . . . . True False

37. I like to sit in the background or in an inconspicuous place at socials, meetings, etc. . . . . True False
38. I act out my feelings . . . . . True False
39. I wait until I am sure of all my facts before I make a decision . . . . True False
40. I spend a good deal of time worrying about the rights and wrongs of conduct True False
41. When going into a room or meeting someone for the first time I get a strong general impression first and only gradually take in the details . . . True False
42. When meeting people I haven't met before I usually feel I make a rather poor impression . . . . . True False

43. It upsets me to leave friends and make new ones even if I have to. . . . True False
44. When watching a play I identify myself with the characters . . . . True False
45. My feelings about things and towards other people seldom change . . True False
46. I do not like taking a leading part in group activities . . . . . True False
47. Mistakes are usually made when people make snap decisions . . . . True False
48. If two people find they disagree about things they shouldn't try to carry on being close friends . . . . . True False

Appendix C

California Psychological Inventory

CPI

HARRISON G. GOUGH, Ph.D.

DIRECTIONS:

This booklet contains a series of statements. Read each one, decide how you feel about it, and then mark your answer *on the special answer sheet.* MAKE NO MARKS ON THE TEST BOOKLET. If you *agree* with a statement, or feel that it is true about you, answer TRUE. If you *disagree* with a statement, or feel that it is not true about you, answer FALSE.

If you find a few questions which you cannot or prefer not to answer, they may be omitted. However, in marking your answers on the answer sheet, make sure that the number of the statement is the same as the number on the answer sheet.

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1. I enjoy social gatherings just to be with people.
2. The only interesting part of the newspaper is the "funnies."
3. I looked up to my father as an ideal man.
4. A person needs to "show off" a little now and then.
5. Our thinking would be a lot better off if we would just forget about words like "probably," "approximately," and "perhaps."
6. I have a very strong desire to be a success in the world.
7. When in a group of people I usually do what the others want rather than make suggestions.
8. I liked "Alice in Wonderland" by Lewis Carroll.
9. I usually go to the movies more than once a week.
10. Some people exaggerate their troubles in order to get sympathy.
11. People can pretty easily change me even though I thought that my mind was already made up on a subject.
12. I often feel that I made a wrong choice in my occupation.
13. I am very slow in making up my mind.
14. I always follow the rule: business before pleasure.
15. Several times a week I feel as if something dreadful is about to happen.
16. There's no use in doing things for people; you only find that you get it in the neck in the long run.
17. I would like to be a journalist.
18. A person who doesn't vote is not a good citizen.
19. I think I would like the work of a building contractor.
20. I have had very peculiar and strange experiences.
21. My daily life is full of things that keep me interested.
22. When a person "pads" his income tax report so as to get out of some of his taxes, it is just as bad as stealing money from the government.
23. In most ways the poor man is better off than the rich man.
24. I always like to keep my things neat and tidy and in good order.
25. Clever, sarcastic people make me feel very uncomfortable.
26. It's a good thing to know people in the right places so you can get traffic tags, and such things, taken care of.
27. It makes me feel like a failure when I hear of the success of someone I know well.
28. I think I would like the work of a dress designer.
29. I am often said to be hotheaded.
30. I gossip a little at times.
31. I doubt whether I would make a good leader.
32. I tend to be on my guard with people who are somewhat more friendly than I had expected.
33. Usually I would prefer to work with women.
34. There are a few people who just cannot be trusted.
35. I become quite irritated when I see someone spit on the sidewalk.
36. When I was going to school I played hooky quite often.
37. I have very few fears compared to my friends.
38. It is hard for me to start a conversation with strangers.
39. I must admit that I enjoy playing practical jokes on people.
40. I get very nervous if I think that someone is watching me.
41. For most questions there is just one right answer, once a person is able to get all the facts.

42. I sometimes pretend to know more than I really do.
43. It's no use worrying my head about public affairs; I can't do anything about them anyhow.
44. Sometimes I feel like smashing things.
45. As a child I used to be able to go to my parents with my problems.
46. I think I would like the work of a school teacher.
47. Women should not be allowed to drink in cocktail bars.
48. Most people would tell a lie if they could gain by it.
49. When someone does me a wrong I feel I should pay him back if I can, just for the principle of the thing.
50. I seem to be about as capable and smart as most others around me.
51. Every family owes it to the city to keep their sidewalks cleared in the winter and their lawn mowed in the summer.
52. I usually take an active part in the entertainment at parties.
53. I think I would enjoy having authority over other people.
54. I find it hard to keep my mind on a task or job.
55. Some of my family have quick tempers.
56. I hate to be interrupted when I am working on something.
57. I have sometimes stayed away from another person because I feared doing or saying something that I might regret afterwards.
58. I get very tense and anxious when I think other people are disapproving of me.
59. The trouble with many people is that they don't take things seriously enough.
60. I have often met people who were supposed to be experts who were no better than I.
61. I liked school.
62. I think Lincoln was greater than Washington.
63. It is always a good thing to be frank.
64. A windstorm terrifies me.
65. I think I would like the work of a clerk in a large department store.
66. Sometimes I feel like swearing.
67. I feel sure that there is only one true religion.
68. I am embarrassed by dirty stories.
69. I would disapprove of anyone's drinking to the point of intoxication at a party.
70. Sometimes I cross the street just to avoid meeting someone.
71. I get excited very easily.
72. I used to keep a diary.
73. Maybe some minority groups do get rough treatment, but it's no business of mine.
74. It is very hard for me to tell anyone about myself.
75. We ought to worry about our own country and let the rest of the world take care of itself.
76. I often feel as if the world was just passing me by.
77. When I get bored I like to stir up some excitement.
78. I like to boast about my achievements every now and then.
79. I am afraid of deep water.
80. There have been times when I have been very angry.
81. I must admit I often try to get my own way regardless of what others may want.
82. I think I would like the work of a garage mechanic.
83. I usually feel nervous and ill at ease at a formal dance or party.
84. I have at one time or another in my life tried my hand at writing poetry.
85. I don't like to undertake any project unless I have a pretty good idea as to how it will turn out.

86. Most of the arguments or quarrels I get into are over matters of principle.

87. I like adventure stories better than romantic stories.

88. I do not like to see people carelessly dressed.

89. Once a week or oftener I feel suddenly hot all over, without apparent cause.

90. As long as a person votes every four years, he has done his duty as a citizen.

91. Sometimes I think of things too bad to talk about.

92. People often expect too much of me.

93. I would do almost anything on a dare.

94. With things going as they are, it's pretty hard to keep up hope of amounting to something.

95. The idea of doing research appeals to me.

96. I take a rather serious attitude toward ethical and moral issues.

97. I would like the job of a foreign correspondent for a newspaper.

98. People today have forgotten how to feel properly ashamed of themselves.

99. I cannot keep my mind on one thing.

100. I prefer a shower to a bathtub.

101. I must admit that I often do as little work as I can get by with.

102. I like to be the center of attention.

103. I like to listen to symphony orchestra concerts on the radio.

104. I would like to see a bullfight in Spain.

105. I am fascinated by fire.

106. The average person is not able to appreciate art and music very well.

107. I can be friendly with people who do things which I consider wrong.

108. I have no dread of going into a room by myself where other people have already gathered and are talking.

109. I get pretty discouraged sometimes.

110. The thought of being in an automobile accident is very frightening to me.

111. When in a group of people I have trouble thinking of the right things to talk about.

112. I set a high standard for myself and I feel others should do the same.

113. School teachers complain a lot about their pay, but it seems to me that they get as much as they deserve.

114. At times I feel like picking a fist fight with someone.

115. Sometimes I have the same dream over and over.

116. It is annoying to listen to a lecturer who cannot seem to make up his mind as to what he really believes.

117. I don't blame anyone for trying to grab all he can get in this world.

118. I believe we are made better by the trials and hardships of life.

119. Planning one's activities in advance is very likely to take most of the fun out of life.

120. I do not always tell the truth.

121. I was a slow learner in school.

122. I like poetry.

123. I think I am stricter about right and wrong than most people.

124. I am likely not to speak to people until they speak to me.

125. There is something wrong with a person who can't take orders without getting angry or resentful.

126. I do not dread seeing a doctor about a sickness or injury.

127. I always try to consider the other fellow's feelings before I do something.

128. It takes a lot of argument to convince most people of the truth.

129. I think I would like to drive a racing car.

130. Sometimes without any reason or even when things are going wrong I feel excitedly happy, "on top of the world."

131. One of my aims in life is to accomplish something that would make my mother proud of me.

132. I fall in and out of love rather easily.

133. I feel as good now as I ever have.

134. It makes me uncomfortable to put on a stunt at a party even when others are doing the same sort of thing.

135. I wake up fresh and rested most mornings.

136. Most people make friends because friends are likely to be useful to them.

137. I wish I were not bothered by thoughts about sex.

138. I seldom or never have dizzy spells.

139. It is all right to get around the law if you don't actually break it.

140. I enjoy hearing lectures on world affairs.

141. Parents are much too easy on their children nowadays.

142. Most people will use somewhat unfair means to gain profit or an advantage rather than to lose it.

143. I like to be with a crowd who play jokes on one another.

144. I am somewhat afraid of the dark.

145. I have a tendency to give up easily when I meet difficult problems.

146. I would like to wear expensive clothes.

147. I certainly feel useless at times.

148. I believe women should have as much sexual freedom as men.

149. I consider a matter from every standpoint before I make a decision.

150. Criticism or scolding makes me very uncomfortable.

151. I have strange and peculiar thoughts.

152. I read at least ten books a year.

153. If I am not feeling well I am somewhat cross and grouchy.

154. I like tall women.

155. A person should adapt his ideas and his behavior to the group that happens to be with him at the time.

156. I hardly ever get excited or thrilled.

157. I have the wanderlust and am never happy unless I am roaming or traveling about.

158. I frequently notice my hand shakes when I try to do something.

159. I feel nervous if I have to meet a lot of people.

160. I would like to hear a great singer in an opera.

161. I am sometimes cross and grouchy without any good reason.

162. Every citizen should take the time to find out about national affairs, even if it means giving up some personal pleasures.

163. I like parties and socials.

164. My parents have often disapproved of my friends.

165. I do not mind taking orders and being told what to do.

166. In school I always looked far ahead in planning what courses to take.

167. I should like to belong to several clubs or lodges.

168. My home life was always happy.

169. Teachers often expect too much work from the students.

170. I often act on the spur of the moment without stopping to think.

171. I think I could do better than most of the present politicians if I were in office.

172. I do not have a great fear of snakes.

173. My way of doing things is apt to be misunderstood by others.

174. I never make judgments about people until I am sure of the facts.

175. I have had blank spells in which my activities were interrupted and I did not know what was going on around me.

176. I commonly wonder what hidden reason another person may have for doing something nice for me.

177. I am certainly lacking in self-confidence.

178. Most people are secretly pleased when someone else gets into trouble.

179. When I work on a committee I like to take charge of things.

180. My parents have generally let me make my own decisions.

181. I always tried to make the best school grades that I could.

182. I would rather go without something than ask for a favor.

183. Sometimes I feel as if I must injure either myself or someone else.

184. I have had more than my share of things to worry about.

185. I often do whatever makes me feel cheerful here and now, even at the cost of some distant goal.

186. I usually don't like to talk much unless I am with people I know very well.

187. I am inclined to take things hard.

188. I am quite often not in on the gossip and talk of the group I belong to.

189. In school my marks in deportment were quite regularly bad.

190. Only a fool would ever vote to increase his own taxes.

191. I can remember "playing sick" to get out of something.

192. When I meet a stranger I often think that he is better than I am.

193. I would be ashamed not to use my privilege of voting.

194. I like to keep people guessing what I'm going to do next.

195. The most important things to me are my duties to my job and to my fellowman.

196. I think I would like to fight in a boxing match sometime.

197. Once in a while I laugh at a dirty joke.

198. Before I do something I try to consider how my friends will react to it.

199. I would like to be a soldier.

200. In a group of people I would not be embarrassed to be called upon to start a discussion or give an opinion about something I know well.

201. I have no patience with people who believe there is only one true religion.

202. If given the chance I would make a good leader of people.

203. When things go wrong I sometimes blame the other fellow.

204. I like to plan a home study schedule and then follow it.

205. I enjoy a race or game better when I bet on it.

206. I have often found people jealous of my good ideas, just because they had not thought of them first.

207. Sometimes at elections I vote for men about whom I know very little.

208. I like to go to parties and other affairs where there is lots of loud fun.

209. Most people are honest chiefly through fear of being caught.

210. I very much like hunting.

211. I have frequently found myself, when alone, pondering such abstract problems as freewill, evil, etc.

212. I have never been in trouble with the law.

213. It makes me angry when I hear of someone who has been wrongly prevented from voting.

214. In school I was sometimes sent to the principal for cutting up.

215. I would like to write a technical book.

216. At times I have worn myself out by undertaking too much.

217. I think I would like the work of a librarian.

218. I love to go to dances.

219. Most people inwardly dislike putting themselves out to help other people.

220. I feel uneasy indoors.

221. People have a real duty to take care of their aged parents, even if it means making some pretty big sacrifices.

222. I would like to belong to a discussion and study club.

223. I keep out of trouble at all costs.

224. I usually expect to succeed in things I do.

225. People pretend to care more about one another than they really do.

226. Most people worry too much about sex.

227. It is hard for me to find anything to talk about when I meet a new person.

228. I like to read about history.

229. I much prefer symmetry to asymmetry.

230. I would rather be a steady and dependable worker than a brilliant but unstable one.

231. I am apt to show off in some way if I get the chance.

232. Sometimes I feel that I am about to go to pieces.

233. A person does not need to worry about other people if only he looks after himself.

234. We ought to pay our elected officials better than we do.

235. I can honestly say that I do not really mind paying my taxes because I feel that's one of the things I can do for what I get from the community.

236. I am so touchy on some subjects that I can't talk about them.

237. The future is too uncertain for a person to make serious plans.

238. Sometimes I just can't seem to get going.

239. I like to talk before groups of people.

240. I would like to be a nurse.

241. The man who provides temptation by leaving valuable property unprotected is about as much to blame for its theft as the one who steals it.

242. I am a good mixer.

243. I am often bothered by useless thoughts which keep running through my mind.

244. If I were a reporter I would like very much to report news of the theater.

245. Most of the time I feel happy.

246. I like to plan out my activities in advance.

247. When a man is with a woman he is usually thinking about things related to her sex.

248. I must admit that I have a bad temper, once I get angry.

249. I like mechanics magazines.

250. I must admit I find it very hard to work under strict rules and regulations.

251. I like large, noisy parties.

252. I sometimes feel that I am a burden to others.

253. When prices are high you can't blame a person for getting all he can while the getting is good.

254. I have never deliberately told a lie.

255. Only a fool would try to change our American way of life.

256. I want to be an important person in the community.

257. I often feel as though I have done something wrong or wicked.

258. In school I found it very hard to talk before the class.

259. I usually feel that life is worthwhile.

260. I always try to do at least a little better than what is expected of me.

261. We ought to let Europe get out of its own mess; it made its bed, let it lie in it.

262. There have been a few times when I have been very mean to another person.

263. Lawbreakers are almost always caught and punished.

264. I would be very unhappy if I was not successful at something I had seriously started to do.

265. I dread the thought of an earthquake.

266. I think most people would lie to get ahead.

267. I am a better talker than a listener.

268. At times I have been very anxious to get away from my family.

269. I like science.

270. I often lose my temper.

271. My parents were always very strict and stern with me.

272. I must admit I feel sort of scared when I move to a strange place.

273. I am bothered by people outside, on streetcars, in stores, etc., watching me.

274. I'm pretty sure I know how we can settle the international problems we face today.

275. Sometimes I rather enjoy going against the rules and doing things I'm not supposed to.

276. I have very few quarrels with members of my family.

277. I have no fear of water.

278. If I get too much change in a store, I always give it back.

279. I often get disgusted with myself.

280. I enjoy many different kinds of play and recreation.

281. Society owes a lot more to the businessman and the manufacturer than it does to the artist and the professor.

282. A large number of people are guilty of bad sexual conduct.

283. I like to read about science.

284. It is hard for me to act natural when I am with new people.

285. I refuse to play some games because I am not good at them.

286. I have never done anything dangerous for the thrill of it.

287. I think I would like to belong to a singing club.

288. As a youngster I was suspended from school one or more times for cutting up.

289. There have been times when I have worried a lot about something that was not really important.

290. I have never been in trouble because of my sex behavior.

291. I think I would like to belong to a motorcycle club.

292. I used to like it very much when one of my papers was read to the class in school.

293. Every now and then I get into a bad mood, and no one can do anything to please me.

294. I feel that I have often been punished without cause.

295. I would be willing to give money myself in order to right a wrong, even though I was not mixed up in it in the first place.

296. I would like to be an actor on the stage or in the movies.

297. At times I have a strong urge to do something harmful or shocking.

298. I often get feelings like crawling, burning, tingling, or "going to sleep" in different parts of my body.

299. I don't seem to care what happens to me.

300. Police cars should be especially marked so that you can always see them coming.

301. I am afraid to be alone in the dark.

302. I have often gone against my parents' wishes.

303. We should cut down on our use of oil, if necessary, so that there will be plenty left for the people fifty or a hundred years from now.

304. When the community makes a decision, it is up to a person to help carry it out even if he had been against it.

305. I often wish people would be more definite about things.

306. I have nightmares every few nights.

307. If I am driving a car, I try to keep others from passing me.

308. I have a great deal of stomach trouble.

309. I have been afraid of things or people that I knew could not hurt me.

310. I would rather have people dislike me than look down on me.

311. I cannot do anything well.

312. Any man who is able and willing to work hard has a good chance of succeeding.

313. I hardly ever feel pain in the back of the neck.

314. I must admit I try to see what others think before I take a stand.

315. People should not have to pay taxes for the schools if they do not have children.

316. My parents wanted me to "make good" in the world.

317. I often think about how I look and what impression I am making upon others.

318. When I was a child I didn't care to be a member of a crowd or gang.

319. In a group, I usually take the responsibility for getting people introduced.

320. I would be willing to describe myself as a pretty "strong" personality.

321. I almost never go to sleep.

322. I do not like to loan my things to people who are careless in the way they take care of them.

323. I have never done any heavy drinking.

324. Voting is nothing but a nuisance.

325. When I am feeling very happy and active, someone who is blue or low will spoil it all.

326. It is annoying to listen to a lecturer who cannot seem to make up his mind as to what he really believes.

327. I find it easy to "drop" or "break with" a friend.

328. I find that a well-ordered mode of life with regular hours is congenial to my temperament.

329. It is hard for me to sympathize with someone who is always doubting and unsure about things.

330. Everything tastes the same.

331. I often start things I never finish.

332. I could be perfectly happy without a single friend.

333. Education is more important than most people think.

334. I get nervous when I have to ask someone for a job.

335. There are times when I act like a coward.

336. Sometimes I used to feel that I would like to leave home.

337. Much of the time my head seems to hurt all over.

338. I never worry about my looks.

339. I have been in trouble one or more times because of my sex behavior.

340. Our thinking would be a lot better off if we would just forget about words like "probably," "approximately," and "perhaps."

341. My people treat me more like a child than a grown-up.

342. Some people exaggerate their troubles in order to get sympathy.

343. In school most teachers treated me fairly and honestly.

344. I am made nervous by certain animals.

345. I go out of my way to meet trouble rather than try to escape it.

346. I must admit I am a pretty fair talker.

347. I never make judgments about people until I am sure of the facts.

348. I usually try to do what is expected of me, and to avoid criticism.

349. If a person is clever enough to cheat someone out of a large sum of money, he ought to be allowed to keep it.

350. A person should not be expected to do anything for his community unless he is paid for it.

351. Some of my family have habits that bother and annoy me very much.

352. I must admit I have no great desire to learn new things.

353. No one seems to understand me.

354. A strong person will be able to make up his mind even on the most difficult questions.

355. I have strong political opinions.

356. I seldom worry about my health.

357. For most questions there is just one right answer, once a person is able to get all the facts.

358. I dream frequently about things that are best kept to myself.

359. I think I am usually a leader in my group.

360. It is impossible for an honest man to get ahead in the world.

361. I like to have a place for everything and everything in its place.

362. I have never seen a vision.

363. I don't like to work on a problem unless there is the possibility of coming out with a clear-cut and unambiguous answer.

364. It bothers me when something unexpected interrupts my daily routine.

365. The future seems hopeless to me.

366. I never seem to get hungry.

367. My home life was always very pleasant.

368. I have had no difficulty starting or holding my urine.

369. I seem to do things that I regret more often than other people do.

370. Disobedience to any government is never justified.

371. I would rather be a steady and dependable worker than a brilliant but unstable one.

372. I have reason for feeling jealous of one or more members of my family.

373. My table manners are not quite as good at home as when I am out in company.

374. I would never go out of my way to help another person if it meant giving up some personal pleasure.

375. There are certain people whom I dislike so much that I am inwardly pleased when they are catching it for something they have done.

376. I enjoy planning things, and deciding what each person should do.

377. Most of the arguments or quarrels I get into are over matters of principle.

378. I doubt if anyone is really happy.

379. I would rather not have very much responsibility for other people.

380. I am known as a hard and steady worker.

381. My mouth feels dry almost all the time.

382. Success is a matter of will power.

383. I usually have to stop and think before I act even in trifling matters.

384. Most people would be better off if they never went to school at all.

385. It is pretty easy for people to win arguments with me.

386. I know who is responsible for most of my troubles.

387. I don't like things to be uncertain and unpredictable.

388. When I am cornered I tell that portion of the truth which is not likely to hurt me.

389. I get pretty discouraged with the law when a smart lawyer gets a criminal free.

390. I have not lived the right kind of life.

391. I am quite a fast reader.

392. I daydream very little.

393. I have used alcohol excessively.

394. Even when I have gotten into trouble I was usually trying to do the right thing.

395. It is very important to me to have enough friends and social life.

396. I sometimes wanted to run away from home.

397. Once I have my mind made up I seldom change it.

398. Life usually hands me a pretty raw deal.

399. At times I have been so entertained by the cleverness of a crook that I have hoped he would get by with it.

400. I think I am stricter about right and wrong than most people.

401. Most young people get too much education.

402. I have had attacks in which I could not control my movements or speech, but in which I knew what was going on around me.

403. I have a natural talent for influencing people.

404. I am in favor of a very strict enforcement of all laws, no matter what the consequences.

405. People often talk about me behind my back.

406. I have one or more bad habits which are so strong that it is no use fighting against them.

407. I have had no difficulty in starting or holding my bowel movement.

408. I always see to it that my work is carefully planned and organized.

409. I would never play cards (poker) with a stranger.

410. I regard the right to speak my mind as very important.

411. I am bothered by acid stomach several times a week.

412. I like to give orders and get things moving.

413. I get all the sympathy I should.

414. I do not read every editorial in the newspaper every day.

415. I have felt embarrassed over the type of work that one or more members of my family have done.

416. I don't think I'm quite as happy as others seem to be.

417. Any job is all right with me, so long as it pays well.

418. I am embarrassed with people I do not know well.

419. It often seems that my life has no meaning.

420. I used to steal sometimes when I was a youngster.

421. I don't really care whether people like me or dislike me.

422. I feel like giving up quickly when things go wrong.

423. If people had not had it in for me I would have been much more successful.

424. The one to whom I was most attached and whom I most admired as a child was a woman (mother, sister, aunt, or other woman).

425. I have often felt guilty because I have pretended to feel more sorry about something than I really was.

426. There have been times when I have been very angry.

427. There are a few people who just cannot be trusted.

428. My home as a child was less peaceful and quiet than those of most other people.

429. Even the idea of giving a talk in public makes me afraid.

430. The things some of my family have done have frightened me.

431. As a youngster in school I used to give the teachers lots of trouble.

432. I am not afraid of picking up a disease or germs from doorknobs.

433. It is more important that a father be kind than that he be successful.

434. My skin seems to be unusually sensitive to touch.

435. If the pay was right I would like to travel with a circus or carnival.

436. I never cared much for school.

437. I am troubled by attacks of nausea and vomiting.

438. I would have been more successful if people had given me a fair chance.

439. The members of my family were always very close to each other.

440. There are times when I have been discouraged.

441. I have often been frightened in the middle of the night.

442. The trouble with many people is that they don't take things seriously enough.

443. I'm not the type to be a political leader.

444. My parents never really understood me.

445. I would fight if someone tried to take my rights away.

446. I must admit that people sometimes disappoint me.

447. If I saw some children hurting another child, I am sure I would try to make them stop.

448. People seem naturally to turn to me when decisions have to be made.

449. Almost every day something happens to frighten me.

450. I get sort of annoyed with writers who go out of their way to use strange and unusual words.

451. I set a high standard for myself and I feel others should do the same.

452. I dislike to have to talk in front of a group of people.

453. I work under a great deal of tension.

454. My family has objected to the kind of work I do, or plan to do.

455. There seems to be a lump in my throat much of the time.

456. I have more trouble concentrating than others seem to have.

457. A person is better off if he doesn't trust anyone.

458. People who seem unsure and uncertain about things make me feel uncomfortable.

459. My sleep is fitful and disturbed.

460. A strong person doesn't show his emotions and feelings.

461. It seems that people used to have more fun than they do now.

462. Even though I am sure I am in the right, I usually give in because it is foolish to cause trouble.

463. It is hard for me just to sit still and relax.

464. From time to time I like to get completely away from work and anything that reminds me of it.

465. I must admit that I am a high-strung person.

466. I am a very ticklish person.

467. At times I think I am no good at all.

468. I like to eat my meals quickly and not spend a lot of time at the table visiting and talking.

469. I must admit that it makes me angry when other people interfere with my daily activity.

470. If a person doesn't get a few lucky breaks in life it just means that he hasn't been keeping his eyes open.

471. I sometimes feel that I do not deserve as good a life as I have.

472. I feel that I would be a much better person if I could gain more understanding of myself.

473. I can't really enjoy a rest or vacation unless I have earned it by some hard work.

474. I sometimes tease animals.

475. I have a good appetite.

476. I had my own way as a child.

477. I get tired more easily than other people seem to.

478. I would be uncomfortable in anything other than fairly conventional dress.

479. I sweat very easily even on cool days.

480. I must admit it would bother me to put a worm on a fish hook.

Appendix D

1967-68 EDITION

California Psychological Inventory

FORM A

START HERE

DIRECTIONS: Be sure to fill in your name and other information requested. Then answer TRUE (T) or FALSE (F) for each statement by putting an X in the appropriate box, as in the example at right.

T
F

EXAMPLE ONLY

X		
1	2	3

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
33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
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	89	90
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
123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150
153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
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
213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270
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
303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330
333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360
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
393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420
423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450
453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480

T
F

AGE

SEX

DATE

...Manual for the California Psychological Inventory.

...LOW THIS LINE

CONSULTING PSYCHOLOGISTS PRESS, INC.
Palo Alto, California

Appendix D

1967-68 EDITION

FORM A

16 PF

If a separate "Answer Sheet" has not been given to you, turn this booklet over and tear off the Answer Sheet on the back page.

Write your name and all other information asked for on the top line of the Answer Sheet.

First you should answer the four sample questions below so that you can see whether you need to ask anything before starting. Although you are to read the questions in this booklet, you must record your answers on the answer sheet (alongside the same number as in the booklet).

There are three possible answers to each question. Read the following examples and mark your answers at the top of your answer sheet where it says "Examples." Fill in the left-hand box if your answer choice is the "a" answer, in the middle box if your answer choice is the "b" answer, and in the right-hand box if you choose the "c" answer.

EXAMPLES:

1. I like to watch team games.
   a. yes, b. occasionally, c. no.
2. I prefer people who:
   a. are reserved,
   b. (are) in between,
   c. make friends quickly.
3. Money cannot bring happiness.
   a. yes (true), b. in between, c. no (false).
4. Woman is to child as cat is to:
   a. kitten, b. dog, c. boy.

In the last example there *is* a right answer—kitten. But there are very few such reasoning items.

When you answer, keep these four points in mind:

1. You are asked not to spend time pondering. Give the first, natural answer as it comes to you. Of course, the questions are too short to give you all the particulars you would sometimes like to have. For instance, the above question asks you about "team games" and you might be fonder of football than basketball. But you are to reply "for the average game," or to strike an average in situations of the kind stated. Give the best answer you can at a rate not slower than five or six a minute. You should finish in a little more than half an hour.
2. Try not to fall back on the middle, "uncertain" answers except when the answer at either end is really impossible for you—perhaps once every four or five questions.
3. Be sure not to skip anything, but answer every question, somehow. Some may not apply to you very well, but give your best guess. Some may seem personal; but remember that the answer sheets are kept confidential and cannot be scored without a special stencil key. Answers to particular questions are not inspected.
4. Answer as honestly as possible what is true of you. Do not merely mark what seems "the right thing to say" to impress the examiner.

1. I have the instructions for this test clearly in mind.
   a. yes, b. uncertain, c. no.

2. I am ready to answer each question as truthfully as possible.
   a. yes, b. uncertain, c. no.

3. I would rather have a house:
   a. in a sociable suburb,
   b. in between,
   c. alone in the deep woods.

4. I can find enough energy to face my difficulties.
   a. always, b. generally, c. seldom.

5. I feel a bit nervous of wild animals even when they are in strong cages.
   a. yes (true), b. uncertain, c. no (false).

6. I hold back from criticizing people and their ideas.
   a. yes, b. sometimes, c. no.

7. I make smart, sarcastic remarks to people if I think they deserve it.
   a. generally, b. sometimes, c. never.

8. I prefer semiclassical music to popular tunes.
   a. true, b. uncertain, c. false.

9. If I saw two neighbors' children fighting, I would:
   a. leave them to settle it,
   b. uncertain,
   c. reason with them.

10. On social occasions I:
    a. readily come forward,
    b. in between,
    c. prefer to stay quietly in the background.

11. It would be more interesting to be:
    a. a construction engineer,
    b. uncertain,
    c. a writer of plays.

12. I would rather stop in the street to watch an artist painting than listen to some people having a quarrel.
    a. true, b. uncertain, c. false.

13. I can generally put up with conceited people, even though they brag or show they think too well of themselves.
    a. yes, b. in between, c. no.

14. You can almost always notice on a man's face when he is dishonest.
    a. yes, b. in between, c. no.

15. It would be good for everyone if vacations (holidays) were longer and everyone *had* to take them.
    a. agree, b. uncertain, c. disagree.

16. I would rather take the gamble of a job with possibly large but uneven earnings, than one with a steady, small salary.
    a. yes, b. uncertain, c. no.

17. I talk about my feelings:
    a. only if necessary,
    b. in between,
    c. readily, whenever I have a chance.

18. Once in a while I have a sense of vague danger or sudden dread for reasons that I do not understand.
    a. yes, b. in between, c. no.

19. When criticized wrongly for something I did *not* do, I:
    a. have no feeling of guilt,
    b. in between,
    c. still feel a bit guilty.

20. Money can buy almost everything.
    a. yes, b. uncertain, c. no.

21. My decisions are governed more by my:
    a. heart,
    b. feelings and reason equally,
    c. head.

22. Most people would be happier if they lived more with their fellows and did the same things as others.
    a. yes, b. in between, c. no.

23. I occasionally get puzzled, when looking in a mirror, as to which is my right and left.
    a. true, b. uncertain, c. false.

24. When talking, I like:
    a. to say things, just as they occur to me,
    b. in between,
    c. to get my thoughts well organized first.

25. When something really makes me furious, I find I calm down again quite quickly.
    a. yes, b. in between, c. no.

(End, column 1 on answer sheet.)

With the same hours and pay, it would be more interesting to be:
a. a carpenter or cook,
b. uncertain,
c. a waiter in a good restaurant.

I have been elected to:
a. only a few offices,
b. several,
c. many offices.

"Spade" is to "dig" as "knife" is to:
a. sharp, b. cut, c. point.

I sometimes can't get to sleep because an idea keeps running through my mind.
a. true, b. uncertain, c. false.

In my personal life I reach the goals I set, almost all the time.
a. true, b. uncertain, c. false.

An out-dated law should be changed:
a. only after considerable discussion,
b. in between,
c. promptly.

I am uncomfortable when I work on a project requiring quick action affecting others.
a. true, b. in between, c. false.

Most of the people I know would rate me as an amusing talker.
a. yes, b. uncertain, c. no.

When I see "sloppy," untidy people, I:
a. just accept it,
b. in between,
c. get disgusted and annoyed.

I get slightly embarrassed if I suddenly become the focus of attention in a social group.
a. yes, b. in between, c. no.

I am always glad to join a large gathering, for example, a party, dance, or public meeting.
a. yes, b. in between, c. no.

In school I preferred (or prefer):
a. music,
b. uncertain,
c. handwork and crafts.

When I have been put in charge of something, I insist that my instructions are followed or else I resign.
a. yes, b. sometimes, c. no.

39. For parents, it is more important to:
a. help their children develop their affections,
b. in between,
c. teach their children how to control emotions.

40. In a group task I would rather:
a. try to improve arrangements,
b. in between,
c. keep the records and see that rules are followed.

41. I feel a need every now and then to engage in a tough physical activity.
a. yes, b. in between, c. no.

42. I would rather mix with polite people than rough, rebellious individuals.
a. yes, b. in between, c. no.

43. I feel terribly dejected when people criticize me in a group.
a. true, b. in between, c. false.

44. If I am called in by my boss, I:
a. make it a chance to ask for something I want,
b. in between,
c. fear I've done something wrong.

45. What this world needs is:
a. more steady and "solid" citizens,
b. uncertain,
c. more "idealists" with plans for a better world.

46. I am always keenly aware of attempts at propaganda in things I read.
a. yes, b. uncertain, c. no.

47. As a teenager, I joined in school sports:
a. occasionally,
b. fairly often,
c. a great deal.

48. I keep my room well organized, with things in known places almost all the time.
a. yes, b. in between, c. no.

49. I sometimes get in a state of tension and turmoil as I think of the day's happenings.
a. yes, b. in between, c. no.

50. I sometimes doubt whether people I am talking to are really interested in what I am saying.
a. yes, b. in between, c. no.

(End, column 2 on answer sheet.)

I had to choose, I would rather be:
a forester,
uncertain,
a high school teacher.

r special holidays and birthdays, I:
like to give personal presents,
uncertain,
feel that buying presents is a bit of a nuisance.

ired" is to "work" as "proud" is to:
smile, b. success, c. happy.

hich of the following items is different in d from the others?
candle, b. moon, c. electric light.

ave been let down by my friends:
hardly ever,
occasionally,
quite a lot.

ave some characteristics in which I feel finitely superior to most people.
yes, b. uncertain, c. no.

en I get upset, I try hard to hide my feel- s from others.
true, b. in between, c. false.

ke to go out to a show or entertainment:
more than once a week (more than average),
about once a week (average),
ess than once a week (less than average).

hink that plenty of freedom is more impor- t than good manners and respect for the
true, b. uncertain, c. false.

nd to keep quiet in the presence of senior sons (people of greater experience, age, or
yes, b. in between, c. no.

nd it hard to address or recite to a large up.
yes, b. in between, c. no.

ve a good sense of direction (find it easy to which is North, South, East, or West) n in a strange place.
yes, b. in between, c. no.

63. If someone got mad at me, I would:
a. try to calm him down,
b. uncertain,
c. get irritated.

64. When I read an unfair magazine article, I am more inclined to forget it than to feel like "hitting back."
a. true, b. uncertain, c. false.

65. My memory tends to drop a lot of unimportant, trivial things, for example, names of streets or stores in town.
a. yes, b. in between, c. no.

66. I could enjoy the life of an animal doctor, handling disease and surgery of animals.
a. yes, b. in between, c. no.

67. I eat my food with gusto, not always so carefully and properly as some people.
a. true, b. uncertain, c. false.

68. There are times when I don't feel in the right mood to see anyone.
a. very rarely,
b. in between,
c. quite often.

69. People sometimes warn me that I show my excitement in voice and manner too obviously.
a. yes, b. in between, c. no.

70. As a teenager, if I differed in opinion from my parents, I usually:
a. kept my own opinion,
b. in between,
c. accepted their authority.

71. I would prefer to have an office of my own, not sharing it with another person.
a. yes, b. uncertain, c. no.

72. I would rather enjoy life quietly in my own way than be admired for my achievements.
a. true, b. uncertain, c. false.

73. I feel mature in most things.
a. true, b. uncertain, c. false.

74. I find myself upset rather than helped by the kind of criticism that many people offer one.
a. often, b. occasionally, c. never.

75. I am always able to keep the expression of my feelings under exact control.
a. yes, b. in between, c. no.

(End, column 3 on answer sheet.)

76. In starting a useful invention, I would prefer:
a. working on it in the laboratory,
b. uncertain,
c. selling it to people.

77. "Surprise" is to "strange" as "fear" is to:
a. brave, b. anxious, c. terrible.

78. Which of the following fractions is not in the same class as the others?
a. 3/7, b. 3/9, c. 3/11.

79. Some people seem to ignore or avoid me, although I don't know why.
a. true, b. uncertain, c. false.

80. People treat me less reasonably than my good intentions deserve.
a. often, b. occasionally, c. never.

81. The use of foul language, even when it is not in a mixed group of men and women, still disgusts me.
a. yes, b. in between, c. no.

82. I have decidedly fewer friends than most people.
a. yes, b. in between, c. no.

83. I would hate to be where there wouldn't be a lot of people to talk to.
a. true, b. uncertain, c. false.

84. People sometimes call me careless, even though they think I'm a likable person.
a. yes, b. in between, c. no.

85. "Stage-fright" in various social situations is something I have experienced:
a. quite often,
b. occasionally,
c. hardly ever.

86. When I am in a small group, I am content to sit back and let others do most of the talking.
a. yes, b. in between, c. no.

87. I prefer reading:
a. a realistic account of military or political battles,
b. uncertain,
c. a sensitive, imaginative novel.

88. When bossy people try to "push me around," I do just the opposite of what they wish.
a. yes, b. in between, c. no.

89. Business superiors or members of my family, as a rule, find fault with me only when there is real cause.
a. true, b. in between, c. false.

90. In streets or stores, I dislike the way some persons stare at people.
a. yes, b. in between, c. no.

91. On a long journey, I would prefer to:
a. read something profound, but interesting,
b. uncertain,
c. pass the time talking casually with a fellow passenger.

92. In a situation which may become dangerous, I believe in making a fuss and speaking up even if calmness and politeness are lost.
a. yes, b. in between, c. no.

93. If acquaintances treat me badly and show they dislike me:
a. it doesn't upset me a bit,
b. in between,
c. I tend to get downhearted.

94. I find it embarrassing to have praise or compliments bestowed on me.
a. yes, b. in between, c. no.

95. I would rather have a job with:
a. a fixed, certain salary,
b. in between,
c. a larger salary, which depended on my constantly persuading people I am worth it.

96. To keep informed, I like:
a. to discuss issues with people,
b. in between,
c. to rely on the actual news reports.

97. I like to take an active part in social affairs, committee work, etc.
a. yes, b. in between, c. no.

98. In carrying out a task, I am not satisfied unless even the minor details are given close attention.
a. true, b. in between, c. false.

99. Quite small setbacks occasionally irritate me too much.
a. yes, b. in between, c. no.

100. I am always a sound sleeper, never walking or talking in my sleep.
a. yes, b. in between, c. no.

(End, column 4 on answer sheet.)

t would be more interesting to work in a
usiness:
talking to customers,
in between,
keeping office accounts and records.

"Size" is to "length" as "dishonest" is to:
prison, b. sin, c. stealing.

AB is to dc as SR is to:
qp, b. pq, c. tu.

When people are unreasonable, I just:
keep quiet,
uncertain,
despise them.

f people talk loudly while I am listening to
usic, I:
can keep my mind on the music and not be
bothered,
in between,
find it spoils my enjoyment and annoys me.

think I am better described as:
polite and quiet,
in between,
forceful.

attend social functions only when I have to,
d stay away any other time.
yes, b. uncertain, c. no.

o be cautious and expect little is better than
be happy at heart, always expecting success.
true, b. uncertain, c. false.

thinking of difficulties in my work, I:
try to plan ahead, before I meet them,
in between,
assume I can handle them when they come.

find it easy to mingle among people at a
cial gathering.
true, b. uncertain, c. false.

hen a bit of diplomacy and persuasion are
eded to get people moving, I am generally
e one asked to do it.
yes, b. in between, c. no.

would be more interesting to be:
a guidance worker helping young people find
jobs,
ncertain,
manager in efficiency engineering.

113. If I am quite sure that a person is unjust or behaving selfishly, I show him up, even if it takes some trouble.
a. yes, b. in between, c no.

114. I sometimes make foolish remarks in fun, just to surprise people and see what they will say.
a. yes, b. in between, c. no.

115. I would enjoy being a newspaper writer on drama, concerts, opera, etc.
a. yes, b. uncertain, c. no.

116. I never feel the urge to doodle and fidget when kept sitting still at a meeting.
a. true, b. uncertain, c. false.

117. If someone tells me something which I know is wrong, I am more likely to say to myself:
a. "He is a liar."
b. in between,
c. "Apparently he is misinformed."

118. I feel some punishment is coming to me even when I have done nothing wrong.
a. often, b. occasionally, c. never.

119. The idea that sickness comes as much from mental as physical causes is much exaggerated.
a. yes, b. in between, c. no.

120. The pomp and splendor of any big state ceremony are things which should be preserved.
a. yes, b. in between, c. no.

121. It bothers me if people think I am being too unconventional or odd.
a. a lot, b. somewhat, c. not at all.

122. In constructing something I would rather work:
a. with a committee,
b. uncertain,
c. on my own.

123. I have periods when it's hard to stop a mood of self-pity.
a. often, b. occasionally, c. never.

124. Often I get angry with people too quickly.
a. yes, b. in between, c. no.

125. I can always change old habits without difficulty and without slipping back.
a. yes, b. in between, c. no.

(End, column 5 on answer sheet.)

If the earnings were the same, I would rather be:
a. a lawyer,
b. uncertain,
c. a navigator or pilot.

"Better" is to "worst" as "slower" is to:
a. fast, b. best, c. quickest.

Which of the following should come next at the end of this row of letters: xoooooxxoooxxx?
a. oxxx, b. ooxx, c. xoeo.

When the time comes for something I have planned and looked forward to, I occasionally do not feel up to going.
a. true, b. in between, c. false.

I can work carefully on most things without being bothered by people making a lot of noise around me.
a. yes, b. in between, c. no.

I occasionally tell strangers things that seem to me important, regardless of whether they ask about them.
a. yes, b. in between, c. no.

I spend much of my spare time talking with friends about social events enjoyed in the past.
a. yes, b. in between, c. no.

I enjoy doing "daring," foolhardy things "just for fun."
a. yes, b. in between, c. no.

I find the sight of an untidy room very annoying.
a. yes, b. in between, c. no.

I consider myself a very sociable, outgoing person.
a. yes, b. in between, c. no.

In social contacts I:
a. show my emotions as I wish,
b. in between,
c. keep my emotions to myself.

I enjoy music that is:
a. light, dry, and brisk,
b. in between,
c. emotional and sentimental.

I admire the beauty of a poem more than that of a well-made gun.
a. yes, b. uncertain, c. no.

139. If a good remark of mine is passed by, I:
a. let it go,
b. in between,
c. give people a chance to hear it again.

140. I would like to work as a probation officer with criminals on parole.
a. yes, b. in between, c. no.

141. One should be careful about mixing with all kinds of strangers, since there are dangers of infection and so on.
a. yes, b. uncertain, c. no.

142. In traveling abroad, I would rather go on an expertly conducted tour than plan by myself the places I wish to visit.
a. yes, b. uncertain, c. no.

143. I am properly regarded as only a plodding, half-successful person.
a. yes, b. uncertain, c. no.

144. If people take advantage of my friendliness, I do not resent it and I soon forget.
a. true, b. uncertain, c. false.

145. If a heated argument developed between other members taking part in a group discussion, I would:
a. like to see a "winner,"
b. in between,
c. wish that it would be smoothed over.

146. I like to do my planning alone, without interruptions and suggestions from others.
a. yes, b. in between, c. no.

147. I sometimes let my actions get swayed by feelings of jealousy.
a. yes, b. in between, c. no.

148. I believe firmly "the boss may not always be right, but he always has the right to be boss."
a. yes, b. uncertain, c. no.

149. I get tense as I think of all the things lying ahead of me.
a. yes, b. sometimes, c. no.

150. If people shout suggestions when I'm playing a game, it doesn't upset me.
a. true, b. uncertain, c. false.

(End, column 6 on answer sheet.)

It would be more interesting to be:
a. an artist,
b. uncertain,
c. a secretary running a club.

Which of the following words does not properly belong with the others?
a. any, b. some, c. most.

"Flame" is to "heat" as "rose" is to:
a. thorn, b. red petals, c. scent.

I have vivid dreams, disturbing my sleep.
a. often,
b. occasionally,
c. practically never.

If the odds are really against something's be-
ing a success, I still believe in taking the risk.
a. yes, b. in between, c. no.

I like it when I know so well what the group has to do that I naturally become the one in command.
a. yes, b. in between, c. no.

I would rather dress with quiet correctness than with eye-catching personal style.
a. true, b. uncertain, c. false.

An evening with a quiet hobby appeals to me more than a lively party.
a. true, b. uncertain, c. false.

I close my mind to well-meant suggestions of others, even though I know I shouldn't.
a. occasionally, b. hardly ever, c. never.

I always make it a point, in deciding anything, to refer to basic rules of right and wrong.
a. yes, b. in between, c. no.

I somewhat dislike having a group watch me at work.
a. yes, b. in between, c. no.

Because it is not always possible to get things done by gradual, reasonable methods, it is sometimes necessary to use force.
a. true, b. in between, c. false.

In school I preferred (or prefer):
a. English,
b. uncertain,
c. mathematics or arithmetic.

I have sometimes been troubled by people's saying bad things about me behind my back, with no grounds at all.
a. yes, b. uncertain, c. no.

165. Talk with ordinary, habit-bound, conventional people:
a. is often quite interesting and has a lot to it,
b. in between,
c. annoys me because it deals with trifles and lacks depth.

166. Some things make me so angry that I find it best not to speak.
a. yes, b. in between, c. no.

167. In education, it is more important to:
a. give the child enough affection,
b. in between,
c. have the child learn desirable habits and attitudes.

168. People regard me as a solid, undisturbed person, unmoved by ups and downs in circumstances.
a. yes, b. in between, c. no.

169. I think society should let reason lead it to new customs and throw aside old habits or mere traditions.
a. yes, b. in between, c. no.

170. I think it is more important in the modern world to solve:
a. the question of moral purpose,
b. uncertain,
c. the political difficulties.

171. I learn better by:
a. reading a well-written book,
b. in between,
c. joining a group discussion.

172. I like to go my own way instead of acting on approved rules.
a. true, b. uncertain, c. false.

173. I like to wait till I am sure that what I am saying is correct, before I put forth an argument.
a. always,
b. generally,
c. only if it's practicable.

174. Small things sometimes "get on my nerves" unbearably, though I realize they are trivial.
a. yes, b. in between, c. no.

175. I don't often say things on the spur of the moment that I greatly regret.
a. true, b. uncertain, c. false.

(End, column 7 on answer sheet.)

176. If asked to work with a charity drive, I would
a. accept,
b. uncertain,
c. politely say I'm too busy.

177. Which of the following words does not belong with the others?
a. wide, b. zigzag, c. straight.

178. "Soon" is to "never" as "near" is to:
a. nowhere, b. far, c. away.

179. If I make an awkward social mistake, I can soon forget it.
a. yes, b. in between, c. no.

180. I am known as an "idea man" who almost always puts forward some ideas on a problem.
a. yes, b. in between, c. no.

181. I think I am better at showing:
a. nerve in meeting challenges,
b. uncertain,
c. tolerance of other people's wishes.

182. I am considered a very enthusiastic person.
a. yes, b. in between, c. no.

183. I like a job that offers change, variety, and travel, even if it involves some danger.
a. yes, b. in between, c. no.

184. I am a fairly strict person, insisting on always doing things as correctly as possible.
a. true, b. in between, c. false.

185. I enjoy work that requires conscientious, exacting skills.
a. yes, b. in between, c. no.

186. I'm the energetic type who keeps busy.
a. yes, b. uncertain, c. no.

187. I am sure there are no questions that I have skipped or failed to answer properly.
a. yes, b. uncertain, c. no.

(End of test.)

NAME _____ SEX _____ AGE _____ DATE _____ ★

First Middle Last (Write M or F) (Nearest Year)

EXAMPLES: 1 2 3 4

RAW SCORE

A B C E F G H I L M N O Q_1 Q_2 Q_3

END OF TEST

Appendix E

SOCIAL CLASS

Rate according to father's profession. If retired, rate according to what employment used to be. If widowed or divorced rate according to what father used to do.

CLASS 1: Traditional aristocracy, millionaires, cabinet ministers, chancellors and principals of Universities, managing directors or chairmen of boards of nation wide or international companies.

CLASS 11: Professionals, salaried executives, owners of large firms, operators of moderate sized enterprizes, students of universities and colleges, prosperous farmers and landowners.

CLASS 111: Small businessmen, small farmers, clerical workers, white-collar workers, semi-professionals.

CLASS 1V: Skilled workers, qualified tradesmen, apprecentices.

CLASS V: Semi-skilled workers.

CLASS V1: Unskilled workers, permanently unemployed, poor whites.