THE ROLE OF PERSONALITY IN MIGRAINE CAUSATION

Dissertation for the Degree of Ph. D.
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DAVID MORRIS SCHNARCH
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ABSTRACT

THE ROLE OF PERSONALITY IN MIGRAINE CAUSATION

By

David Morris Schnarch

Since the early 1930's and the publication of Freud's initial theories of the unconscious, conversion symptoms, and psychosomatics; two predominant schools of thought have developed in regard to the causation of migraine headache. The constitutional model suggests that migraine results from autonomic nervous system activity which exceeds the vascular hypersensitivity of genetically predisposed people. The psychodynamic model suggests that the unconscious produces migraine as a way of coping with internal or interpersonal crisis. More specifically, psychoanalytically-oriented authors suggest that migraine results from chronic repression of anger.

Over the years, a considerable number of reports of particular personality traits of migrainous psychotherapy patients accumulated, which loosely tended to support a 'migrainous personality' profile. However, a recent review of the literature revealed that existing research was equivocal in regard to the two predominant

theories of causation. Serious methodological problems and outright conflicts in reported results made it impossible to evaluate the utility of either theory in accounting for available information on the role of personality in migraine causation (Schnarch, 1974).

The present study was undertaken to systematically evaluate reports of particular personality traits in migrainous people, and in particular, the psychoanalytic model of migraine causation. Considerable attention was devoted to avoiding the methodological problems of previous research. The "Clinical Treatment Fallacy," wherein results based on migrainous psychotherapy patients were often generalizied into causal inferences for all migraine sufferers, was given particular consideration. The present study was designed to assess personality characteristics of non-patient migraine sufferers. Extensive control groups were included in the experimental design.

Based on psychodynamic models of migraine causation and previous reports of personality dynamics in the literature, several objectives were developed for the present study. The first objective was to verify previous reports of personality traits of migrainous people. The following traits were examined:

fears of expressing anger	trait anxiety
negative afterthoughts	self-concept
awareness of anger	parental attachment

expression of anger
resentment of other people
suspicion of other people
rigidity of lifestyle
acceptance of premarital sexuality
parental disciplinary styles
sexual experience
dating experience
self-revelation
work endurance

Multiple sub-scales for several of these traits were used to permit close examination of personality characteristics. A total of 30 personality scales were used in the present study.

The second objective was to examine the psychoanalytic model of migraine causation. Three hypotheses were developed and explored in the present study:

I. Migrainous people repress more anger than non-migrainous people. Specifically, it was hypothesized that migrainous Ss would express less anger and report lower awareness of being angered by frustrating events. Moreover, migrainous Ss would report more traits indicative of underlying repression.

II. Migrainous Ss would report more personality traits that would predispose them to anger than non-migrainous Ss.

III. Migrainous Ss would report more traits that could weaken the adequacy of repressive defenses (i.e.: pre-genital fixations) than non-migrainous Ss.

A total of 5,253 undergraduate students living on campus at Michigan State University during Spring term, 1975, were contacted by mail and asked to complete a brief questionnaire. This questionnaire was similar to the one developed by Waters (1969) and allowed Ss to be diagnosed for the type and severity of headaches they experienced. Of the 3616 Ss (68.8%) returning the diagnostic questionnaire, 3200 Ss were recontacted and asked to complete a lengthy personality questionnaire. Responses were obtained from 2306 Ss (72.0%). Control group data on the diagnostic questionnaire were obtained from an additional 293 New York University students, 1293 adults at a local shopping center, 26 patients at a Community Mental Health Center, and 55 student patients at the Michigan State University Counseling Center.

Preliminary findings regarding instrument characteristics and epidemiological incidence of migraine in selected and non-selected populations are presented. Instruments were found to have good psychometric characteristics. Results indicating differences in migraine incidence, severity of headache, and referral for headache treatment

between patient and non-patient populations tended to confirm concerns of sample selection bias in previous research.

Overall, results fail to support previous reports of specific personality traits among migrainous people. No significant differences between migrainous and non-migrainous people were found on any of the personality traits listed above, save for two. Migrainous people were found to be significantly more suspicious and more fearful of expressing anger than non-migrainous people. However, these differences were actually quite small in an absolute sense. Group mean profiles were observed to be virtually identical on all remaining personality traits. Additional findings regarding personality differences between severe and non-severe headache sufferers and between male and female headache sufferers are presented.

In view of the lack of consistent personality differences between migrainous and non-migrainous people, the present study offers little support for psychodynamic models of migraine causation. Moreover, it offers no support for the suggestion that repression of anger causes migraine. The disparity of the present results with previous reports is reconciled by consideration of the pervasive methodological flaws in earlier investigations. Some support for the constitutional model is evident in personality traits found to

distinguish migraine sufferers who have high and low frequency of attacks. Implications of the present results for migraine treatment are considered.

THE ROLE OF PERSONALITY

IN

MIGRAINE CAUSATION

By

David Morris Schnarch

A DISSERTATION

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DAVID MORRIS SCHNARCH

1976

DEDICATION

To my parents, Stanley and Rose Schnarch.

As we each have found more of ourselves in the last few years, we seem to have found more of each other.

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CHAPTER ONE

INTRODUCTION

Migraine is usually defined as an episodic disturbance of cerebral functioning associated with incapacitating unilateral headache. Although headpain is the most prominent feature, diagnosis is based on the occurrence of several of the following symptoms: a sense of 'warning' of impending attacks (prodromes), such as nausea and vomiting, or extreme visual sensitivity to light immediately preceding attacks; headache is recurrent, throbbing, and usually unilateral at onset; vertigo, tremors, sweating, dryness of the mouth, pallor of the skin, and chills during the attack; relatively perfect health between attacks (Schnarch, 1974).

Although the physiological events which comprise the migraine attack have been clearly defined (Dubois-Reymond, 1860; Lennox and von Storch, 1935; O'Sullivan, 1936; Graham and Wolff, 1938; Kimball, Friedman and Vallejo, 1960; Anthony, Hinterberger and Lance, 1967; Lance, Anthony and Gonski, 1967; Lance, Anthony and Hinterberger, 1967; Lance, 1969; Wolff, 1972; etc.), the psychological aspects of migraine causation remain largely a mystery.

A review of the research literature, which attempted to critically evaluate the role of diverse factors in migraine etiology was recently completed (Schnarch, 1974). This review covered such areas as incidence and duration of attack, age of onset, sex differences, E.E.G. abnormalities, and epilepsy. Reports of stress reactions, conditioning, and personality and case history studies were also considered in depth.

Overall, the research literature on migraine was notable in its inability to critically evaluate the predominant conceptual models of migraine causation: the psychoanalytic model and the constitutional model. In areas where reports were highly consistent, such as duration and frequency of attack, available data offered little discrimination between theoretical models. Both theories were consistent with the data.

Perhaps the most important finding of this review was in regard to the personality and case history studies. Inconclusive reports and outright conflicts between reported results made it difficult to evaluate the role of personality in migraine causation. Moreover, the extent to which these studies were subject to serious methodological flaws made this task veritably impossible. This finding was of considerable import, inasmuch as these were the studies which spawned the psychoanalytic model of migraine causation. This

review produced the conclusion that basic research must be undertaken to establish the actual personality characteristics of migraine sufferers (Schnarch, 1974). Until these basic parameters are established by methodologically sound research, there is little value in further attempts to establish a causal link between personality and migraine causation.

Problems of Methodology in Past Research

Because the results and methodological problems of the existing personality studies of migrainous individuals have been reported elsewhere by the present author (Schnarch, 1974), they will not be repeated here. However, inasmuch as the methodological flaws are of interest at present, the more common problems will be summarized here.

One all-too-common problem of previous research was the failure to include multiple interviewers in case history studies. This would have reduced the potential for observer biases affecting the outcome of the studies. Since the authors did not distinguish between their observations and their theoretical conclusions, it is probable that their conceptual biases determined which portion of

the case history would be considered "significant" and which portion would be ignored. Moreover, since the interviewer was not double-blind, his behavior may have evoked, rather than "uncovered," certain personality traits in migraine patients. Similarly, even if the interviewer's behavior could have been proven to be uncorrelated with the client's migraine status, his interpretation of the behavior and free-associations of migrainous people may have been biased by prior hypotheses about migraine, per se.

Most of the support for the psychoanalytic formulation was derived from the trait interpretations and trait-based inferences of the investigator, and not from primary observation itself. Unrecorded psychotherapy and interview sessions do not permit the reader to examine the data for himself. Moreover, many investigators used migraine as a vehicle to validate some of their firm beliefs about the nature of psychopathology (ex: Fromm-Reichmann, 1937; Furmanski, 1952). From the amorphous data of long case histories and free-associations in therapy sessions, these investigators could always find some pieces to support their contention, but this might have been equally true for any other hypothesis they started out with.

A second pervasive methodological flaw was the failure to include control groups in the research design. This shortcoming was common to previous research (Touraine and Draper, 1934; Weber, 1932;

Wolff, 1937; Fromm-Reichmann, 1937; Furmanski, 1952; Knopf, 1935; Sperling, 1952). Often, the patient's behavior was interpreted to indicate personality traits supportive of the psychoanalytic model. While the investigator often provided a rationalization for finding these traits in migrainous people, no attempt was ever made to show that these traits were found any more frequently in migrainous individuals than in nonmigrainous people. Thus, no evidence was offered that these traits were causal of migraine.

The lack of control group data presented problems in other aspects. Judgments of restricted sexual functioning, basic to the psychoanalytic suggestion of infantile fixations, seemed to be made with a theoretical model of mental health in mind, rather than a group of randomly selected individuals. Thus, reports of restricted sexuality were totally dependent upon the individual investigator's conceptualization of "complete psychosexual development." Although there was considerable variance between reports (which made it difficult to evaluate theoretical models of causation), the areas of agreement that did exist may be solely attributable to mutual agreement on psychoanalytic principles.

It should be noted that even the most basic research on migraine is riddled with methodological flaws. The problem of Ss is a major case in point. Invariably, previous research always drew Ss

from the group of migraine sufferers who sought pharmacotherapy or psychotherapy.

However, in sampling an entire community, Waters (1970) found that almost 50 per cent of the people who qualified for the clinical diagnosis of migraine had never sought medical attention for their headaches. Sperling (1952) pointed out that headache is sometimes a necessary part of a working solution to an emotional problem. Moreover, poor people often do not seek treatment or are misdiagnosed at hospital clinics. These reports suggest that significant selection biases are so large that research findings based on migraine patients may not be applicable to migraine sufferers in general.

Thus, previous research must be considered in light of the "Clinical Treatment Fallacy." The clinical treatment fallacy occurs when psychotherapists attempt to make causal inferences into the etiology of a type of psychopathology in all people who have the disorder by extrapolating from their treatment experiences with their particular clients.

The concern for the clinical treatment fallacy is ramified by the recent finding that migraine sufferers undergoing treatment in a clinic were more neurotic than migraine sufferers indentified at random in the general population (Henryk-Gutt and Rees, 1973). Moreover, there are other indications that self-selection factors exist,

both for people who do not seek treatment (and are systematically excluded from migraine research) and for people who remain in treatment (and make up the pool of research Ss):

> It is a constant source of amazement to me why so many patients to whom we can not supply specific and prompt relief keep coming back to the same doctor. Why, after 8, 10, 12, 15, 20, a hundred visits; and they still have their headaches, do they keep coming back? They keep coming back because you help them to handle their symptom and not because you cure them; and this same group of patients might be very worse off if you ever did cure them. (p. 11, Garner, Shulman, MacNeal and Diamond, 1967)

Some recent research in the area of essential hypertension highlights the problem of the clinical treatment fallacy in formulations of other psychosomatic disorders. Kidson (1973) conducted a study in which he compared personality traits of 40 hypertension patients with those of 110 hypertensive non-patients. The latter group of Ss were randomly selected from 1000 industrial and scientific employees, who were diagnosed by medical examination. Hypertension patients were found to be more neurotic, more insecure, and more tense than non-patients when responses to the Cattel 16PF Questionnaire were compared.

Previously, Robinson (1964) had suggested that diagnostic procedures led to high neurotic hypertensives having a greater likelihood of being discovered than less neurotic individuals with

equally high blood pressure. This was subsequently confirmed by Cochrane (1969).

Cochrane (1973) conducted a similar study to Kidson's (1973). Cochrane's study tested Alexander's formulation (1939) that hypertension resulted from chronic inhibition of anger. According to Alexander's theory, essential hypertensive people repress and inwardly direct their hostility more than normotensive people do, thus causing their hypertension. Moreover, Cochrane examined Sainsbury's report (1960) that people suffering from psychosomatic disorders were generally more neurotic than people without psychosomatic disorders. Cochrane (1973) found no evidence that essential hypertension was related to emotional instability or traits of hostility, when non-patient hypertensive and normotensive Ss were compared. Extensive control group and matching procedures were used in this study, and results were quite clearly defined.

The studies by Kidson (1973) and Cochrane (1973) are of interest to the present discussion insofar as the clinical treatment fallacy seems involved in the etiological models of psychosomatic disorders aside from migraine. Moreover, it is interesting to note that while essential hypertension and migraine have been suggested to result from similar dynamics (i.e. repression of anger), these studies failed to confirm this in the former disorder.

Clearly, there is reason to suspect that trait reports of migrainous psychotherapy patients cannot be generalized into causal inferences for all migraine sufferers. Yet, to date, the predominant theories of the role of personality in migraine causation have evolved from research based on the clinical treatment fallacy.

The problems of Ss selection bias permeate even such basic research areas as rate of incidence. Moreover, data on other basic parameters, such as age of onset, is also questionable. Consider that onset does not necessarily refer to the first attack. Rather, data on 'onset' probably reflects the beginning of chronic and/or severe headaches that demand medical attention. Individuals with mild or infrequent migraine attacks may never seek treatment.

Clearly, not all migraine sufferers are migraine patients. Yet, when the role of personality in migraine etiology is at question, it is just as important to include the traits of these individuals in our sample with those of the more chronic or severe migraine sufferers. With the basic parameters in question, it is not surprising that complex entitites, such as personality traits, are not clearly established.

Overview of the Present Study

There has long been a controversy raging over the cause of migraine headaches. Two theories have generally developed: a constitutional model and a psychodynamic model.

The constitutional model is based on the assumption that migraine susceptibility arises from genetically transmitted hypersensitivity of the cranial arteries to fluctuations of serotonin level in the blood stream. Specific attacks are assumed to occur when any strong emotional reaction or physiological change evokes sufficient variations in serotonin level. The unique personality structure of each individual is suggested to determine the situations that are capable of triggering migraine attacks. Particular feelings or personality traits of migrainous people are not predicted by the constitutional model. However, stronger affects such as rage or massive anxiety are considered more likely to generate the sympathetic nervous system activity that creates relatively large deviations in serotonin level.

The predominant psychodynamic theory is that originally put forward by Fromm-Reichmann (1937). She started with the assumption that the unconscious has the power to inflict physiological damage as a self-punishment for hostile impulses toward sacred loved ones.

She then derived from psychoanalysis a specific etiology for such massive repression which seemed to fit her patients. Although subsequent writers have quarreled with many of her assumptions, the central importance of repressed anger has been the dominant theme of all the psychodynamic theories.

Each psychodynamic theory of migraine has two parts. All psychodynamic theories assume that migraine headaches are produced by the unconscious as a way of coping with a personality crisis. The various theories differ from one another in their explanation of what personality traits contribute to the creation of the crisis.

The constitutional and the psychodynamic theories of migraine are not mutually exclusive. Many of the constitutional theorists have argued that the specific trigger for an attack of migraine might be an extreme emotional reaction. Thus, among those who are unfortunate enough to have inherited migraine potentiality, there might be a correlation between personality stress and frequency of attacks.

The present study provides a preliminary test of the psychodynamic models by presenting data concerning the personality differences between migrainous and non-migrainous people. To date, it is the first adequately controlled and methodologically sound examination of its kind. In the remainder of this introductory section the results of previous studies examining the personality traits of

migrainous people will be reported. It should be mentioned that some of the authors to be cited conceptualized their own results within the constitutional model. Two examples of such authors are Touraine and Draper (1934) and Wolff (1937). However, in these and other cases, their trait profile reports were almost identical to reports from psychoanalytically-oriented writers. Moreover, their results are both relevant and consonant with the psychoanalytic model. Constitutionally-oriented authors will be footnoted when their results are discussed. However, the reader is again referred elsewhere (Schnarch, 1974) for a complete analysis and discussion of the intricacies of theory and research that will be outlined here.

A summary of the trait reports of previous investigators is presented in Table 1. Table 1 also contains a brief indication of the methodological problems specific to each study. In the following pages, these trait reports will be integrated into the common psychodynamic model of migraine causation. Moreover, the methodological flaws that challenge the validity of these reports will be considered in detail.

TABLE ONE

PREVIOUSLY REPORTED TRAITS OF MIGRAINOUS PEOPLE

AUTHOR	PERSONALITY TRAITS: Sample size	Repressed hostility Anger not expressed	Rigid Superego	Intolerant of Frustration	Perfectionistic	Pregenital fixation	Sexually maladjusted	Unresolved parental attachment	Poor interpersonal relationships	Overwork, strong achievement drive	Resentful	Rigid, inflexible	ADDITIONAL TRAITS	AUTHOR	METHODOLOGICAL PROBLEMS: Small sample size	No control group	No inter-rater reliability	No statistical analysis	Inaccurate statistical analysis	Inaccurate measurement Instrument	Sample Selection Bias
Weber (1934)	1	X		X			X	X					low self-confidence	Weber (1934)	X	X	X	X			X
Touraine & Draper (1934)	50				X	X	X	X		X			avoidance of dependency	Touraine & Draper (1934)	X	X	X	X			X
Knopf (1935)	30	X		X			X	X	X	X	X		chronically tense; over-sensitive; domineering	Knopf (1935)	X	X	X	X			X
Fromm-Reichmann (1937)	8	X	X		X				X	X	X		unresolved ambivalence toward 'beloved' persons inferiority feelings; competitive; family background encourages repression	Fromm-Reichmann (1937)	X	X	X	X			X
Wolff (1937)	46	X	X	X	X		X		X	X	X	X	desire dependency; competitive; 'normal childhood'; difficulty allocating responsibility	Wolff (1937)	X	X	X	X			X
Ross & McNaughton (1945)	200			X	X		X			X		X	over-conventional; non-neurotic	Ross & McNaughton (1945)			X		X		X
Marcussen & Wolff (1949)	20	X	X	X	X				X	X	X	X	chronically tense; non-neurotic; crave praise; insecure	Marcussen & Wolf (1945)	X	X	X	X			X
Alexander (1950)	A	X												Alexander (1950)	?	X	X	X			X
Furmanski (1952)	100	X	X	X	X	X	X		X	X	X	X	prone to extreme anger reactions; chronically tense; crave praise	Furmanski (1952)		X	X	X			X
Sperling (1952)	23	X	X	X		X	X	X	X		X	X	exaggerated independence; domineering	Sperling (1952)	X	X	X	X			X
Garner, Shulman MacNeil & Diamond (1967)	A	X											intense rage, compulsive personality	Garner, Shulman MacNeil & Diamond (1967)	?	X	X	X			X
Bihldorf, King & Parnes (1971)	101	X	X										compulsive personality	Bihldorf, King & Parnes (1971)					X	X	X
Henryk-Gutt & (Rees (1973)	1859												male Ss report more hostile behavior	Henryk-Gutt & Rees (1973)						X	

[A] Note: no sample size reported.

Previously Reported Personality Traits of Migraine Patients

Primary Traits: Repression of Anger

The psychodynamic model suggests that susceptibility to migraine results from particular personality dynamics. That is, people who tend to translate hostile impulses into self-punishment suffer migraines. It has been widely reported that migraine results from the activity of intra-psychic defense mechanisms (i.e. repression) directed against the experience and expression of hostile feelings (Weber, 1932; Fromm-Reichmann, 1937; Alexander, 1950; Furmanski, 1952; Sperling, 1952; Garner, Shulman, MacNeal and Diamond, 1967; Bihldorf, King and Parnes, 1971).

Weber (1932) reported that migraine attacks were caused by repressed feelings of rage. Fromm-Reichmann (1937) reported migrainous people ".... could not stand being aware of their hostility against consciously-beloved persons; therefore, they conconsciously tried to keep their hostility repressed and finally expressed it by the physical symptom of migraines" (1937, p. 26).

During a national symposium on the psychiatric aspects of headache, Garner (et al., 1967) presented a summation of his extensive experiences in treating severe headache:

> The crucial factor for migraine, I am inclined to believe, is intense rage and the accompanying cerebrovascular reaction of the rage emotion. It is a rage that is not spent in an explosion of verbalizations of what is on the patient's mind or in behavior (1967, p. 2).

Dr. Garner's co-speakers at the symposium echoed the report that migraine patients repress their anger and thus cause their attacks:

> Hostility will create a headache only when, as Dr. Garner and Dr. Shulman have said, it can not be adequately expressed. There are various directions in which it is not permissible for us to express our hostility, and these are just the areas in which it most commonly occurs. The hostility which produces this headache is due to hostility directed at siblings, directed at our parents, directed at our boss, directed at our spouses, directed at ourselves and directed at our God (MacNeal, in Garner et al., 1967).

However, there is very little concrete clinical research which indicates that migrainous people repress their anger more than non-migrainous people do. Furmanski (1952) reported that 93 per cent of the patients in his study could not express their anger. However, no control group data was collected.

In a related area, a physiologically-oriented study was conducted several years ago (Oken, et al., 1962), attempting to explore the central idea of psychoanalytic theory with regard to psychosomatics, which states that ". . . an emotion which is dammed up and fails to be 'discharged' leads to physiological alterations which

eventuate in tissue pathology" (1962, p. 336). These investigators developed an elaborate and imaginative methodology of personally stressful and threatening situations for Ss to test the hypothesis that physiological activation during psychological stress would be greater in Ss who displayed little outward expression of emotion, as compared to Ss who freely discharged their feelings.

In analyzing the results from 18 "normal" college students, the authors found that limitation of overt affective expression was generally not associated with heightened physiological responses. However, three independent measures of vascular tone (diastolic blood pressure, finger blood flow, and finger skin temperature) did show non-statistically significant trends toward increases in activity.

Of course, there is some difficulty in interpreting these results with respect to migraine and affect expression. First, results were non-statistically significant, although the authors were impressed with the fact that the measures of vascular tone showed independent but similar trends. Second, Ss were 'normals' and did not have migraine. Third, the physiological responses were linked to suppression of feelings in general, not specifically to repression of anger. Fourth, the authors point out that their research indicated nothing about specific localized physiological responses,

such as arterial blood flow. Thus, while the authors took the liberty of suggesting some tentative support for the notion that essential hypertension is caused by suppression of feelings (presumably because hyptertension involves global blood pressure increases), their findings are not applicable to the local cranial arterial changes that occur in migraine.[1] The vehicle of physiological research has not produced other studies to date which demonstrate a link between repression of anger with vascular changes in migrainous people.

To date, the research on the role of anger and repression in migraine etiology has gone through several evolutionary periods. Preliminary studies consisted of the clinical reports examined above. In recent years, a new phase of research has begun, typified by control groups and psychometric tests. Its antecedents lie in a study conducted by Ross and McNaughton (1945) which examined the responses of 50 migraine patients on the Rorschach test. The standardized Klopfer scoring system was used to compare their responses with those of non-migrainous headache sufferers, brain-damaged Ss, neurotic Ss receiving treatment at a local hospital, and a group of

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[1] On the other hand, the reader may wish to consider that monitoring finger temperature, one of the variables found to be positively correlated with suppression of feelings, is one of the most productive methods of teaching migraine sufferers to control their attacks via bio-feedback.

'normal' friends of the investigators. Although the authors attended to the need for control groups, they were not able to anticipate the concern for sample selection bias which was to arise 25 years later. Their populations were highly atypical with regard to high intelligence and social status.

Ross and McNaughton (1945) did not report any data suggestive of repressed hostility in migrainous patients. However, these investigators did report indications of other secondary traits. Ross and McNaughton reported that migrainous patients characteristically displayed excessive delay in responding to card VI (the 'sex stimulus' card), usually gave more than 75 percent "W" responses, tended to view the card upright without rotation, and generally gave only one response per card. From this data, the authors concluded that migrainous patients were perfectionistic, inflexible, over-conventional, intolerant, persistent toward success, and sexually maladjusted. However, they also concluded that migrainous patients did not appear particularly "neurotic."

Aside from the problem of sample selection bias, flaws in the statistical analysis tended to discount the reports of secondary personality traits in this study. The authors considered only the findings showing statistically significant results and ignored the data on equivalent measures that were not significant. This procedure

capitalized on chance outcome from multiple significance testing. Moreover, the control groups were not actually used for comparison purposes. Migrainous and brain-damaged patients gave almost identical group profiles on three of the four variables showing significant differences from the other groups, but only the responses of the migraine group were interpreted as indicating rigidity, inflexibility and perfectionism! In the final analysis, Ross and McNaughton interpreted the meaning of their empirical findings in light of previous reports of 'migrainous' personality characteristics rather than from a comparative examination of group profiles.

One of the first adequately controlled studies addressing migrainous people's styles of coping with anger was recently completed. Bihldorf, King and Parnes (1971) conducted a questionnaire study of 33 migraine patients. Forty-one tension headache patients and 27 people who had no headache in the last year were used as controls. The authors reported their results indicated that migraine and tension headache sufferers had unique patterns of anger responses that differentiated the two headache groups from each other. Moreover, both headache groups were significantly different from the no-headache group with regard to handling anger. Migraine patients were reported to be highly inhibited, and repressed their anger from consciousness. Tension headache patients who were reported to express

more anger than the other two groups, and were more guilty and depressed.

However, serious methodological flaws tend to discredit these reports. For one, the authors conducted over 259 repeated tests for significance without regard for chance outcome in the data. Another shortcoming was the authors' failure to analyze conflicting patterns of results. Often, Bihldorf et al. (1971) obtained results wherein two very similar questionnaire items yielded different results. The authors never attempted to organize their questionnaire into content clusters, and thus failed to examine discrepancies in their data. Both shortcomings tended to maximize the effects of random error in the data.

A third shortcoming in the study by Bihldorf et al. (1971) was the misinterpretation of the statistical tests that were conducted. The authors used chi-square analysis to analyze group differences in report of experiencing anger. They concluded that a statistically significant chi-square indicated that migraine patients were significantly more angry than the other two groups. However, the real differences were between the headache patients and the people with no headache. Both migraine and tension headache patients reported more anger than the non-headache group, although they did not differ from each other.

In summary, the conclusions of Bihldorf, King and Parnes (1971) seem unfounded. Re-evaluation of their data suggests that the major differences in expressing anger occur between people who have headache and people who don't. Migraine patients failed to display unique characteristics in repressing. Moreover, the authors' own conclusions capitalized on chance outcome of the data.

However, this study highlights the importance of using relevant control groups. The work of Bihldorf et al. (1971) suggests that a questionnaire can be an important research tool in the area of migraine, if substantive methodological procedures in instrument development and data analysis are adopted.

Another study belonging to this new phase of research was recently completed by Henryk-Gutt and Rees (1973). In order to avoid problems of Ss selection bias, this research utilized a diagnostic questionnaire to identify migraine sufferers among 1,859 workers at two government agencies in England. Four basic groups of 50 Ss each were selected: classic migraine sufferers (migraine with prodromal symptoms, unilateral headache, and nausea or vomiting); common migraine sufferers (headache with none of the three symptoms of migraine) and headache-free people (having two or fewer headaches per year, with no symptoms of migraine). Subjects in the first three headache groups were matched with regard to frequency of headache. The latter three

groups (common migraine, tension headache, and no headache) served as controls in the study.

Among other facets of the research, these investigators utilized the Buss-Durkey Hostility Inventory (1957) to assess prior reports that migrainous individuals exhibit particular difficulties in dealing with and expressing hostility and aggression. In analyzing the results, responses to the Buss-Durkey Inventory were summed into three component scores: Hostile Attitude, Hostile Behavior, and Guilt. The investigators reported that male classic migraine sufferers reported significantly more hostile behavior than the no-headache control group. No differences between the male classic migraine sufferers and the other male control groups were found. Moreover, no differences were found between any of the relevant female sub-groups, and no differences were found to exist between any of the male or female subgroups with regard to the guilt score.

It is highly likely that the above cited results were an artifact of the Buss-Durkee Inventory itself. In compiling a 'hostile behavior' sub-score, the authors combined responses to the assault, indirect hostility, verbal hostility and irritability subscales of the Buss-Durkee Inventory. However, each of these subscales is non-homogeneous with regard to the dimension it purports to measure. For example, the Assaultive Behavior subscale contains

items which relate to a wide diversity of areas other than assaultive behavior. These other areas include beliefs and values (without regard to specific behaviors), temperament, assessment of oneself in comparison to unspecified reference groups, and unspecific questions involving variable interpretations and cultural standards (e.g.: "I get into fights about as often as the next person"). Thus, if the cluster most directly aimed at measuring physical assault actually measures many other extraneous variables, then a summation of items from other clusters which clearly do not measure hostile behavior (e.g. "I am irritated a great deal more than other people are aware of") can hardly be a reliable and valid measure of hostile behavior. In essence, the Buss-Durkee Hostility Inventory measures many other dimensions than simply the expression of hostility, and as constructed, it does not seem to be a suitable vehicle for the examination of hostile expression in the etiology of migraine. In light of this, it is difficult to interpret the findings of Henryk-Gutt and Rees (1973) with regard to the expression of anger by migrainous men.

In reviewing the above cited research, Bakal (1975) reached the conclusion that "the inconsistency of these findings certainly detracts from the clinical conviction of a definite migrainous personality" (p. 375). Bakal (1975) went on to suggest initiating a new phase of research, whose strategy avoids trait and personality

dynamics, per se, and focuses instead on situational variables and headache sufferers' migraine-producing reactions to them. Although it is premature to abandon a 'personality framework' in conducting future research, it is evident that the second, "empirical," phase of migraine research has been methodologically superior to the early clinical studies, but no more productive. In essence, the studies of Bihldorf et al. (1971) and Henryk-Gutt and Rees (1973) are subject to new methodological problems: poorly developed measurement instruments, poor data analysis, and a total failure to critically address their results (especially inconsistencies) to migraine personality theory.

Secondary Traits

Do migrainous people actually express less of their anger than do non-migrainous people? Are migrainous people more afraid to show their anger? The present study will attempt to answer these questions.

In general, the tendency to repress anger is the most frequently reported personality trait of migraine patients. Moreover, it is the basic causal element hypothesized by the psychoanalytic model. However, other personality characteristics of migraine

patients have been reported with some regularity. Inasmuch as these reports of personality traits are presented in the nature of "migraine patients are thus and so," rather than "thus and so causes migraine," the literature on additional personality traits is not well integrated with respect to causal aspects of personality in migraine etiology. In the following pages, these will be considered "secondary traits" insofar as they (1) predispose the individual to feelings of anger, (2) result from the repression of anger, or (3) effect the repressive defenses of the individual. Secondary traits relevant to the predisposition to anger will be considered first.

Thus far, reports have suggested that migraine patients repress their anger. The next logical question is: Do these people have more anger to repress than non-migrainous people? Furmanski (1952) reported that migraine patients are particularly intolerant to frustration of impulse gratification. He felt his patients were highly prone to extreme anger reactions. Furmanski suggested this developed from denial of gratification, lack of parental affection, and strict child-rearing practices during the early years of life. The report that migraine patients have low frustration tolerance and are easily provoked to anger is echoed by other writers (Knopf, 1935; Friedman and von Storch, 1951; Sperling, 1952).

These reports suggest that migrainous people are, in fact, more angry as they go through their daily lives than non-migrainous people. However, there is no control group data to accompany any of the above reports. If it is true that migrainous people are relatively quick to anger and are predisposed to repress that anger (and if it is true that repression causes migraine), then it would seem that migrainous people are characterlogically predisposed to repetitive migraine attacks. If the above pattern could be proven, it would tend to support the psychoanalytic model of migraine causation.

On a related level, it has been reported that migraine patients are inflexible and perfectionistic. Frumanski (1952) reported that migraine patients were notable in their highly developed striving for perfection in their lives.

Wolff (1937)[1] judged his migraine patients to be quite inflexible, often becoming upset when forced to operate in disorder or hurried circumstances. The patients Wolff observed had difficulty allocating responsibility to others, and often preferred to do tasks themselves rather than risk being disappointed. Marcussen and Wolff (1949) reported that migraine patients often devoted their lives to

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[1]Wolff (1937) and Touraine and Draper (1934) interpreted their own data within the framework of the constitutional model.

striving for perfection in their work. Touraine and Draper (1934)[1] also reported migraine patients to be highly perfectionistic.

The reports of rigidity in coping style and extreme perfectionism are relevant to the psychoanalytic model as they represent additional predisposition to experiencing frustration and anger in daily life. However, without control group data, it is difficult to assess the validity of these previous reports. If they are true, then it is anticipated that migrainous people will display more rigidity in life style and more work endurance than non-migrainous people in the present study.

Other reports of personality characteristics suggest that migraine patients are chronically tense and worrisome. Knopf (1935) and Marcussen and Wolff (1949) observed these traits in the migraine patients they interviewed. Furmanski (1952) reported that anxiety reactions were the most common neurosis diagnosed in his patients (35 per cent). These reports are consistent with the notion that quests for personal perfection and unreachable standards may generate considerable tension and anxiety. Moreover, these reports are consonant with a more psychodynamic rationale. Because they repress more life experiences to a greater degree, migrainous people are more likely to encounter situations that evoke feelings which are related to

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[1] Ibid.

repressed material. When the repressed feelings or their derivatives are encountered, anxiety is experienced.

Thus, past reports suggest that migrainous individuals are predisposed to perceive objectively non-dangerous circumstances as threatening and anxiety-provoking. This predisposition is equivalent to the characteristic of high trait-anxiety (Spielberger, 1961). However, it remains to be demonstrated that migrainous people are more predisposed to anxiety than non-migrainous people.

It has been reported that migraine patients are resentful and embittered in their outlook on life. Marcussen and Wolff (1949) suggested that these traits stem from the migraine patient's inability to satisfy unrealistic self-expectations. In a similar vein, Fromm-Reichmann (1937) reported that in migraine patients, perpetual failure to achieve perfectionistic goals gave rise to feelings of frustration, inferiority, and inadequacy, that were undiminished by more moderate, realistic accomplishments. Wolff (1937)[1] judged two-thirds of his 46 migraine patients to be holding lasting resentments and unable to forgive or accept the shortcomings of other people.

The above traits are relevant to the psychoanalytic model in so far as they predispose an individual to feelings of anger.

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[1]Wolff (1937) interpreted his own results within the framework of the constitutional model.

Individuals who are chronically tense and worrisome may be particularly provoked by everyday frustrations. If these same individuals are rigid and inflexible in their approach to life, they will probably encounter such frustrations at every turn. Moreover, it probably takes very little stimulus to trigger anger in people who are resentful and embittered to begin with. People with these traits are more likely to get angry than those people who don't.

Moreover, the above traits can also be interpreted as by-products of repressive defenses. Considerable free-floating anxiety can be engendered by extensive repression of commonly encountered feelings. Resentment may be a derivative of repressed anger that is allowed to reach consciousness. People who repress their anger may also project their angry feelings onto others. Thus, they would be highly suspicious of personal approaches by other people. Highly suspicious people would not only be predisposed to considerable trait-anxiety, but would also tend to have poor interpersonal relationships. If these traits are actually more common among migrainous people than non-migrainous people, and if migrainous people express less anger, then the data could be interpreted as showing repression and would tend to support the psychoanalytic model.

In this vein, there are reports that migraine patients do not form or maintain meaningful and intimate interpersonal relationships.

Knopf (1935) indicated that over half of the migraine patients in her study reported poor marital relationships. Other patients reported difficulties in establishing interpersonal contacts. Furmanski (1952) reported that migraine patients failed to display "mature social feelings" in relationships with others. Although this term is open to interpretation, it appears that Furmanski was referring to a lack of intimate depth in these relationships. Wolff (1937) also offered reports along this vein.

Marcussen and Wolff (1949) interpreted their migraine patients' extreme devotion to work as evidence of difficulty in sustaining intimate relationships. These authors suggested that migraine patients feel insecure in close relationships and attempt to gain security by achieving status and recognition in their work. The authors suggest that when this fails, migraine patients attempt to achieve gratification of their needs by withdrawing even further into their work.

However, it has not been established that this behavior is more common among migrainous people. Moreover, it may be that migraine sufferers with poor interpersonal relationships self-select into treatment, where an understanding and compassionate care can be purchased. It will be informative to see if migraine sufferers are more suspicious of other people than are non-migrainous people. Also of interest will be the number of dating or intimate relationships established by Ss, as well as their comfort with self-revelation.

Within the psychoanalytic framework, the traits of inflexibility, low frustration tolerance, poor interpersonal relationships, etc., are often interpreted to indicate pregenital (anal/oral) fixations. The theoretical conflicts between reports from psychoanalytically-oriented authors in regard to psychosexual fixations (ex: Furmanski, 1952; Sperling, 1952) have been previously reported (Schnarch, 1974). However, there is some evidence in the literature to suggest that migraine patients are not fully sexually functional.

Touraine and Draper (1934)[1] reported that the migraine patients in their study were not sexually responsive. Their patients reported no pleasure from intercourse and often refused to partake. These authors noted their patients reported having no sexual curiosity during childhood or adolescence. These patients often lacked basic information on reproduction until late in adult life, and female patients were often emotionally unprepared for the onset of menstruation. Touraine and Draper considered migraine attacks to be a defense against sexual contact for some individuals.

Friedman and von Storch (1951) also reported that migraine patients often achieved minimally satisfying sexual adjustment.

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[1] Touraine and Draper (1934) interpreted their results within the constitutional model.

Knopf (1935) found that although all her patients had experienced intercourse, they had very limited previous sexual experimentation. Intercourse itself was usually experienced as a by-product of marriage. Knopf reported that 30 per cent of her patients expressed no desire for sexual contact and were presumably inorgasmic. An additional 25 per cent also were inorgasmic, but reported being interested in sex.

Although Sperling did not report on the orgasmic competency of her patients, she judged her male migraine patients to be preoccupied with oral-genital contact. However, it is not clear whether this is indicative of the sexual practices of Sperling or her patients! Furmanski (1952) judged all of his migraine patients to be fully sexually functional.

Reports of restricted sexual development are supportive of the psychoanalytic concept of pre-genital fixations. Moreover, if it is assumed that any area of conflict or anxiety heightens an individual's provocability to resentment and anger, then the reports of sexual maladjustment take on additional significance for the psychoanalytic model. Sexuality is a particularly affect-laden area for most people.

However, these reports of sexual maladjustment were made without reference to control groups, and without benefit of naive observers. It is possible that considerable rater biases were involved in

these reports. Moreover, it is possible that many individuals (particularly in the 1930's) who did not suffer migraine also might have been judged sexually maladjusted. It will be informative to see if migraine sufferers in our modern society differ in sexual adjustment from non-sufferers. In the proposed study, Ss' general history of sexual experimentation and specific reports of orgasmic competency will be compared.

The secondary personality characteristics considered thus far have been relevant to the psychoanalytic model because each would tend to predispose an individual to the experience of anger in everyday life. Within the psychoanalytic framework, the more angry a migraine sufferer is, the more he will have to repress. When impulse strength overwhelmes defense mechanism capabilities, attacks should increase in frequency or severity. Moreover, within the economic considerations, anything that tends to diminish the integrity of repressive defenses should also bring forth increased migraine attacks. Reports in the research literature present areas, aside from pregenital fixations, that are relevant to the 'psychic energy' available for repression: parental attachment and overwork.

Touraine and Draper (1934) reported that their sample of migraine patients were strongly torn between the desire to escape the influence of their mother and a desire not to leave her. The authors noted

these unresolved attachments and incomplete separations existed throughout adult life and marriage. This pattern was so outstanding, the authors suggested, that the trigger for migraine onset might be any event which threatened the balance of the parent-child dependence/ independence relationship.

Although Wolff (1949) reported that the parental attachments of migraine patients were no deeper than the typical close childhood identification with mother, there is additional data to suggest that parental attachments are particularly strong in migraine patients. A recent review of the literature indicated that the most common age of onset lies in the years of late adolescence and young adulthood, several years after onset of puberty (Schnarch, 1974). Moreover, in examining case history studies (ex: Touraine and Draper, 1934; Knopf, 1935; Sperling, 1952) onset of migraine was sometimes reported to coincide with the death of a parent. Other times, onset was associated with an impending loss of the dependency relationship with a parent.

Within the psychoanalytical model, the loss of a dependency relationship may serve to stimulate angry and resentful feelings. Moreover, it may also serve to disturb the equilibrium and organization of emotional investment and cathexis, thus weakening the operation of repressive defenses within the personality. In other words, the psychoanlytic model suggests that changes in important dependency

relationships with parents may signal the onset of attacks in much the same way that traumatic neurosis is conceptualized.

The notion that migrainous people have incomplete emotional separation from their parents is compatible with the other personality characteristics already discussed. Strong parental attachment may indicate a pre-genital fixation. Moreover, if a person's major emotional investment still resides in his parents late in his life, he will probably neither seek nor maintain intimate interpersonal relationships with peers. Similarly, sexual adjustment will be minimal, as sexual contact usually ("normally") occurs in the context of intimate peer relationships, which confront an individual with the realization of adult status. However, theoretical consistency cannot replace primary observation. It will be interesting to see if migrainous people report stronger parental attachments than do non-migrainous people in the present study.

The last secondary trait of interest is the report of work characteristics of migraine patients. The question of work endurance was briefly mentioned earlier in this section, in regard to reports that migraine patients were rigid, inflexible and perfectionistic. Fromm-Reichmann (1937) reported that her migraine patients felt competitive or resentful of the intellectual capabilities and achievement of the person who was the object of their repressed anger.

She hypothesized that her patients wanted to feel superior to these individuals, and generalized these feelings to competitive and achievement-oriented behavior in later life. As hard work was the avenue of sublimation for these feelings, work became a predominant activity in the lives of her migraine patients. It should be noted that Fromm-Reichmann's clients were highly atypical of the general population of migraine sufferers: physicians and scientists.

Furmanski (1952) also noted that work was very important to his migraine patients. He hypothesized that they attempted to gain attention during childhood by strict compliance to parental achievement demands, and generalized this into an adult life style. Moreover, Furmanksi suggested that work was important to migraine patients as a functional way to sublimate the considerable anger and frustration they stored. However, he failed to consider that only people with high work endurance can usually afford the costs of private psychiatric treatment.

Marcussen and Wolff (1949) reported their migraine patients craved the praise and rewards that came from superior work performance. They observed that migraine patients stuck rigidly to their work tasks, often ignoring their own needs for rest and relaxation in their quest for satisfaction of their perfectionistic standards. These authors suggested that this "work compulsion" resulted in the

development of chronic feelings of resentment and frustration. Moreover, when energy reserves are depleted through overwork, repressive competencies are diminished, and a migraine attack occurs. Marcussen and Wolff (1949) futher suggested that the attack has the secondary effect of making the individual withdraw from work demands, thus offering respite from a vicious cycle. It will be important to see if migraine sufferers report more work endurance than non-migrainous people, in establishing the actual personality characteristics of migraine sufferers.

Control Groups

The present study will utilize a group of tension headache sufferers for comparison purposes. Several factors make tension headache sufferers a particularly appropriate control group.

Thus far, the psychoanalytic and constitutional models have respectively proposed that personality solely, or in part, predisposes a person to have migraine as a clinical problem. However, one must consider the converse: does severe headache have a considerable impact in determining personality? Certainly, the experience of frequent incapacitating headache, regardless of its physiological

mechanism, might shape a person's outlook on life as well as his life-style. Thus, tension headache sufferers constitute a control group which can be used in part to rule out the possibility that traits observed in migraine sufferers simply result from their severe headaches, rather than vice versa.

The appropriateness of tension headache control Ss also stems from suggestions of psychoanalytic writers that migraine and tension headache both result from psychic processes, albeit different ones. That is, migraine is suggested to result from repression of anger, whereas tension headache results from suppression. Fromm-Reichman (1937) wrote:

> If we remember our well-known analytic experience that the organism is able to give unconscious utterance to repressed feelings by involuntary movements, then we understand that a patient suffering from migraine, that is from the results of unconscious spasmodic contractions of the involuntary muscular system, is unconsciously expressing his repressed hostility against a beloved person on the same principle as another would express his conscious hatred.
>
> The average person feeling conscious hatred against an adversary uses contractions of his voluntary skeletal muscles which obey conscious impulses as a normal conscious means of expressing his hostility. The migraine patient who represses his hostility against consciously beloved persons, produces as his unconscious expression of this repressed hatred spasmodic contractions of involuntary smooth muscles which obey unconscious impulses (p. 28).

Migraine is suggested to be linked to repression because the smooth muscle tissue of the arteries are involved, whereas tension

headache is linked to suppression because it results from hypertonia of the striated muscles of the face and neck. Fromm-Reichman (1937) went on to suggest:

> Although nearly every neurotic as well as the so-called healthy person may occasionally express an attack of anger or hatred which is more or less temporarily or more or less superficially repressed or even only suppressed, by producing an attack of common headache, I have the impression that migraine always seems to be one specific expression of deeply repressed continuous hostility against beloved persons, that is to say the specific expression of unresolved ambivalence (p. 29).

CHAPTER TWO

OBJECTIVES OF THE PRESENT STUDY

Objective One: Examination of Personality Traits of Migrainous People

The overall goal of the present study was to provide an empirical examination of the general plausibility of the hypothesis that migraine headache has a psychodynamic origin. One or more of the authors listed in Table One reported that migrainous Ss differ from non-migrainous Ss in having greater:

fears of expressing anger

negative afterthoughts

resentment of other people

suspicion of other people

rigidity of lifestyle

parental attachment

trait anxiety

work endurance

parental disciplinary styles encouraging repression of anger

Moreover, one or more of the authors in Table One reported that migrainous Ss differ from non-migrainous Ss in being low or lacking in:

awareness of anger

expression of anger

sexual experience and orgasmic competency

dating experience

self-revelation

Finally, the following traits were of interest, often being implied in previous reports, although not directly discussed in previous reports:

self-esteem

acceptance of premarital sexuality

The examination of these traits constituted an empirical validation or disconfirmation of each claim of previous investigators. Moreover, this list of traits contains nearly all the central traits in any psychodynamic theory of migraine causation. Therefore, any psychodynamic theory would predict significant differences on one or more of these traits.

Objective Two: Examination of Psychoanalytic Formulations of Migraine

The bulk of the psychodynamic theories have been variants of the psychoanalytic model of migraine causation, which postulates that migraine is a response to repressed anger. This study was specifically designed to test that hypothesis. The key to testing this hypothesis was to assess whether migrainous Ss had large amounts of repressed anger. Since repression cannot be directly observed, the hypothesis must be tested by looking at indirect indications of repression. If anger is being repressed, migrainous Ss should show low awareness as well as low expression of anger. However, if migrainous Ss were found to be relatively lower than non-migrainous Ss on these dimensions, that would not be sufficient evidence to infer the repression of anger. It might be argued that migrainous Ss are simply less angry. If migrainous Ss show less awareness and less expression of anger, evidence in favor of repression can be sought in two directions. First, are there antecedent conditions which would tend to suggest that migrainous Ss would be angrier or at least as angry as non-migrainous Ss? Various writers cited in Table One would have suggested that several personality traits might predispose migrainous Ss to extreme anger: perfectionism, rigidity of

lifestyle, chronic feelings of resentment, and strong parental attachments. Second, if anger has been repressed, then it should emerge in some consequent form. For example, migrainous Ss might be expected to be higher on trait anxiety, suspicion, fears of expressing anger, or negative afterthoughts after expressing anger.

Significant differences on one of the above traits would be insufficient to demonstrate repression of anger in migrainous Ss. As true of the methods of the therapist, repression of anger can only be inferred from the gestalt of several patterns or traits. That is, repression would be indicated by low awareness and expression of anger in conjunction with high disposition to anger. Another pattern indicative of repression would be low expression and awareness of anger in conjunction with indications of indirect expression of anger.

It was noted in Table One that several authors reported migrainous Ss to be pregenitally fixated. Psychoanalytically-oriented writers believed that pre-genital fixations limited the amount of anger that could be repressed, and hence, forced the individual who repressed anger into frequent or severe migraine attacks. These authors would predict that migrainous Ss tend to display more of the following personality traits indicative of underlying pregenital fixations than non-migrainous Ss: low self-revelation, low sexual

experience, low dating experience, and strong parental attachment. Other authors who do not accept the notion that migrainous Ss are pregenitally fixated might still suggest that migrainous Ss could weaken their repressive capabilities by chronic overwork to the point of exhaustion. These traits were also assessed in the examination of the repression model of migraine causation.

Hypothesis IA: Expression and Awareness of Anger

(1) Migrainous Ss will report less angry behavior than non-migrainous Ss. Three dimensions of behavior will be examined:

a) verbal behavior

b) physical behavior

c) passive-aggressive behavior (negativism).

(2) Migrainous Ss will report less awareness of getting angry than non-migrainous Ss, since the purpose of repression is to remove unacceptable impulses from consciousness. Awareness of anger will be assessed in four types of anger-provoking events:

a) minor chance annoyances

b) criticism

c) self-opinionated people

d) interpersonal encounters.

Hypothesis IB: Indirect Expression of Repressed Anger

In regard to Part B of Hypothesis I, traits indicating underlying repression of anger will be assessed in the following dimensions:

(1) Migrainous Ss will report significantly more fears of expressing anger than non-migrainous Ss. Fears of expressing anger could represent a conscious derivative of the repressed anger.

(2) Migrainous Ss will report more negative afterthoughts after expressing anger than non-migrainous Ss. Negative afterthoughts could represent superego injunctions against expressing anger.

(3) Migrainous Ss will report family background more strongly predisposing them to repress their anger than non-migrainous Ss. In general, psychoanalytic theory suggests that repression develops from the child's fear of losing his relationship with his parents. This should be particularly true in families where the child was threatened with loss of love as a child-rearing technique. Thus, migrainous Ss will report having parents who used threats of loss of love more often than non-migrainous Ss do.

(4) Migrainous Ss will report being more suspicious of other people than non-migrainous Ss will. Greater suspicion could be an expression of the tendency to project repressed anger onto other people.

(5) Migrainous Ss will report greater trait anxiety than non-migrainous people. Greater trait anxiety could result from frequently encountering common derivatives or stimuli of the repressed anger.

Hypothesis II: Predisposition to Anger

Based on past reports from clinical observation, it is hypothesized that migrainous Ss will report significantly more traits that might predispose them to feelings of anger than will non-migrainous Ss. If migrainous Ss are more likely to get angry, and if migrainous Ss express less anger or have less awareness of anger than non-migrainous Ss (Hypothesis IA), these results would tend to confirm the psychoanalytic model of migraine causation. The following traits, which could predispose an individual to become angry, will be explored:

(A) Migrainous Ss will report more rigid lifestyles than non-migrainous Ss. Rigidity of lifestyle increases the likelihood of becoming frustrated and angry in daily life.

(B) Migrainous Ss will report greater perfectionism than non-migrainous Ss. As in the case of rigidity, perfectionistic tendencies increase the likelihood of frustration and anger.

Perfectionism will be assessed indirectly through the tendency to stick to a work task without interruption (work endurance).

(C) Migrainous Ss will report greater resentment than non-migrainous Ss. Feelings of resentment increase the likelihood of feeling angry.

(D) Migrainous Ss will report greater trait anxiety than non-migrainous Ss. Highly tense people are more likely to be nervous and irritable, and thus easier to provoke.

(E) Migrainous Ss will report strong parental attachments more often than non-migrainous Ss. If this attachment is threatened, it could generate considerable anger.

Hypothesis III: Energy Reserves for Repression

Based on past reports of clinical observation, it is hypothesized that migrainous Ss will report significantly more traits that might weaken their capacity to repress anger. Finding that Ss who have migraine tend to have reduced capacities to repress their anger, and repress their anger more than non-migrainous Ss (Hypothesis IA and IB) would tend to support the psychoanalytic model of migraine causation. Specifically, this hypothesis will be explored in the following ways:

(A) Migrainous Ss will report significantly more traits indicative of pre-genital fixations than non-migrainous Ss. Pre-genital fixations tend to reduce the residual amounts of psychic energy available to maintain repressive defenses. Pre-genital fixations will be indicated by:

1) low self-revelation
2) low dating behavior
3) high parental attachment
4) low sexual experimentation.

(B) Migrainous Ss will report significantly more overwork than non-migrainous Ss. Chronic overwork to the point of exhaustion would also reduce the residual psychic energy available to maintain repression of anger. This will be measured indirectly by the variable of work endurance.

CHAPTER THREE

METHODOLOGY

Instrument Development: The Pilot Study

A personality questionnaire was developed to test the hypotheses previously outlined. A preliminary personality questionnaire was made up of 176 items, comprising 26 different scales. This questionnaire was composed of items from previously established instruments (ex: Spielberger Trait Anxiety Scale, 1961), modified items from existing instruments (ex: Buss-Durkee Hostility Inventory, 1957) and new items of particular relevance to the present study.

The preliminary questionnaire personality was administered to 99 undergraduate students enrolled in Psychology 160 and 161. This preliminary study yielded the following information:

a) The time required for administration of each scale.

b) Identification of confusing or ambiguous questions.

c) A cluster analysis of items within each scale.

This analysis permitted the elimination of inappropriate items and insured the homogeneity of items within each scale.

d) The examination of relationships between scales to check for theoretical consistency.

Using this information, a personality questionnaire was developed for use in the main study. This questionnaire contained 109 items and required about 20 minutes (estimated) to complete. The background information for these items is presented in Appendix A. A copy of the actual personality questionnaire also appears there.

Identification of Target Populations

As mentioned earlier, productive migraine research must draw its Ss samples from migraine sufferers in the general population and must not limit itself to sampling only migraine patients. However, it is impractical for a neurologist to examine a large cross-section of the general population to establish migraine status of Ss in a non-biased manner. Recognizing this, Waters (1970) suggested that since diagnosis basically depends on the patient's answers to the physician's questions about symptomatology, a questionnaire approach to diagnosis of the general population was reasonable. The migraine identification questionnaire was subsequently found to correlate almost perfectly (r=.89) with clinical diagnosis of questionnaire

respondents. Diagnosis of migraine was established by the presence of the four most common and concrete criteria related to migraine: headache in the last year, unilateral distribution of head pain during headaches, warning (prodromes) preceding headaches, and nausea and/or vomiting accompanying the headache. These criteria are those most often used during clinical examinations, and also those most often reported in past clinical research.

There is further empirical validation for this method of migraine diagnosis. Zeigler et al. (1972) performed a factor analysis of 289 headache patients' responses to 27 variables, including symptomatology and personal and family history. Analysis revealed that migraine was most accurately predicted by three of the four factors outlined above: prodromal warning, unilateral head pain, and nausea. Presumably, the criterion of headache in the last year was taken for granted.

Interestingly, other criteria often given particular emphasis in conventional medical diagnosis, such as family history of migraine, age of onset, and decreasing frequency of attacks with increasing age, were found to be uncorrelated with migraine diagnosis or the three variables outlined above. This statistical analysis both suggests the adequacy of the identification of migraine via symptomatology questionnaires, and also calls into question the

validity of some diagnostic criteria commonly used by medical practitioners.

A migraine diagnostic questionnaire has been used with success in several previous studies. Waters (1970, 1971A, 1971B, 1972; Waters and O'Connor 1970) administered such a questionnaire to almost the entire female population in Wales, U.K., in order to identify some of the epidemiological parameters of migraine incidence and its relation to other disorders. Recently, Henryk-Gutt and Rees (1973) used a similar questionnaire to identify migraine and tension headache sufferers among a group of employees of the British Government.

In keeping with these precedents, the present study utilized the four-part criteria outlined by Waters (1970) to establish the headache status of each S. A copy of the actual diagnostic questionnaire used, an improved version of the one developed by Waters (1970), is located in Appendix B. Of particular interest is the question which asked Ss if they had ever sustained a head injury that was severe enough to cause them to lose consciousness (Question #2). This question identified Ss whose headaches might be attributed to organic brain damage. Moreover, other variables of interest were contained in the questionnaire: gender, frequency, and severity of headache, whether or not medical help for headache had been

sought, general adjustment, and situations that might be associated with the onset of a headache.

Administration of the Diagnostic Questionnaire

Five thousand two hundred fifty three undergraduate students living on campus at Michigan State University during Spring term, 1975, received a questionnaire packet through the campus mail service. These Ss were randomly selected by computer, using the University Registrar's records of students registered for classes that term. Computer-printed address labels were obtained from Michigan State University Administration for these Ss, and affixed to the outside of the questionnaire packet. Each packet consisted of a 9 by 12 inch envelope, containing a cover letter of introduction (Appendix C), the diagnostic questionnaire, and an addressed return envelope. The cover letter was printed on letterhead stationary of the Psychology Department of Michigan State University, and signed by the principle investigator and two members of the Psychology Department Faculty (who served as Co-Chairmen for this doctoral thesis). The cover letter was designed to induce individuals to complete the questionnaire, and also inform them of the purpose of the research

project. Ss were also instructed not to put any personal identification on the questionnaire.

The diagnostic questionnaire (located in Appendix B) was printed on an optical-scan answer sheet so that responses could be directly transferred to computer cards for analysis. Each questionnaire was stamped with a research number that was unrelated to the student's Michigan State University identification Number. Ss were assured that their responses would remain confidential, and would not become part of any university records. The principal investigator maintained a master list of the research codes so that Ss selected for future phases of the study could be recontacted. When a completed diagnostic questionnaire was returned, it was examined to insure that pencil was used in marking answers, and stray marks were removed. The research identification code, printed on the bottom of each questionnaire, was entered by hand into the appropriate optical-scan scoring grid, and then scored by the Michigan State University Evaluation Service.

Of the 5253 M.S.U. students sampled, 3616 (approximately 69 per cent) returned the completed diagnostic questionnaire. In checking over the returns from each dormitory, the researcher found that one dorm had an unusually low rate of return (less than 10 per cent). It is possible that the majority of the questionnaires for this dorm

were never distributed to students by the dormitory desk clerk.[1] If this speculation is correct, the actual rate of return would have been closer to 71 per cent.

For comparison the diagnostic questionnaire was also administered to Ss from other sample populations. Responses were obtained from 293 students at New York University, 1293 adults in the Lansing/Okemos community, 26 patients at a community mental health center, and 55 student-patients at the M.S.U. Counseling Center. These Ss did not receive the follow-up personality questionnaire.

Administration of the Personality Questionnaire

Generally, Ss on the M.S.U. campus who completed and returned the diagnostic questionnaire were sent another questionnaire packet through the campus mail. This packet contained another cover letter, the rather lengthy personality questionnaire (Appendix A), an optical-scan answer sheet, and a return envelope. The second cover letter was also printed on Psychology Department stationary, and encouraged Ss to complete and return the questionnaire. A copy of the

[1]This speculation is supported by an incidence of resistance on the part of the desk clerk to distribute the 175 questionnaires to student mailboxes at the time of delivery.

cover letter for the personality questionnaire is located in Appendix C. Returned answer sheets were examined for stray pencil marks, and the appropriate research code was entered into the scoring grid prior to scoring by the Michigan State University Evaluation Service. Each S's answer sheet contained the same research number assigned to his previous diagnostic questionnaire.

The return rate of diagnostic questionnaires was unexpectedly high, and overwhelmed the original supply of 1200 personality questionnaires planned for distribution. Although 2000 additional personality questionnaires were hurriedly printed (i.e.: a total of 3200 questionnaires), 400 Ss of the 3616 Ss who returned the diagnostic questionnaires could not be provided with a second questionnaire. Inasmuch as Ss reporting head injury were to be eliminated from the data analysis, the 400 Ss not receiving the personality questionnaire were selected from this group. To insure that a suitable number of personality questionnaires were received from migrainous Ss, returns were monitored for research codes belonging to Ss identified as migrainous by the diagnostic questionnaire. Two weeks after the initial mailing of the personality questionnaire, migrainous Ss for whom no return had been received were contacted by telephone and encouraged to complete and return their forms.

Of the 3200 personality questionnaires sent out to respondents of the diagnostic questionnaire, 2306 questionnaires (72 per cent) were returned. Thus, complete data was obtained for 44 per cent of the over 5,000 Ss originally contacted on the M.S.U. campus.

CHAPTER FOUR

INSTRUMENT CHARACTERISTICS

Chapter Summary

This chapter presents the psychometric characteristics of the 30 personality scales used in the present study, as established via responses from 2306 Ss. A content description of each scale (Table 2), its mean score, standard deviation, and reliability coefficient (alpha) are presented (Table 3). The origin of each scale is outlined in Appendix One.

Reliability

Scale reliability varied from a high of .87 to a low of .44; typical reliability was approximately .71. Scale composition varied from 2 to 15 items.

Content Validity

Examination of the item content tended to confirm high content validity. New scales constructed for use in this study were

TABLE 2

DOMAIN OF QUESTIONNAIRE SCALES

Scale Name	Content Area
Verbal aggression	overall composite tendency to express anger verbally.
Tell-off (verbal aggression)	tendency to express anger verbally by 'telling off' another person.
Say nasty things (verbal aggression)	tendency to express anger verbally by saying nasty or insulting things to another person.
Physical aggression	overall composite tendency to express anger physically.
Hit things (physical aggression)	tendency to express anger by hitting inanimate objects.
Hit people (physical aggression)	tendency to express anger by hitting other people.
Negativism	tendency to express anger by passive-aggressive withholding.
Resentment	general feelings of frustration and resentment
Suspicion	suspicion of friendliness and truthfulness of approaches from other people.
Fear of expressing anger	fear of repercussions of expressing anger to other people (prior to expression).
Negative afterthoughts	guilt and ruminations following the expression of anger.

TABLE 2 (cont'd.)

Scale Name	Content Area
Rigidity	inflexibility and constriction of life style.
Parental attachment	low emotional individuation from parents.
Self-revelation	tendency to reveal personal feelings to others.
Trait anxiety	predisposition to experience state anxiety.
Trait anxiety (NEG indeces)	items in trait anxiety scale, worded to assess the absence of trait anxiety.
Trait anxiety (POS indeces)	items in trait anxiety scale, worded to assess the presence of trait anxiety.
Work endurance	tendency to stick to a task until completed.
Sexual experiences	Guttman scale assessing range of sexual experiences.
Dating experiences	frequency of dating contacts and degree of emotional commitment to dating partners.
Self-concept	satisfaction with self as an individual, and evaluation of personality.
Sexual morality	rejection of pre-marital sexuality.
Parental discipline	overall composite report of parents having used withdrawal of love for discipline during respondent's childhood.

TABLE 2 (cont'd.)

Scale Name	Content Area
Mother discipline (parental discipline)	report of mother having used withdrawal of love for discipline during respondent's childhood.
Father discipline (parental discipline)	report of father having used withdrawal of love for discipline during respondent's childhood.
Total provocation	composite score of the degree of anger provoked by common daily frustrations.
Minor chance annoyance (provocation)	degree of anger provoked by minor chance annoyances.
Self-opinionated people (provocation)	degree of anger provoked by self-opinionated people.
Criticism (provocation)	degree of anger provoked by criticism from others.
Interpersonal encounters (provocation)	degree of anger provoked by being mistreated by others.

TABLE 3

PSYCHOMETRIC CHARACTERISTICS OF THE PERSONALITY SCALES

Scale Name		#Items	Mean	S.D.	Alpha
1	Verbal aggression	7	1.8046	.4149	.77
2	Physical aggression	8	1.3522	.3318	.73
3	Negativism	3	1.4784	.4085	.54
4	Resentment	3	1.7398	.4538	.49
5	Suspicion	4	1.5313	.4292	.63
6	Fear of expressing anger	4	1.7999	.4682	.61
7	Negative after thoughts	5	1.9467	.5068	.81
8	Rigidity	2	1.9952	.5706	.67
9	Parental attachment	4	1.5978	.4092	.54
10	Self-revelation	3	2.1717	.5747	.62
11	Trait anxiety	10	2.0061	.5490	.86
12	Work endurance	3	2.1594	.4695	.52
13	Sexual experience	4	1.3483	.3683	.80
14	Dating experience	4	3.2522	.8080	.78
15	Self-concept	3	2.4514	.4855	.70
16	Morality	5	2.5037	1.048	.81
17	Parental discipline	8	1.4142	.4538	.83
18	Minor chance annoyances	3	2.2649	.5595	.44
19	Self-opinionated people	3	2.6360	.7877	.78
20	Interpersonal encounters	6	3.2102	.6609	.70
21	Criticism	3	2.3293	.7602	.57
22	Total provocation	15	2.6101	.5319	.84
23	Tell off (verbal aggression)	3	1.8768	.5072	.68
24	Nasty (verbal aggression)	4	1.7506	.4804	.74
25	Hit things (physical aggression)	6	1.3256	.3602	.75
26	Hit people (physical aggression)	2	1.4320	.5731	.71
27	Trait anxiety (NEG indeces)	5	2.0146	.6644	.84
28	Trait anxiety (POS indeces)	5	1.9985	.5834	.77
29	Mother discipline	4	1.4096	.4902	.79
30	Father discipline	4	1.4191	.6072	.87

primarily developed with the criterion of high content validity in mind. Such poor items as had survived initial screening were found and eliminated in the pilot study. Cluster analysis tended to confirm the content categories of the various scales.

Construct Validity

Scale intercorrelations were examined in detail, and correlations corrected for attenuation were obtained. Styles of expressing anger (Verbal Aggression, Physical Aggression, and Negativism) were found to be moderately positively correlated. Subscales of the Verbal Aggression scale ('saying nasty things' and 'telling people off directly') and Physical Aggression Scale ('hitting other people' and 'hitting inanimate objects') were also found to be moderately positively correlated. Generally, directness or indirectness in expression of anger tended to be consistent across different modes of anger expression.

Styles of expressing anger were found to be related to personality traits in ways one might expect. People with fears of expressing anger were far more likely to express anger passive-aggressively than by direct verbal expression. When people with fears of expressing anger used physical means of anger expression,

they were more likely to hit inanimate objects than to hit other people. Of the styles of expressing anger, passive-aggressive ways were found to be most closely associated with lasting feelings of resentment.

Similarity of the subscales of the Provocation Scale were found to vary from being moderately similar to virtually identical. In general, people provoked to anger by one type of event tended to get angry over other events assessed in the Provocation Scale.

The degree of anger provoked by the events assessed in the Provocation Scale was related to personality traits in expected ways. People who were most provoked tended to have rigid and inflexible life-styles, high trait anxiety, low self-esteem, and resentful attitudes toward others.

Provocation scores and styles of expressing anger were also found to be related in theoretically consistent ways. People who were most angered tended to express the most anger, regardless of the style of expression considered. Moreover, people who were provoked by common petty annoyances tended to be particularly prone to passive-aggressive expression.

Scores of the 30 personality scales tended to be independent of S's background variables. Significant correlations between personality traits and background variables tended to occur in

theoretically comprehensible ways. People with poor sense of well-being tended to be resentful, suspicious, easily provoked to anger, fearful of expressing anger, non-self-revealing, and had low self-concept. People with higher frequencies of headache tended to be easily provoked to anger and had more trait anxiety.

Overall, scores on the personality scales tended to be independent of the gender of the respondent. Of the few significant relationships observed, females reported stronger parental attachments and more conventional views on pre-marital sexuality than males. Females also were more easily provoked to anger when treated without respect or consideration in interpersonal encounters, compared to males.

In conclusion, responses to the personality scales tended to occur along theoretically consistent and expected lines. Relationships among the personality scales indicate the instrument possesses good construct validity.

Scale Reliability

Table 2 presents a description of the thirty personality scales contained in the personality questionnaire. The sources of

these scales are specified in Appendix A. It should be noted that several of the scales are actually composed of sub-scales which tap particular areas of relevance to that dimension. The verbal aggression, physical aggression, parental discipline, trait anxiety, and provocation scales are such scales. These subscales are located immediately after the aggregate cluster (noted in parentheses following the subscale). The actual item lists for each scale are presented in Appendix D.

Table 3 presents mean, standard deviation, reliability (alpha), and number of items for the personality scales. Caution should be exercised in comparing means of the various scales, as a quick reference to the actual questionnaire will indicate that the scoring systems differ in some cases. Scales varied widely in the number of items, ranging from a high of 15 items (total provocation) to a low of 2 items (rigidity). Moreover, there was some variation in reliability of the scales, ranging from a high of .87 (father discipline) to a low of .44 (minor chance annoyances). Typical reliability is approximately .71 overall.

Scale Content Validity

Approximately six months were devoted to developing instruments of high content validity. A search of the literature revealed few appropriate instruments of high content validity. Existing questionnaire items were used in the present study whenever their face validity made this possible. New items were independently generated by this author and one of the co-chairmen of this dissertation. Content validity was established by mutual agreement.

Content validity was further established via the administration of all items to 99 Ss in the pilot study (outlined in the Methodology Section). Ss were asked to note any item which was confusing, ambiguous, or generally unclear. All such items were dropped from use in the central portion of the study. Cluster analysis of response tended to confirm the content categories of the various scales.

Scale Construct Validity

Intercorrelation of Personality Scales

The intercorrelations between clusters are presented in Table 4. These correlations represent the relationships among the clusters themselves. The upper half of the table presents the

TABLE 4

INTERCORRELATION OF THE SCALES

N = 2306; p < .05, r = .04; p < .01, r = .05

observed correlations, whereas the lower half contains the correlations after correction for attenuation. As would be expected, the clusters having the lowest reliability (as specified in Table 3) show the largest increases when they are corrected for attenuation. One outstanding example of this increase in correlation is evident for the Resentment cluster, with a reliability of r=.49. Similarly, the correlations for the Negative Afterthoughts cluster (reliability r=.81) display very little increase after correction.

In examining the corrected correlations, the relationships between particular groups of clusters are evident. The three clusters assessing styles of expressing anger (Verbal Aggression, Physical Aggression, and Negativism) are only moderately correlated amongst themselves, with correlations ranging from r=.32 to r=.41. That is, styles of expressing anger tend to be variable. The Fear of Expressing Anger and Negative Afterthoughts clusters, which assess feelings about expressing anger, were found to be highly correlated (r=.77), indicating that people who fear expressing anger are strongly prone to ruminating about it if they do express it. It also appears that feelings before and after expressing anger tend to be more related than the styles of behavior used to express that anger.

Although it is beyond the range of the present study, the data presented in Table 4 can be used to examine various 'clinical

hypotheses' about the interrelation of personality traits. To pursue the example of parental attachment, results indicate that people with high parental attachment tend to have higher resentment (r= .40), higher fears of expressing anger (r=.39), high rigidity of lifestyle (r=.29), low self-concept (r=.23) and high trait anxiety (r=.37). Surprisingly, sexual experiences and dating history are almost unrelated to parental attachment (r=-.12 and r=-.08, respectively).

From the data presented in Table 4, it is possible to more finely discern the nuances of styles of anger expression, feelings of anger, and their relation to various personality traits. For the reader's convenience, this data will be abstracted from Table 4 and presented more clearly in Tables 4A through 4E.

The tendency to express anger verbally can be examined in terms of the tendency to say nasty, cutting, indirect things, and the tendency to tell someone off directly.[1] Physical aggression can also

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[1]This paragraph contrasts correlation coefficients for telling people off and saying nasty things. Since these variables are positively correlated, a majority of people who score high on one variable would also score high on the other. That is, telling someone off and saying nasty things are not mutually exclusive categories. Technically, the proper contrast in this situation is between Beta (β) weights, rather than correlation coefficients. However, the results for Beta weights would not differ substantially from the results contrastinc correlation coefficients.

be separated into the tendency to hit inanimate objects and the tendency to hit other people. Results in Table 4A indicate that people who use one means of verbal expression are more likely to resort to other verbal means ($r_{\text{nasty, tell off}} = +.58$), than they are to use physical means ($r_{\text{nasty, physical}} = +.41$) ($r_{\text{tell off, physical}} = +.26$). Moreover, people who say nasty things are more likely to hit inanimate objects when angry ($r = +.30$) than are people who tell off directly ($r = +.14$), while there is no difference between groups in likelihood of hitting other people. People who hit other people are more likely to also tell other people off directly ($r = +.34$) than are people who hit inamimate objects ($r = .14$).

People who tended to use verbal means of expressing their anger were somewhat more likely to also use passive aggressive ways of withholding ($r = +.41$) than were people who used physical means of expression ($r = +.32$). People who say nasty things were distinctly more likely to use negativism to also express their anger ($r = +.49$) than were people who told someone off directly ($r = +.19$). Among people who used physical means of expressing anger, there was no difference between people who hit other people ($r = +.26$) and people who hit other things ($r = +.25$) in the tendency to use negativism. Thus, directness or indirectness of anger expression generally tends to

TABLE 4A

INTER-RELATION OF STYLES OF EXPRESSING ANGER
(corrected for attenuation)

(1) Verbal aggression	(1)						
(2) Say nasty things	.88*	(2)					
(3) Tell off directly	.80*	.58	(3)				
(4) Physical aggression	.40	.41	.26	(4)			
(5) Hit people	.42	.39	.34	.61*	(5)		
(6) Hit things	.26	.30	.14	.91*	.29	(6)	
(7) Negativism (passive-aggressive)	.41	.49	.19	.32	.26	.25	(7)

*These part-whole correlations are already spuriously high and were not corrected for attenuation.

N = 2306; $p < .05$, $r = .04$; $p < .01$, $r = .05$

carry over across modes of expression. Ultimately, styles of expressing anger tend to be positively correlated.

Table 4B shows finer distinctions in the relationship between anger expression and personality characteristics are possible. People who tell off directly have low fears of expressing anger ($r = -.52$) and few negative afterthoughts ($r = .36$). It is not possible to make any of these predictions for people who say nasty things ($r = -.03$; $r = -.06$, respectively). People who tell off are generally more self-revealing about their feelings ($r = +.19$) than are people who say nasty things ($r = -.07$), and tend to have higher self-esteem ($r = +.17$) than 'nasty' people ($r = -.19$). People who say nasty things tend to have trait anxiety more consistently ($r = +.26$) than people who tell off other people directly ($r = -.09$), and they are easier to provoke ($r_{\text{nasty,provoke}} = +.33$; $r_{\text{tell off, provoke}} = +.14$). People who express anger verbally by saying nasty things are also more likely to feel lasting resentment ($r = +.49$) than are people who tell someone off ($r = +.09$). People who say nasty things are also more likely to feel suspicious of others ($r = +.30$) than are people who verbalize anger directly ($r = +.08$).

Fears preceding the expression of anger are more closely related to the style of anger expression than are negative afterthoughts.

TABLE 4B

INTER-RELATION OF STYLES OF ANGER EXPRESSION AND PERSONALITY VARIABLES
(corrected for attenuation)

PERSONALITY VARIABLE	STYLES OF ANGER EXPRESSION				
	Tell off (V.A.)	Say nasty things (V.A.)	Hit people (P.A.)	Hit things (P.A.)	Negativism
Resentment	.09	.49	.26	.29	.54
Fear of expressing anger	-.52	-.03	-.09	+.17	.20
Negative afterthoughts	-.36	-.06	-.09	+.03	-.01
Suspicion	.08	.30	.20	.12	.38
Rigidity	-.04	.12	.06	.09	.20
Parental attachment	-.09	+.11	+.07	+.05	.19
Self-revelation	+.19	-.07	-.09	-.11	-.10
Trait anxiety	-.09	+.26	+.11	+.24	-.31
Work endurance	-.05	-.08	+.03	-.07	-.13
Sexual experience	.16	.08	.08	-.02	.04
Dating history	.08	-.01	.01	-.06	.00
Self-concept	+.17	-.19	-.07	-.17	-.22
Parental discipline	.02	.15	.09	.12	-.20
Morality	-.16	-.16	-.14	-.02	-.12

N = 2306; $p < .05$, $r = .04$; $p < .01$, $r = .05$

People with fears about expressing anger tend to use very little direct verbal expression ($r = -.52$) and are more likely to express their anger in passive-aggressive negativism and withholding ($r = .20$). People with fears of expressing anger may or may not express anger by physical means ($r = .10$, Table 4). If they do, they are more likely to express it by hitting inanimate objects ($r = .17$) than by hitting other people ($r = -.09$).

Table 4B shows feelings of resentment are related to styles of expressing anger, with the strongest relationship occurring between resentment and expressing anger through negativism ($r = .54$). It was also found that resentment was related to fears of expressing anger ($r = .49$, Table 4). However, while it is true that people who express anger in passive-aggressive ways feel more resentful, and it is true that people who have fewer fears of expressing anger feel less resentful, it is not true that the more a person expresses his anger the less resentful he feels. There is still a relationship, albeit a weaker one, between expressing anger in more direct means ($r_{\text{verbal expression, resentment}} = .36$; $r_{\text{physical expression, resentment}} = .35$, Table 4) and feeling resentful. The above-cited patterns also hold true for the Suspicion Cluster, although it is not as strong as noted for the Resentment Cluster.

Table 4B shows that people with high trait anxiety are most likely to use negativism to express their anger (r = +.31). The other likely means of anger expression by people with high trait anxiety were hitting things (r = +.24) and saying nasty things (r = +.26). People with high trait anxiety are somewhat unlikely to use more direct forms of verbal or physical anger expression ($r_{\text{tell off, T. anxiety}} = -.09$; $r_{\text{hit people, T. anxiety}} = +.11$).

Other personality characteristics were found to have little relation to styles of anger expression. Self-concept bears almost no relation to verbal or physical anger expression. However, people with high self-esteem are less likely to use negativism (r = -.22), and are also less likely to become provoked to anger in the first place (r = -.25, Table 4). One might expect people with strong parental attachments to be constrained in their use of verbal or physical aggression. However, Table 4B shows that people with parental attachments are just as likely as not to use these means. There was a slight tendency for these individuals to express anger in negativism (r = .19), which is presumably 'safer' in regard to the parental relationship.

In examining the relationship between the sub-clusters which compose the Total Provocation Scale (Table 4C), the similarity of these clusters ranged from moderately similar (r = .51,

TABLE 4C

INTER-RELATION OF PROVOCATION SUBSCALES
(corrected for attenuation)

(1) Total provocation score	(1)				
(2) Minor chance annoyances	.74*	(2)			
(3) Self opinionated people	.76*	.73	(3)		
(4) Interpersonal encounters	.82*	.96	.69	(4)	
(5) Criticism	.75*	.86	.51	.79	(5)

*Uncorrected for attenuation

N = 2306; $p < .05$, $r = .04$; $p < .01$, $r = .05$

self-opinionated people and criticism) to being virtually identical (r = .96, minor chance annoyances and interpersonal encounters). In general, people who are provoked to anger by one type of event tend to be provoked by other events assessed in the Provocation Scale. For the remainder of this presentation, the term 'provocation cluster' will be used to refer to the Total Provocation Score.

Table 4D shows that people tend to differ according to how angry they get from a given provocation. People who are easily provoked to anger are more resentful (r = .62) and more suspicious of other people (r = .31). From a causal point of view, however, it might be that people who are resentful and suspicious go around irritable and are hence easily provoked to anger. People who are easily provoked lead rigid and inflexible lifestyles (r = .34) and maintain strong parental attachments (r = .36), and they are predisposed to high trait anxiety (r = .41) and low self-esteem (r = -.25).

Table 4E shows that people who are easily provoked have only a slight tendency to utilize more physical forms of expressing anger (r = .24) than 'cooler headed' people. In fact, irritable people are just as likely to express anger verbally (r = .28) as they are to use physical means (r = .24). People who are easily provoked are most likely to express their anger by withholding behavior (negativism, r = .37). People who are easily provoked express more anger,

TABLE 4D

INTER-RELATION OF PROVOCATION SCALE AND PERSONALITY VARIABLES
(corrected for attenuation)

Personality Variance	Provocation Scale (Total)
Resentment	.62
Suspicion	.31
Fear of expressing anger	.28
Negative afterthoughts	.04
Rigidity	.34
Parental attachment	.36
Self-revelation	-.10
Trait anxiety	.41
Work endurance	-.04
Sexual experience	.06
Dating history	.07
Self-concept	-.25
Morality	.01
Parental discipline	.19

N = 2306; $p < .05$, $r = .04$; $p < .01$, $r = .05$

TABLE 4E

INTER-RELATION OF ANGER EXPRESSION STYLES AND PROVOCATION SCALES

	Total Provocation Scale	Minor Change Annoyances	Self Opinion People	Inter-personal Encounter	Criticism
Verbal aggression	.28	.33	.18	.30	.24
Physical aggression	.24	.28	.14	.22	.24
Negativism	.37	.44	.22	.33	.39
Fear of expressing anger	.28	.27	.21	.21	.33
Negative afterthoughts	.04	.05	.05	-.01	.06

N = 2306; $p < .05$, $r = .04$; $p < .01$, $r = .05$

in every mode of expression. People who are provoked by petty minor annoyances are particularly prone to passive-aggressive behavior ($r = .44$). However, this preferred method of anger expression by more volatile people is not related to massive fears of expressing anger ($r = .28$) or negative afterthoughts ($r = .04$). It may be that people who are often angry do not feel comfortable exposing their petty grievances openly, and thus resort to passive-aggressive behavior. This choice of anger expression may explain why people who are often angry have no more negative afterthoughts about expressing their gripes than do less volatile people who express their anger directly. That is to say, a large part of the anger of easily-provoked people is never acknowledged as having been expressed.

Relation of Personality and Background Scales

The intercorrelations between background variables and personality questionnaire clusters are presented in Table 5. The correlations in the upper half of the matrix are corrected for attenuation of the cluster scores, whereas correlations in the lower half are uncorrected.

TABLE 5

INTERCORRELATIONS BETWEEN PERSONALITY SCALES AND BACKGROUND VARIABLES

		Headache in the last year	Head injury	Severe or unbearable headache	Unilateral pain	Vomit/nausea	Warning	Consult doctor	Frequency of headache	General feeling	Gender	Exams give headache	Anger gives headaches	Foods give headaches	Dating gives headaches	Age	Racial background	Class standing	Terms at M.S.U.	Parents' marital status	Family income
Verbal aggression	21	2	5	7	4	3	2	-1	4	-8	11	6	12	3	3	-4	9	-4	-5	-1	3
Physical aggression	22	2	4	11	5	2	2	-1	4	-15	13	4	12	2	7	-2	6	-3	-5	1	-5
Negativism	23	4	10	7	6	5	-1	2	5	-15	9	7	14	6	4	-1	11	-2	-6	4	-8
Resentment	24	4	5	6	8	2	6	-3	11	-33	3	10	18	5	10	-5	6	-8	-9	2	-9
Suspicion	25	-2	7	13	5	6	8	7	10	-30	5	7	15	8	14	-3	8	-4	-6	8	-10
Fear of expressing anger	26	6	2	10	5	11	9	7	15	-23	-4	11	12	3	10	-2	-8	1	1	3	-5
Negative afterthoughts	27	-0	1	5	5	7	3	6	5	-9	-0	6	2	3	7	-2	-7	-0	0	1	-4
Rigidity	28	3	1	6	2	1	3	3	4	-21	2	9	7	5	7	-3	6	-3	1	2	-1
Parental attachment	29	9	-2	13	9	8	6	8	12	-10	-28	17	17	12	10	-14	11	-17	-16	0	-10
Self-revelation	30	0	5	1	3	3	-1	2	-3	26	-10	4	1	1	-4	1	-2	1	3	-1	10
Trait anxiety	31	12	-1	16	8	8	7	10	25	-56	-7	14	18	4	14	-4	4	-3	-2	7	-9
Work endurance	32	-3	1	3	1	3	2	2	2	0	5	7	-1	4	-3	10	-1	11	10	-5	4
Sexual experience	33	4	5	7	6	3	1	7	8	4	0	4	9	-3	-2	15	3	13	11	2	11
Dating experience	34	6	6	3	8	4	1	9	12	12	-10	7	9	-3	-2	8	-3	8	6	-3	12
Self-concept	35	-2	-3	-11	-1	-6	-4	-7	-16	38	1	-2	-7	-7	-11	6	-1	5	3	-7	7
Morality	36	1	-8	-3	2	-1	4	-1	4	2	-23	5	2	1	0	-13	-2	-13	-9	-1	-9
Parental discipline	37	2	1	14	7	6	8	3	12	-12	-8	8	12	7	3	1	7	0	-3	30	-15
Minor chance annoyances	38	11	-4	8	9	7	5	-0	14	-23	-4	20	24	4	9	-7	3	-9	-8	2	0
Self-opinionated people	39	5	1	11	6	1	2	2	15	-16	-10	16	17	7	6	-7	-1	-9	-8	2	-1
Interpersonal encounters	40	11	0	11	13	4	2	3	19	-21	-28	23	30	3	10	-6	6	-7	-5	4	2
Criticism	41	7	-1	7	10	2	4	1	15	-25	-14	14	19	7	7	-6	9	-5	-7	4	-8
Total provocation	42	9	-1	10	11	3	3	2	18	-23	-16	20	25	6	9	-7	5	-9	-8	3	-2
Tell off (verbal aggression)	43	3	4	4	0	-1	-2	-2	-0	4	8	-0	7	-1	-1	0	9	-1	-1	-2	3
Nasty (verbal aggression)	44	2	5	7	5	6	4	1	7	-15	11	9	14	5	6	-7	6	-5	-6	0	2
Hit things (physical aggression)	45	3	3	10	5	3	0	-1	6	-15	8	3	12	1	4	-1	2	-2	-3	0	-3
Hit people (physical aggression)	46	-2	4	6	4	-1	4	1	0	-6	16	4	5	3	9	-3	11	-3	-7	2	-5
Trait anxiety (NEG indices)	47	9	-1	11	4	4	4	6	20	-54	-0	7	10	2	12	-3	4	-2	-2	7	-9
Trait anxiety (POS indices)	48	13	-0	18	11	12	9	13	26	-47	-13	19	24	5	15	-5	2	-4	-2	5	-9
Mother discipline	49	2	-0	13	7	6	6	4	10	-11	-11	7	12	5	2	2	0	2	-0	18	-8
Father discipline	50	1	1	10	5	5	8	2	10	-9	-4	6	8	7	2	-0	9	-1	-5	30	-16
Verbal aggression	21	2	5	6	3	3	1	-1	4	-7	10	5	11	2	3	-4	8	-3	-4	-1	3
Physical aggression	22	1	4	10	5	2	2	-1	4	-13	11	4	10	2	6	-2	5	-2	-5	1	-4
Negativism	23	3	8	5	4	3	-0	2	3	-11	7	5	10	4	3	-1	8	-1	-4	3	-6
Resentment	24	3	4	5	6	1	5	-2	8	-23	2	7	13	3	7	-4	4	-6	-6	2	-7
Suspicion	25	-2	5	11	4	5	6	6	8	-24	4	5	12	6	11	-2	7	-3	-5	6	-8
Fear of expressing anger	26	5	1	8	4	8	7	5	12	-18	-3	9	10	3	8	-2	-6	1	1	3	-4
Negative afterthoughts	27	-0	1	5	4	6	3	5	5	-8	-0	6	2	2	6	-2	-7	-0	0	1	-3
Rigidity	28	3	1	5	2	1	3	3	3	-17	2	7	6	4	6	-3	5	-2	1	1	-1
Parental attachment	29	7	-2	9	7	6	4	6	9	-7	-14	13	12	9	7	-11	8	-12	-12	0	-7
Self-revelation	30	0	4	0	2	2	-0	2	-2	20	-8	3	0	1	-3	1	-1	1	2	-1	8
Trait anxiety	31	11	-1	14	7	8	7	10	23	-52	-7	13	17	4	13	-4	3	-3	-2	6	-9
Work endurance	32	-2	1	2	1	2	1	1	2	0	4	5	-0	3	-2	7	-1	8	8	-4	3
Sexual experience	33	3	5	7	6	3	1	7	7	3	0	3	8	-3	-2	13	2	12	10	2	10
Dating experience	34	6	6	3	7	3	1	8	10	10	-9	6	8	-3	-2	7	-2	7	5	-2	11
Self-concept	35	-1	-3	-9	-0	-5	-3	-6	-13	32	0	-2	-6	-6	-9	5	-1	4	2	-6	6
Morality	36	1	-8	-3	2	-1	4	-1	3	2	-21	4	1	1	0	-11	-2	-11	-8	-1	-8
Parental discipline	37	2	1	13	7	6	8	3	11	-11	-8	7	11	7	2	1	6	0	-3	27	-13
Minor chance annoyance	38	7	-3	6	6	4	3	-0	10	-15	-3	13	16	3	6	-5	2	-6	-6	1	0
Self-opinionated people	39	5	1	9	6	1	2	2	13	-14	-9	14	15	7	5	-6	-1	-8	-7	2	-1
Interpersonal encounters	40	9	0	9	11	3	1	3	16	-18	-23	19	25	3	9	-5	5	-6	-4	4	2
Criticism	41	5	-1	5	8	2	3	0	11	-19	-11	11	14	5	5	-4	7	-4	-5	3	-6
Total provocation	42	8	-1	10	10	3	3	2	17	-21	-15	18	23	6	8	-7	4	-8	-7	3	-2
Tell off (verbal aggression)	43	2	3	3	0	-1	-2	-2	-0	4	7	-0	5	-1	-1	0	8	-1	-1	-2	3
Nasty (verbal aggression)	44	2	5	6	5	5	3	1	6	-13	9	8	12	4	5	-6	5	-4	-5	0	2
Hit things (physical aggression)	45	3	3	9	4	3	0	-1	5	-13	7	3	10	1	3	-1	2	-2	-3	0	-3
Hit people (physical aggression)	46	-2	4	5	3	-0	4	1	0	-5	14	3	4	2	7	-2	9	-3	-6	1	-4
Trait anxiety (NEG indices)	47	9	-1	10	4	4	4	6	18	-50	-0	7	9	2	11	-3	4	-2	-2	6	-8
Trait anxiety (POS indices)	48	11	-0	16	10	10	8	12	23	-41	-12	17	21	5	13	-5	2	-3	-2	5	-7
Mother discipline	49	2	-0	11	7	5	5	3	9	-10	-10	7	11	4	2	2	0	1	-0	16	-7
Father discipline	50	1	1	10	5	4	7	2	9	-9	-4	6	8	6	2	-0	9	-1	-5	28	-15

Corrected for Attenuation

Uncorrected

The majority of background variables and item clusters are uncorrelated and independent. Only five background variables displayed any meaningful correlations with cluster scores. The single item assessing sense of well-being was the background variable most related to the cluster scores. People who reported themselves to be unhappy were resentful ($r = -.33$), suspicious of others ($r = -.30$), fearful of expressing anger ($r = -.23$), rigid in life style ($r = -.21$), and non-self-revealing ($r = .26$). These same people have high trait anxiety ($r = -.56$), low self-concept ($r = .38$), and were easily provoked to anger ($r = .23$). The question on well-being was developed for use as a general index of emotional adjustment and 'neuroticism' for use in assessing bias in case of a low return rate. It would appear from these correlations that this background variable did just that.

Table 5 shows that people with higher frequency of headache are more prone to trait anxiety ($r = .25$), and are somewhat prone to being provoked to anger ($r = .18$).

Several sex differences are shown in Table 5. Females report higher parental attachment than males ($r = -.20$), as well as more conventional or restrictive views on sexual morality ($r = -.23$). In contrast to these findings, sexual contact was as common among females as among males ($r = 0.0$). Females are more easily provoked in interpersonal encounters ($r = -.28$).

Table 5 shows that marriages where parents did not use withdrawal of love and attention as a means of disciplining children remained intact to a greater degree (r = +.30) than did marriages in which this practice was used. This trend was stronger for fathers' withdrawal (r = .30) than for mothers' withdrawal (r = .18).

CHAPTER FIVE

INCIDENCE OF MIGRAIN HEADACHE IN SELECTED AND NON-SELECTED POPULATIONS

Chapter Summary

Populations Sampled

This chapter presents several distinct forms of data on headache incidence in various selected and non-selected populations. The incidence of migraine in patient and non-patient populations is considered first. Responses from randomly selected non-patient Ss were obtained from samples of 3616 Michigan State University students, 293 New York University students, and 1293 adults at the Meridian Mall Shopping Center. Patient population samples consisted of 55 student-patients at the M.S.U. Counseling Center and 26 patients at a Community Mental Health Center.

Migraine Incidence

Responses to the diagnostic questionnaire revealed that migraine incidence was 7.3% in the Meridian Mall sample, 2.7% in the

M.S.U. sample, and 4.1% in the N.Y.U. sample. While migraine incidence in the Meridian Mall sample was consistent with previous reports in the literature, incidence in the student samples appeared lower than anticipated. However, the fact that the student sample was quite young (mean age = 19.5 years) and still faced half of the prime period for migraine onset suggests a reasonable explanation for finding only half of the expected migraine incidence in students compared to older adults. These findings suggested that diagnosis of migraine via the questionnaire was reasonably accurate, and that the migraine incidence found in the M.S.U. sample is not unusually low when viewed in perspective of the mean age.

However, migraine incidence among adult psychotherapy patients was twice as high (15.4%) as among non-patient adults. Moreover, migraine incidence was reported 3 times as often by student psychotherapy patients (9.1%) compared to student non-patients (roughly 3%). If psychotherapy patients were used for migraine research, the basic rate of migraine incidence would be highly overestimated.

Similar striking differences between patient and non-patient sample norms were evident on other dimensions. Frequency of report of each of the separate migraine symptoms was highly elevated in the patient populations. Moreover, both migrainous and non-migrainous Ss in the patient populations were about twice as likely to report having sought medical treatment for headaches, compared to

non-patient Ss. Reports of severe headaches were similarly twice as common in the patient populations.

Comparability of Populations

These results indicate that of the five sample populations, the non-patient M.S.U. student group was the closest approximation of the randomly sampled adult population (Meridian Mall) with regard to basic variables such as migraine incidence and seeking medical treatment. Moreover, personality studies based on samples of psychotherapy patients would tend to produce results that may not be applicable to the general population of migraine sufferers. These results tend to confirm concerns of sample selection bias and the 'clinical treatment fallacy' expressed earlier in the consideration of previous research. Finally, these results tend to support the use of samples of college students as estimates of the general adult population of migraine sufferers in the present research.

Headache Composition of the M.S.U. Sample

The second portion of this chapter reports on the incidence and characteristics of various types of headaches in the M.S.U. student sample.

The background parameters of the entire sample are presented, which include incidence of migraine symptomatology, headache frequency and severity, and related gender differences. Moreover, these and other background parameters are generally found to be relatively independent variables.

Additional data are presented for each of the five headache groups identified in the M.S.U. sample (migraine, tension headache, pseudo-migraine, no headache, and head injury). Data on the incidence, frequency and severity of headache, incidence of migraine symptomatology, gender differences, causes of headache, and general feelings of well-being are presented for each group. In rank order of frequency of diagnosis (highest frequency first), the groups were: pseudo-migraine, tension headache, head injury, no headache, and migraine headache. In rank order of frequency of report (highest frequency first) the symptoms of migraine were: unilateral head pain, sense of forewarning preceding headache (prodromes), and vomiting/nausea. Severe or unbearable headaches were reported by 71% of migrainous Ss, whereas only 20% of tension headache Ss gave similar report. Medical help was sought for their headaches by 40% of migraine Ss, whereas only 7% of tension headache Ss did. The results not only indicated sizable differences between tension headache and migraine Ss but also highlighted that research based on migraine

patients alone would have excluded the majority (60%) of the migraine Ss obtained in the present study.

Criteria for Headache Diagnosis

The initial step in analyzing the data was to divide the total population of subjects into five exhaustive diagnostic groups. The five groups consisted of: 1) Ss with migraine headache, 2) Ss with tension headaches, 3) Ss who had no headache in the last year, 4) Ss with unclear headache diagnosis [pseudo-migraine], and 5) Ss who had sustained a head injury.

Migraine Ss were identified by a positive report of all of the following symptoms: a) headache in the last year, b) unilateral head pain, c) vomiting or nausea with the headache, and d) warning preceding the headache [prodromes]. Tension headache Ss were identified by a positive report of headache in the last year, but none of the migraine symptoms. The single criterion for the "no headache (in the last year)" Ss is self-evident. Pseudo-migraine Ss were identified by a positive report of headache in the last year, but with one or two of the three remaining migraine symptoms being absent. Finally, "head injury" Ss were identified by a positive report

of headache in the last year, plus having sustained a head injury that caused loss of consciousness for a period of time.

Migraine Incidence in Patient and Non-Patient Populations

It became evident at the most preliminary stages of data analysis that an unusually low rate of migraine incidence in the M.S.U. sample might obscure an understanding of the rest of the results. Since comparative norms have not yet been established for the diagnostic questionnaire, additional sampling was undertaken to assess migraine incidence in other populations, using the same instrument. Another college student population (undergraduate psychology students at New York University) was sampled (N = 293) to obtain comparison data for the original sample of M.S.U. students (N = 3616). A sample of adults passing through a local shopping center (N = 1293) was obtained to assess migraine incidence in the general adult population.

At the outset of the study, it was suggested that the use of self-selected treatment populations might bias research data. To examine this possibility, incidence data was also collected on two other populations. Patients at a community mental health center

(N = 26) located in a nearby community (Howell, Michigan) were sampled. Data was also collected from students seeking treatment at the Counseling Center at Michigan State University (N = 55). The community mental health center clients constitute a patient population for comparison with the non-patient shopping mall Ss sample. Likewise, students in treatment at the Counseling Center were a special self-selected subgroup of the total M.S.U. student population. The group profiles from the five populations are presented in Table 6.

Symptomatology

Results in Table 6 indicate that the sample of Michigan State University students and New York University students were quite similar with respect to reports of migraine symptomatology. M.S.U. students reported 41.1 per cent unilateral headaches, compared to 44.0 per cent of N.Y. U. students. Twenty-seven per cent of M.S.U. students reported warning preceding headaches, compared to 27.3 per cent of the N.Y.U. students. Of the M.S.U. students, 18.3 per cent reported vomiting and nausea with headaches, compared to 23.2 per cent of N.Y.U. students.

Results indicate that the college students sampled did not differ very much from the sample of the general population obtained

TABLE 6

MIGRAINE INCIDENCE IN SEVERAL SAMPLED POPULATIONS

	M.S.U. Student Sample	N.Y.U. Student Sample	M.S.U. Counseling Center	Meridian Mall	Community Mental Health Center
	N=3616	N=293	N=55	N=1293	N=26
Unilateral headache	41.1%	44.0%	45.5%	41.0%	57.7%
Warning before headache	27.7%	27.3%	23.6%	29.6%	42.3%
Vomiting/Nausea with headache	18.3%	23.2%	29.1%	25.1%	57.7%
Severe/unbearable headache	34.8%	31.4%	40.0%	34.2%	76.9%
Migraine incidence	2.7%	4.1%	9.1%	7.3%	15.4%
Migraine Ss - Consulting doctor	42.9%	16.7%	60.0%	71.3%	100.0%
Non-migrainous Ss - Consulting doctor	13.1%	16.0%	32.0%	21.7%	50.0%

at the shopping mall. Forty-four per cent of the adults in the general population reported unilateral headache, 29.6 per cent reported warning preceding headaches, and 25.1 per cent reported vomiting and nausea with their headaches.

The sample of college students undergoing psychotherapy at the Counseling Center did not display profiles very different from the general population (shopping center). Of the student patients, 45.5 per cent reported unilateral headache, 23.6 per cent reported warning preceding headache, and 29.1 per cent reported vomiting and nausea with headaches.

However, the community mental health sample yielded considerably elevated reports of migraine symptomatology, compared to the general population (shopping center). Psychotherapy patients reported a 57.7 per cent incidence of unilateral headache, 42.3 per cent incidence of warning preceding headache, and 57.7 per cent incidence of vomiting or nausea with headaches.

Thus, the student and student-patient populations did not differ very much from the general population with respect to reports of individual symptomatology of migraine. However, adult psychotherapy patients were more likely to report any of the individual migraine symptoms than were adults in the general population.

Results in Table 6 indicate that adult psychotherapy patients differed even more from the other groups, with respect to reports of severe or unbearable headaches. Of adult psychotherapy patients, 76.9 per cent reported severe headaches, while only 34.2 per cent of the general population, 34.8 per cent of the M.S.U. students, 31.4 per cent of the N.Y.U. students and 40.0 per cent of the M.S.U. psychotherapy patients reported severe headaches.

Migraine Incidence

The incidence of migraine in each sample is reported in Table 6. Migraine incidence in the sample of M.S.U. students was 2.7 per cent. Migraine incidence among N.Y.U. students was 4.1 per cent. These figures were about half the rate of incidence observed in the general population (7.3 per cent). It should be noted that the observed incidence of migraine in the general population was entirely within the range of incidence reported in the migraine literature. The observed migraine incidence among the sample of college students was lower than expected.

Migraine incidence among adult psychotherapy patients was also considerably greater from that observed in the general population. Migraine incidence was observed to be 15.4 per cent, or

roughly twice as frequent in adult psychotherapy patients as in the general population.

The rate of migraine incidence among college students is not as abnormally low as it might first appear. The mean age of the M.S.U. student sample was 19 to 20 years, while past research has shown that the typical age of migraine onset is from late adolescence (15) to the early adult years (25). Roughly one half of the prime time of migraine onset remains for the college student sample. Casual observation of Ss at the shopping mall indicated the vast majority of Ss were over 30 years of age. By this age, the bulk of the potential migraine sufferers in the adult sample are already experiencing migraine headaches. Thus, it is not surprising that the observed rate of migraine incidence among college students is low. In fact the rate of about 3 per cent migraine incidence among college students is almost exactly half the rate of 7 per cent in the adult population as would be predicted by past reports of median age of onset.

However, the high migraine incidence rate (15.4 per cent) among adult psychotherapy patients is quite another matter. There is no age difference between the patient population and the general adult sample (which had only 7.3 per cent incidence). Rather, it seems that adult psychotherapy patients are about twice as likely to

be diagnosed having migraine as are adults in the general population. If psychotherapy patients are used in migraine research, the basic rate of migraine incidence would be highly over-estimated. If an experimenter had to choose between sampling a college student population and sampling a group of adult psychotherapy patients, this study's data on migraine incidence indicates the student population would give a closer approximation to the adult general population than would the adult psychotherapy patients.

Results in Table 6 indicate that psychotherapy patients are generally deviant from their respective total populations, with respect to migraine incidence. Psychotherapy patients are more likely to report having migraine than are non-patients. Of the adult psychotherapy patients 15.4 per cent reported the migraine symptom-triad, compared to 7.3 per cent of the general adult population. Likewise, 9.1 per cent of college student psychotherapy patients reported having migraine, whereas only about 3 per cent of all college students did. On the basis of migraine incidence, non-patient college students are more similar to the general adult population than are either of the psychotherapy patient populations. Psychotherapy patients report 2 to 3 times as much migraine incidence as non-patients.

Headache Treatment

Another dimension along which populations vary is consulting a doctor for headache treatment. College students were less likely to seek medical treatment for headache than adults in the general population: 42.9 per cent of migrainous college students, compared to 71.3 per cent of migrainous adults. Likewise, 13.1 per cent of non-migrainous college students sought treatment, compared to 21.7 per cent of non-migrainous adults. This general trend of students to seek medical treatment less often than adults may stem from several sources. First, working adults may seek treatment more often because headaches interfere with their work responsibilities, whereas students can be more flexible and schedule their work around their headaches. Second, working adults may anticipate better and friendlier medical care than students can anticipate at the University Health Center. In either case, one might expect this difference in seeking treatment to diminish as these students graduate and enter the labor market.

However, there is nothing to suggest that the differences between psychotherapy patient populations and non-patient populations in seeking medical treatment will diminish with time. One hundred per cent of migrainous adult psychotherapy patients and 50 per cent of non-migrainous adult psychotherapy patients sought treatment.

In comparison, 71.3 per cent of the migrainous adult non-patients and 21 per cent of non-migrainous non-patient adults sought treatment. Likewise, 60 per cent of migrainous students receiving psychotherapy and 32 per cent of non-migrainous patient-students sought treatment, compared to 42.9 per cent of migrainous non-patient students, and 13.1 per cent of non-migrainous non-patient students.

Thus, non-migrainous psychotherapy patients are about twice as likely to seek treatment for headache than are non-migrainous non-patients. Moreover, migrainous psychotherapy patients are about 40 per cent more likely to seek headache treatment than are migrainous non-patients. These findings suggest that personality studies based on responses of psychotherapy patients are going to be weighted with people who seek more treatment in general than their peers who are not in psychotherapy. Thus, results based on psychotherapy patients' responses may not be applicable to the general population. The sample of college students appears to be the closest approximation to the general adult population of the sub-populations sampled.

Incidence and Characteristics of Various Types of Headache in a Randomly Selected Population

Background Characteristics of the M.S.U. Sample

Table 7 presents the list of background variables of the study, which include responses to the diagnostic questionnaire and the demographic information requested in the personality questionnaire. Table 7 also contains the means and standard deviations of the total M.S.U. sample on each background variable. The means of variables 8, 9, and 118 through 123 are not directly comparable to those of the remaining variables due to differences in scoring systems. The remaining variables (ie: 1-7, and 10-14) are dichotomous variables, scored "0" (No) or "1" (Yes). Thus, it can be seen from Table 4 that 95 per cent of the Ss sampled had at least one headache in the last year, while only 35 per cent reported having a severe headache. Moreover, only 14 per cent of all Ss ever consulted a doctor for their headaches.

If we could assume that every person who sought medical treatment (14 per cent of the total sample) had been among the severe headache group (34 per cent of the total sample), then we could conclude that about 60 per cent of the severe headache sufferers never would have sought treatment. Since some Ss who went for treatment

TABLE 7

BACKGROUND CHARACTERISTICS OF THE M.S.U. SAMPLE

Background Variable	Mean	S.D.
Headache in the last year	.9549	.2075
Head injury	.1737	.3789
Severe or unbearable headache	.3479	.4764
Unilateral pain	.4110	.4921
Vomit/Nausea	.1828	.3866
Warning	.2702	.4441
Consult doctor	.1441	.3628
Frequency of headache	6.2734	1.5308
General feeling	2.3061	.8959
Gender	.4842	.5204
Exams give headaches	.4071	.4914
Anger gives headaches	.3778	.4849
Food gives headaches	.0843	.2779
Dating gives headaches	.0512	.2204
Age	2.4978	.6569
Racial background	1.0711	.3108
Class standing	2.0196	1.0233
Terms at M.S.U.	2.7118	.9225
Parents' marital status	1.2147	.6093
Family Income	3.7398	1.1710

probably had non-severe headaches, the percentage of people who sought no treatment due to severe headaches is somewhat greater than 60 per cent. These findings tend to substantiate the discussion of Ss selection bias problems in previous research presented earlier in this paper.

Table 7 contains additional information. The average frequency of attacks was about two headaches per month. The average S reported being somewhat relaxed and happy most of the time ($\bar{X}$ = 2.3). Ss generally reported that two specific events were associated with their headaches: approximately 41 per cent of all Ss reported that taking or preparing for examinations gave them headaches, and anger was a source of headaches for 38 per cent of all Ss. Neither foods nor dating was generally associated with headaches (8 per cent and 5 per cent of all Ss, respectively).

Table 7 shows that the sample was equally divided between males and females, was mostly Caucasian, and had a mean age of 19.5 years. The average respondent was finishing his sophomore year, came from a home where mother and father were currently married and living together, and had a family gross income of about $16,500.

Table 7 shows that the symptoms which lead to the diagnosis of migraine vary considerably in frequency. Unilateral head pain is the most commonly reported symptom (41 per cent), followed by warning

of impending attacks (21 per cent). Only 18 per cent of all respondents report vomiting or nausea with their attacks. The relatively greater frequency of reports of unilateral head-pain and prodromal symptoms may reflect their lower symptom specificity, compared to the clearcut feature of vomiting.

Intercorrelation of the Background Variables

The intercorrelations among the 20 background variables are presented in Table 8. Overall, the background variables are relatively independent of one another.

Results presented in Table 8 indicate that the criteria for migraine diagnosis (i.e.: headache in the last year, unilateral headache, vomiting or nausea, and warning preceding headache) tend to occur relatively independently of each other. The largest of these small positive correlations is that between a sense of warning preceding attacks and nausea/vomiting during the headache. While the four indicators of migraine are relatively uncorrelated with each other, they are all correlated with the other background variables in the same way.

The relationships among the four events associated with headaches (taking exams, getting angry, eating foods, and dating) are

TABLE 8

CORRELATIONS BETWEEN BACKGROUND VARIABLES

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1 headache in the last year	100																			
2	11	100																		
3	11	13	100																	
4	36	52	25	100																
5	25	51	-11	39	100															
6	13	39	-13	12	10	100														
7	10	03	-02	00	-02	-02	100													
8 head injury	10	03	-02	-03	-04	-10	03	02	100											
9	-13	-11	-02	-03	-04	-10	02	01	11	100										
10	-12	-12	-03	-04	-04	-10	02	02	11	10	100									
11	-12	-14	-03	-04	-04	-10	02	02	11	10	10	100								
12 severe or unbearable headache	100	14	27	16	11	33	11	-10	08	26	09	12	21	50						
13	-11	-10	-08	-10	-08	-10	02	01	10	10	10	10	100							
14	10	06	14	17	15	29	12	05	06	12	09	10	10	100						
15 unilateral head pain	10	06	14	17	15	29	12	05	06	12	09	10	10	10	100					
16	-12	-11	-07	-08	-07	-10	02	01	10	10	10	10	10	10	10	100				
17	-12	-13	-07	-08	-07	-10	02	01	10	10	10	10	10	10	10	10	100			
18	-12	-13	-07	-08	-07	-10	02	01	10	10	10	10	10	10	10	10	10	100		
19 vomiting or nausea	10	14	17	16	16	27	14	01	12	13	11	11	13	11	11	11	11	11	100	
20	-11	-11	-06	-07	-06	-10	02	01	10	10	10	10	10	10	10	10	10	10	10	100
21	-11	-11	-06	-07	-06	-10	02	01	10	10	10	10	10	10	10	10	10	10	10	10
22 warning preceding headache	10	11	13	16	12	26	08	05	05	26	06	10	10	10	10	10	10	10	10	10
23	-10	-11	-06	-08	-07	-10	02	01	10	10	10	10	10	10	10	10	10	10	10	10
24 consulted doctor for headache	10	25	17	08	07	13	02	03	11	11	10	10	10	10	10	10	10	10	10	10
25	-11	-11	-07	-08	-07	-10	02	01	10	10	10	10	10	10	10	10	10	10	10	10
26 frequency of headache	10	19	18	26	09	13	12	00	12	10	10	10	10	10	10	10	10	10	10	10
27	-11	-11	-06	-07	-06	-10	02	01	10	10	10	10	10	10	10	10	10	10	10	10
28 general well-being	10	11	13	11	10	13	12	11	13	11	11	11	11	11	11	11	11	11	11	11
29	-11	-12	-06	-07	-06	-10	02	01	10	10	10	10	10	10	10	10	10	10	10	10
30 gender	10	19	17	11	10	12	12	09	14	10	10	10	10	10	10	10	10	10	10	10
31	-11	-11	-06	-07	-06	-10	02	01	10	10	10	10	10	10	10	10	10	10	10	10
32 exams give headache	10	27	16	16	13	16	14	03	13	10	10	10	10	10	10	10	10	10	10	10
33	-10	-10	-06	-06	-05	-10	02	01	10	10	10	10	10	10	10	10	10	10	10	10
34 anger gives headaches	10	17	15	10	11	14	11	01	11	10	10	10	10	10	10	10	10	10	10	10
35	-11	-11	-06	-07	-06	-10	02	01	10	10	10	10	10	10	10	10	10	10	10	10
36 foods give headaches	10	11	10	04	02	13	03	03	10	10	10	10	10	10	10	10	10	10	10	10
37	-10	-10	-06	-06	-05	-10	02	01	10	10	10	10	10	10	10	10	10	10	10	10
38 dating gives headaches	10	01	13	02	04	10	02	04	10	10	10	10	10	10	10	10	10	10	10	10
39	-10	-10	-06	-06	-05	-10	02	01	10	10	10	10	10	10	10	10	10	10	10	10
40 age	10	09	26	07	06	24	04	04	10	10	10	10	10	10	10	10	10	10	10	10
41	-10	-10	-06	-06	-05	-10	02	01	10	10	10	10	10	10	10	10	10	10	10	10
42 racial background	10	04	36	07	06	17	04	04	10	10	10	10	10	10	10	10	10	10	10	10
43	-10	-10	-06	-06	-05	-10	02	01	10	10	10	10	10	10	10	10	10	10	10	10
44 class standing	10	07	30	07	06	02	04	04	10	10	10	10	10	10	10	10	10	10	10	10
45	-10	-10	-06	-06	-05	-10	02	01	10	10	10	10	10	10	10	10	10	10	10	10
46 terms at M.S.U.	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
47	-10	-10	-06	-06	-05	-10	02	01	10	10	10	10	10	10	10	10	10	10	10	10
48 parents' marital status	10	27	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
49	-10	-10	-06	-06	-05	-10	02	01	10	10	10	10	10	10	10	10	10	10	10	10
50 family income	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

N = 2306; p < .05, r = .04; p < .01, r = .05

also presented in Table 8. Generally, the correlations between them are rather small, indicating that people who have headaches in one situation are not particularly prone to have headaches in the other conditions. The most closely related circumstances associated with headaches are taking exams and getting angry (r = .27). Having headaches from eating particular foods is independent of headache experiences in the other three situations.

Table 8 reveals that people who had more frequent attacks also had a slightly greater tendency to experience any of the migraine diagnostic symptoms ($r_{f,\ \text{headache last year}} = .22$; $r_{f,\ \text{unilateral}} = .17$; $r_{f,\ \text{vomit}} = .16$; $r_{f,\ \text{warning}} = .13$). Females were slightly more likely than males to have a large number of headaches (r = .18). In general, people who had a large number of attacks were also more likely to report their attacks were severe (r = .31).

Of the four events associated with headaches in the questionnaire, taking exams and getting angry were the two events most closely associated with higher frequencies of attacks (r = .28, r = .26 respectively). Dating was somewhat less associated with attacks (r = .13), and reactions to particular foods were even less so (r = .09). Females reported a slightly greater tendency to experience headaches in conjunction with taking exams (r = .19) and getting angry (r = .17) than did males.

Table 8 shows that consulting a doctor for headache treatment was associated with having severe attacks (r = .31) and with high frequency of attacks (r = .25). Women, noted above to have slightly more frequent headaches, were also slightly more likely to seek treatment (r = -.11).

Table 8 shows that males are more likely to report incurring a severe head injury than are females (r = .13). This small difference probably stems from sex differences in play behavior during childhood.

Results in Table 8 indicate that the remaining background variables (age; race; class standing; number of terms on campus; family income; and parents' marital status) tended to be relatively independent of each other, and independent of the background variables already mentioned. The marriages of parents of higher income levels were more likely to remain intact than those of low income parents (r = -.27).

Specific Characteristics of Headache Groups in M.S.U. Sample

The profiles of the five headache groups, on each of the background variables, are presented in Tables 9A through 9D. Table 9A indicates the largest single group was composed of people who had one or

TABLE 9A

HEADACHE GROUP CHARACTERISTICS (PART I)

Diagnostic Group	Migraine	Tension	No Headache in Last Year	Pseudo-Migraine	Head Injury
Sample Size	N = 107	N = 1029	N = 129	N = 1723	N = 628
Headache in last year	N = 107 100%	N = 1029 100%	N = 0 0%	N = 1723 100%	N = 594 94.6%
Unilateral headache	N = 107 100%	N = 0 0.0%	N = 19 14.7%	N = 1114 64.7%	N = 246 39.2%
Vomiting and Nausea with headache	N = 107 100%	N = 0 0.0%	N = 14 10.9%	N = 416 24.1%	N = 124 19.7%
Warning before headache	N = 107 100%	N = 0 0.0%	N = 16 12.4%	N = 704 40.9%	N = 150 23.9%
Headaches severe or unbearable	N = 76 71%	N = 206 20%	N = 15 11.6%	N = 721 41.8%	N = 240 38.2%
Doctor consulted for headache	N = 43 40.2%	N = 70 6.8%	N = 7 5.4%	N = 284 16.5%	N = 111 17.7%

TABLE 9A (cont'd.)

Frequency of Attacks					
Several a day	N = 1 .9%	N = 3 .3%	N = 0	N = 17 1%	N = 3 .5%
Daily	N = 1 .9%	N = 7 .7%	N = 1 .8%	N = 24 1.4%	N = 7 1.1%
5-6 per week	N = 11 10.3%	N = 9 .9%	N = 1 .8%	N = 55 3.2%	N = 18 2.9%
2-4 per week	N = 19 17.8%	N = 59 5.8%	N = 1 .8%	N = 224 13%	N = 66 10.6%
1 per week	N = 16 15%	N = 90 8.8%	N = 1 .8%	N = 264 15.4%	N = 72 11.5%
2-3 per month	N = 31 29%	N = 249 24.3%	N = 0	N = 454 26.4%	N = 141 22.6%
1 monthly or bimonthly	N = 15 14%	N = 245 23.9%	N = 2 1.7%	N = 374 21.8%	N = 144 23%
Less than 6 per year	N = 13 12.1%	N = 363 35.3%	N = 112 94.9%	N = 307 17.9%	N = 174 27.8%
No answer	N = 0	N = 4	N = 11	N = 4	N = 3
Average Frequency	2-4 per month	1-3 per month	less than 6 per month	2-3 per month	1-3 per month

two symptoms of migraine (pseudo-migraine, N - 1723). Tension headache was the second most frequent diagnosis (N = 1029), while persons with head injuries made up the third largest group (N = 628). The fourth group was composed of people with no headache in the last year (N = 129), while the least common diagnosis was migraine headache (N = 107).

These data provide a basic framework for examining avrious headache phenomena. First off, almost 96 per cent of the people sampled experienced headache in the last year. It was relatively rare for an individual to be headache-free for a 12-month period (4.5%). Moreover, migraine headache was even less common (2.9%) than no headache at all. Tension headache was considerably more common than migraine (28.4%). However, almost half of the people sampled had headaches with one or two symptoms of migraine (47.6%), which means that there were more than 1-1/2 times more people with some of the symptoms of migraine than there were people with no migraine symptoms. More than one person in ten had a head injury that left them unconscious for a period of time (17.3%).

Table 9A presents additional information about migraine symptomatology. Unilateral head pain was the most commonly reported migraine symptom in the total population (41.1%) and was reported by 64.7% of the pseudo-migraine groups. A sense of warning preceding the headache attack was reported by 27% of the total population, and

by 40.9% of the pseudo-migraine group. The most clear-cut symptom, nausea and vomiting, was the least frequently reported symptom (18.3%) by the total population and was reported by only 24.1% of the pseudo-migraine group. This rank ordering of migraine symptomatology frequency was also apparent in the reports from people with head injuries and people having no headache in the last year. Reports from the no-headache group presumably indicated they experienced headaches with some of the migraine symptoms prior to the last year, and thus were not always headache-free. However, their headaches tended to be mild and relatively unaccompanied by additional symptomatology. Of course, all of the "migraine" Ss indicated having 100% of the symptoms, and none of the "tension" headache Ss reported any of the symptoms, as this was the criterion for diagnostic labeling.

Headache severity.--More than one-third of all Ss reported having severe or unbearable headaches (34.8%). However more migraine Ss reported having severe headaches than any other group (71%). Pseudo-migraine and head-injury Ss had about the same number of severe headache sufferers (41.8% and 38.2%, respectively), which was about half the frequency found among migraine Ss. Very few tension headache Ss reported having severe headaches (20%), indicating severity to be one variable that distinguished migraine from tension

headache as tension headache was defined for this study. Results did not indicate whether this difference in severity referred to greater headache pain or to the additional disruption in living that migraine symptoms create. More than one person in ten who had not had a headache in the past year reported remembering a headache before that time that was severe or unbearable.

Medical treatment for headache.--In general, one person in seven sought treatment for headache at some time (14.2%). However, people in the migraine group sought medical treatment for their headaches more frequently than any other group (40.2%). People in the pseudo-migraine and head-injury groups were equally likely to seek a physician's help for their headaches (16.5% and 17.7%, respectively), although both groups sought treatment far less frequently than did people with migraine. Relatively few Ss with tension headache saw a doctor for their headaches (6.8%), as was also true of the Ss having no headache in the last year (5.4%).

Headache frequency.--Additional background parameters of the headache groups are presented in Table 9A. Results indicate that having headaches daily or several a day was relatively rare (1.8%, total sample). About one-quarter of the population (25.6%) experienced a headache one to four times a week. Another quarter of the

population (24.3%) experienced a headache two or three times a month. Another 21.7% experienced a headache monthly or bi-monthly, while 27.0% had less than 6 headaches per year.

In examining the distribution of headaches for each headache group, wide differences are apparent at some frequencies, while little differences appear at others. Almost all of the people who had no headache in the last year (94.9%) had less than 6 headaches in previous years. In contrast, 44.9% of the migraine group had an average of one or more headaches per week. Neither the tension headache group (16.5%), nor the pseudo-migraine group (34%), nor the head-injury group (26.6%) reported as large an incidence of high headache frequency (1 or more a week), as the migraine group. Rather, these groups reported a preponderance of headaches occurring once a month or less (tension headaches = 59.2%; pseudo-migraine = 39.7%; head injury = 50.8%), in contrast to the migraine group (26.1%). All the headache groups reported approximately the same incidence of headaches occurring 2 or 3 times per month.

Sex composition.--Results in Table 9B indicate that the headache groups differed by sex composition, although the overall sample was balanced between males (48.1%) and females (51.9%). Migraine is about twice as common among females (65% of the migraine group) as among males. Pseudo-migraine Ss display the same predilection for

TABLE 9B

HEADACHE GROUP CHARACTERISTICS (PART III)

Diagnostic Group	Migraine Headache	Tension Headache	No Headache in Last Year	Pseudo-Migraine	Head Injury
Sample Size	N = 107	N = 1029	N = 139	N = 1723	N = 628
Gender					
Male	N = 36 33.6%	N = 534 51.9%	N = 92 71.3%	N = 679 39.4%	N = 397 63.2%
Female	N = 70 65.4%	N = 495 48.1%	N = 37 28.7%	N = 1043 60.5%	N = 230 36.6%
Causes of headaches					
Exams give headaches	N = 60 56.1%	N = 370 36.0%	N = 15 11.6%	N = 785 45.6%	N = 242 38.5%
Anger gives headaches	N = 61 57%	N = 314 30.5%	N = 23 17.8%	N = 747 43.4%	N = 221 35.2%
Foods give headaches	N = 25 23.4%	N = 59 5.7%	N = 9 7%	N = 155 9%	N = 57 9.1%
Dating gives headaches	N = 14 13.1%	N = 29 2.8%	N = 2 1.6%	N = 111 6.4%	N = 29 4.6%

TABLE 9B (cont'd.)

General Adjustment

very relaxed and happy	N = 9 8.4%	N = 173 16.9%	N = 28 22.8%	N = 203 11.8%	N = 90 14.4%
somewhat relaxed and happy	N = 57 53.3%	N = 569 55.5%	N = 64 52.0%	N = 930 54.1%	N = 339 54.1%
neither relaxed and happy nor tense and upset	N = 24 22.4%	N = 185 18.0%	N = 24 19.5%	N = 367 21.4%	N = 120 19.1%
somewhat tense and upset	N = 16 15%	N = 86 8.4%	N = 7 5.7%	N = 206 12%	N = 73 11.6%
very tense and upset	N = 1 .9%	N = 8 .8%	N = 0	N = 9 .5%	N = 5 .8%
missing	N = 0	N = 7	N = 6	N = 5	N = 1
average general adjustment	very relaxed to somewhat relaxed	somewhat relaxed	very relaxed and happy	for the most part relaxed	somewhat relaxed

females, although not to quite the same extent (60% females). In contrast, tension headache is almost evenly distributed between males (51.9%) and females (48.1%). In further contrast, it is far more common for men to have no headache in the last year (71.3%) than for females to be headache-free (28.7%). Persons reporting a head injury are more likely to be male (63.2%) than female (36.6%).

Headache causation.--Migraine sufferers reported a wider range of causation for their headaches, as well as a greater susceptibility to these stimuli for headaches than any other group (Table 9B). Preparing for exams (56.1%) and getting angry (57%) were both reported to cause headache in over half of the migraine group. Pseudo-migraine and head-injury groups reported a more moderate degree of causation by these events, closely followed by the tension headache group. No-headache Ss reported the least degree of precipitation by these two events. Larger differences among headache groups were apparent with regard to reports of foods and dating precipitating headache. These events were charged with considerably more headaches in migraine sufferers than in any other group.

Since migraine sufferers were more susceptible to having headaches, it follows that migraine sufferers would find headaches happening coincidentally with a much wider range of stimuli than would be the case for tension headache sufferers or the other groups.

However, taking examinations and getting angry were relatively equal in their ability to trigger headaches (40.7% and 37.8%, respectively) in all Ss. Thus some of the student reports probably correspond to real causation.

General adjustment.--Table 9B presents the results for general adjustment. About half of every headache group reported feeling somewhat relaxed and happy, and less than one per cent of every group reported being very tense and upset. Approximately 20% of each headache group felt neutral or could not make up their mind. However, the real differences between headache groups occurred with regard to being very relaxed and happy, and somewhat tense and upset. More of the people with the fewest headaches (no headache in the last year) reported being very relaxed and happy (22.8%) than did any other group. Tension headache sufferers were the next most likely group to report being very relaxed and happy (16.9%), while migraine sufferers were the least likely (8.4%). Note that only half as many migraine Ss as tension headache Ss reported being very happy and relaxed. Conversely, more migraine Ss reported being somewhat tense and upset (15%) than any other group. People with no headache in the last year were the least likely to give a similar report (5.7%), and tension headache sufferers reported a similarly low likelihood (8.4%) of being somewhat tense and upset.

Tables 9C and 9D show few other differences between headache groups. The overall sample was predominantly composed of Caucasians of approximately 19 to 20 years of age, who were either freshmen or sophomores. The vast majority of students came from homes where their parents' marriage was still intact; and over half had family incomes in excess of $18,000.

TABLE 9C

HEADACHE GROUP CHARACTERISTICS (PART III)

Diagnostic Group	Migraine Headache	Tension Headache	No Headache in Last Year	Pseudo-Migraine	Head Injury
Sample Size	N = 107 2.9%	N = 1029 28.4%	N = 129 3.5%	N = 1723 47.6%	N = 628 17.3%
Average age	19-20 yrs	19-20 yrs	19-20 yrs	19-20 yrs	19-20 yrs
Racial Background					
White	N = 84 92.3%	N = 691 96.1%	N = 78 94%	N = 1158 93.8%	N = 154 93.3%
Black	N = 6 6.6%	N = 23 3.2%	N = 4 4.8%	N = 53 4.3%	N = 7 4.2%
Other	N = 2 1.1%	N = 5 .7%	N = 1 1.2%	N = 24 1.9%	N = 4 2.4%
No Answer	N = 16	N = 310	N = 46	N = 488	N = 463
Class Standing					
Freshman	N = 37 40.7%	N = 267 37.1%	N = 35 42.2%	N = 520 42.1%	N = 59 35.5%
Sophomore	N = 33 36.3%	N = 199 27.7%	N = 24 28.9%	N = 351 28.4%	N = 56 33.7%
Junior	N = 11 12.1%	N = 167 23.2%	N = 13 15.7%	N = 244 19.8%	N = 35 21.1%

TABLE 9C (cont'd.)

Graduate Student	N = 1 1.1%	N = 3 .4%	N = 1 1.2%	N = 4 .3%	N = 0
No Answer	N = 16	N = 310	N = 46	N = 489	N = 462
Average Class Standing	Sophomore	Sophomore	Sophomore	Sophomore	Sophomore
Senior	N = 9 9.7%	N = 83 11.5%	N = 10 12.0%	N = 115 9.3%	N = 16 9.6%
Parents' Marital Status					
Married and living together	N = 78 85.7%	N = 620 86.2%	N = 73 88%	N = 1069 86.7%	N = 141 84.9%
Separated or divorced	N = 9 9.9%	N = 56 7.8%	N = 3 3.6%	N = 89 7.2%	N = 17 10.2%
Mother living, Father deceased	N = 4 4.4%	N = 28 3.9%	N = 6 7.2%	N = 58 4.7%	N = 4 2.4%
Father living, Mother deceased	N = 0	N = 12 1.7%	N = 1 1.2%	N = 14 1.1%	N = 3 1.8%
Both parents deceased	N = 0	N = 3 0.4%	N = 0	N = 3 .2%	N = 1 .6%
No Answer	N = 16	N = 310	N = 46	N = 490	N = 462
Average Status	Married and Living Together	Married and Living Together	Married and Living Together	Married and Living Together	Married and Living Together

TABLE 9D

HEADACHE GROUP CHARACTERISTICS (PART IV)

Diagnostic Group	Migraine Headache	Tension Headache	No Headache in Last Year	Pseudo-Migraine	Head Injury
Sample Size	N = 107	N = 1029	N = 129	N = 1723	N = 628
Family's Gross Income					
Under $6,000	N = 6 6.7%	N = 25 3.5%	N = 2 2.5%	N = 47 3.9%	N = 6 3.7%
$6,000 - $12,000	N = 13 14.6%	N = 95 13.4%	N = 15 18.5%	N = 147 12.1%	N = 18 11%
$12,000 - $18,000	N = 17 19.1%	N = 167 23.5%	N = 14 17.3%	N = 303 25%	N = 35 21.3%
$18,000 - $24,000	N = 24 27%	N = 171 24.1%	N = 17 21%	N = 318 26.2%	N = 33 20.1%
$24,000 or more	N = 29 32.6%	N = 252 35.5%	N = 33 40.7%	N = 397 32.8%	N = 72 43.9%
No Answer	N = 18	N = 319	N = 48	N = 511	N = 464
Average Income	$17,000 - $23,000	$17,000 - $23,000	$17,000 - $23,000	$17,000 - $23,000	$17,000 - $23,000

CHAPTER SIX

PERSONALITY DIFFERENCES BETWEEN MIGRAINOUS AND NON-MIGRAINOUS PEOPLE (THE TESTING OF THE EXPERIMENTAL OBJECTIVES)

Chapter Summary

The personality differences between migrainous and non-migrainous people are examined in this chapter. The objectives of the present study were examined by comparing responses of severe migraine and severe tension headache Ss. The use of data from these Ss equated the comparison groups on a relevant headache variable: severity. Moreover, the use of data from only severe headache Ss increased the likelihood that personality differences between groups would not be masked by the potentially weaker and more random traits of non-severe headache Ss. Correlations of migraine status and personality traits are presented in Table 10. The impact of differences in frequency of headache and consulting doctors for headache treatment were partialled out from remaining correlations since results revealed severe migraine Ss had significantly greater ratings on

these variables than did severe tension headache Ss. Groups were virtually identical on all other background variables.

Differences between Severe Migraine and Severe Tension Headache Ss

In examination of Objective #1, results indicate only two statistically significant personality differences out of 46 comparisons between migrainous and non-migrainous Ss. Severe migraine Ss had significantly greater fears of expressing anger ($r = .17$, $p < .05$) and had more suspicion of other people ($r = .19$, $p < .05$). Severe migrainous Ss' greater fears of expressing anger were not attributable to any conviction that anger caused their headaches. However, the relationship between migraine status and these two personality traits were quite weak, even though these correlations were statistically significant.

No statistically significant differences were observed between severe migraine and severe tension headache Ss on any other personality variables: awareness of anger; verbal, physical, or passive-aggressive expression of anger; negative afterthoughts; resentment; rigid lifestyle; strong parental attachments; trait anxiety; work endurance; parental disciplinary techniques; sexual

experience; dating experience; self-disclosure; self-concept; and acceptance of pre-marital sexuality.

Thus, results fail to support previously reported personality traits of migrainous people. Overall, the consistent lack of personality differences tends to rule out personality as the primary or exclusive cause in migraine etiology. Results tend to argue against all known psychodynamic models of migraine causation. No psychodynamic theory to date has postulated migraine causation solely on the basis of fears of expressing anger and suspicion of other people.

Implications for the Psychoanalytic Model

The above results were also examined for implications for the psychoanalytic model of migraine causation (Objective #2). Specifically, Hypothesis I predicted that migrainous Ss would have less awareness or expression of anger and more traits indicative of underlying anger than non-migrainous people. Results fail to support this prediction, and moreover, fail to support the basic notion of the psychoanalytic model that repression of anger causes migraine. Results also fail to support the hypotheses that migrainous Ss have more traits predisposing them to anger (Hypothesis II) or more traits which limit their abilities to repress anger (Hypothesis III). Thus, results of the present study fail to provide any confidence in the psychoanalytic

model of migraine causation. Moreover, results tend to contradict previous reports from psychoanalysts that migrainous people repress their anger (more than non-migrainous people do.)

Additional Findings

Other results tend to support the constitutional model of migraine causation. The finding that migrainous Ss were significantly more likely to report foods caused headaches than were non-migrainous Ss is consistent with the constitutional model and could not be explained by the psychodynamic model. Within all migrainous Ss, those with high frequency of attacks also tended to be significantly more suspicious, more provoked by petty annoyances, higher trait anxiety, lower self-concept, and lower sexual experience.

The relationship of personality traits to headache severity (regardless of headache type) and gender were also explored. A brief summary of these results is presented at the conclusion of this chapter. A detailed presentation of these results is presented in Appendix I. Generally, a large number of personality traits were found to be significantly related to headache severity and sex of the subject; however, these correlations, though significant, are small and account for little of the variance.

Data Used for Hypothesis Testing

Several points about headache group composition should be clarified prior to the report of hypothesis testing. First, it would seem logical that the pseudo-migraine group is composed of tension headache Ss who report one or two symptoms of migraine,[1] as well as Ss with migraine-type vascular headaches who manage to avoid having one or two of the symptom triad. The pseudo-migraine group also probably contains the bulk of the Ss who have tension headache, but who report having a migraine symptom through misinterpretation of the questionnaire items.

Likewise, the head-injury group probably contains Ss whose headaches stem from physiological damage as well as Ss who escaped structural damage, but who get tension or migraine headaches. The results presented in Tables 9A and 9B tend to support this logic. The profiles of the pseudo-migraines and head-injury groups fall in-between the discrepant profiles of migraine and tension headache Ss. The pseudo-migraine and head-injury groups display mutually similar profiles.

Because of their mixed and ambiguous headache composition, the data from pseudo-migraine and head injury Ss were excluded from

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[1] It is uncommon, but not unknown, for vomiting and nausea to occur with some tension headaches.

the following analysis. The Ss in the pseudo-migraine and head injury groups were identified simply to insure their exclusion from the data used for hypothesis testing.

The data from the 'no headache' group were also excluded from the analysis below even though the hypotheses call for a comparison of migrainous and non-migrainous Ss. While people in the no-headache group are certainly non-migrainous, they compose a non-equivalent control group in comparison to migraine Ss. This writer has suggested elsewhere (Schnarch, 1974) that having headaches can have its own impact on personality. Tension headache Ss make up a non-migrainous control group that is more equivalent in regard to the experience of headaches.

However, a quick glance back to Table 9A will reveal that a comparative examination of all migraine and tension headache Ss would ingore the importance of severity in the impact of headache on personality. The migraine group is composed of Ss with predominantly severe headaches (71%), whereas the opposite is true of the tension headache group (20% severe). Psychological traits suggested to be causal of migraine should be more apparent in Ss with severe, rather than non-severe attacks. The use of only severe tension Ss provides a control group that is equivalent to the migraine group on a very relevant headache variable: severity. Therefore, only the data from severe migraine and severe tension headache Ss were compared.

Differences Between Severe Migraine and Severe Tension Headache Ss (Objective One)

Table 10 presents the mean profiles for severe migraine and tension headache Ss across all of the clusters and background variables. Three columns of correlations appear on the right-hand side of the table. The first row of correlations indicates the relationship of migraine diagnosis to each variable. This correlation is algebraically equivalent to a "t test" between the two headache groups for a given variable. The size of the correlation necessary for critical levels of statistical significance is noted at the bottom of the table.

The second column of correlations in Table 10 also assesses the size of migraine-tension headache differences, but these correlations are corrected for attenuation. These corrected correlations give a more accurate estimate of the relationships between the two headache groups and the variable of interest since error of measurement is eliminated. In general, the correction for attenuation had little impact on the tiny correlations in Table 10.

Background Differences

A quick glance at the background variables which appear at the top of Table 10 will reveal that there are statistically significant differences between the two headache groups. Severe migraine Ss

TABLE 10

DIFFERENCES BETWEEN SEVERE MIGRAINE AND SEVERE TENSION HEADACHE Ss

Scale	N = 75 Severe Migraine MEAN	S.D.	N = 166 Severe Tension MEAN	S.D.	$r_{mig,}$ Scale	$r_{mig,}$ Scale Corrected for Attentuation	$r_{frequency}$ of headache Partialed
Frequency of headache	4.27	1.622	5.16	1.375	26	26***	-
Consult doctor	0.51	0.503	0.23	0.569	21	21**	-
General feeling	1.51	0.921	1.37	0.862	- 7	- 7	- 1
Gender					- 2	- 2	1
Age	1.58	0.768	1.54	0.667	3	3	3
Racial background	0.06	0.242	0.05	0.215	3	3	5
Class standing	1.00	1.031	1.12	1.090	- 4	- 4	- 5
Terms at M.S.U.	1.66	0.923	1.81	1.009	- 6	- 6	- 7
Parents' marital status	0.20	0.506	0.23	0.624	- 3	- 3	- 3
Family income	2.71	1.263	2.85	1.249	- 4	- 4	- 6
Total provocation	2.66	0.584	2.66	0.490	1	1	1
Minor chance annoyances (provocation)	2.32	0.615	2.28	0.541	4	6	6
Self-opinionated people (provocation)	2.67	0.811	2.70	0.679	- 1	- 1	- 1
Interpersonal encounters (provocation)	3.29	0.763	3.29	0.663	0	0	0
Criticism (provocation)	2.36	0.841	2.37	0.723	0	0	0
Verbal aggression	1.84	0.407	1.84	0.390	0	0	1
Tell off (verbal aggression)	1.82	0.514	1.90	0.483	- 9	-11	-10
Nasty (verbal aggression)	1.85	0.509	1.79	0.453	6	7	8
Physical aggression	1.31	0.287	1.39	0.322	-11	-13	-10

TABLE 10 (cont'd.)

Hit things (physical aggression)	1.29	0.327	1.36	0.348	- 9	-11	- 9
Hit people (physical aggression)	1.36	0.534	1.47	0.571	- 8	- 9	- 5
Negativism	1.50	0.409	1.50	0.438	2	2	1
Fear of expressing anger	1.95	0.512	1.78	0.461	17	22**	17*
Negative afterthoughts	2.07	0.536	1.96	0.470	10	11	7
Parental Discipline	1.53	0.474	1.44	0.434	9	10	9
Mother discipline	1.51	0.491	1.49	0.526	2	2	1
Father discipline	1.55	0.659	1.40	0.499	13	14*	13
Trait anxiety	2.17	0.619	2.13	0.548	3	3	- 7
Trait anxiety (Neg indices)	2.11	0.737	2.15	0.681	- 4	- 4	-12
Trait anxiety (Pos indices)	2.24	0.678	2.10	0.561	10	11	1
Resentment	1.76	0.478	1.76	0.394	- 1	- 1	3
Suspicion	1.73	0.459	1.54	0.427	20	25***	19**
Sexual experience	1.28	0.345	1.31	0.352	4	4	3
Self-revelation	2.14	0.598	2.09	0.635	4	5	4
Parental attachment	1.75	0.474	1.64	0.378	12	17*	13
Dating experience	3.45	0.652	3.19	0.834	15	17*	13
Work endurance	2.18	0.461	2.11	0.445	7	10	8
Rigidity	2.03	0.507	2.08	0.509	- 5	- 7	- 7
Morality	2.54	0.895	2.42	1.020	6	6	5
Self-concept	2.40	0.550	2.38	0.502	2	3	9
Exams give headaches	0.56	0.500	0.44	0.498	11	11	6
Anger gives headaches	0.60	0.493	0.39	0.490	19	19**	16*
Foods give headaches	0.27	0.445	0.09	0.283	23	23***	21**
Dating gives headaches	0.17	0.381	0.04	0.194	22	22**	20**

*p < .05, r = .14; **p < .01, r = .18; ***p < .001, r = .23

had significantly more headaches than severe tension Ss ($r = +.26$, $p < .001$). Moreover, significantly more severe migraine Ss reported seeking medical help for their headaches than did severe tension headache Ss ($r = +.21$, $p < .001$). Since high frequency of headaches, as well as experiences in receiving treatment could have an effect in shaping personality, it was deemed desirable to "partial out" the effects of these two variables on the observed differences between groups. (Partialling out is a statistical procedure which yields an estimate of what the correlation would have been like, had there been no difference on the partialled variable.) The resulting correlations are presented in the third column of correlations on the extreme right of Table 10.

In looking at these correlations in the third column, no other statistically significant background differences were found to exist between severe migraine and severe tension headache Ss. In particular, the groups were found not to differ significantly in general outlook and sense of well-being.

Personality Differences

Examination of scores on the remaining scales (Table 10) indicates that extremely few personality differences were found between migrainous and non-migrainous people. Significant differences were

found on only two scales: fears of expressing anger ($r = 17$, $p < .05$), and suspicion of other people ($r = .19$, $p < .01$).

These results fail to support the overwhelming majority of personality reports of migrainous people that have appeared in the literature over the past 40 years. Migrainous Ss were not found to differ significantly from non-migrainous Ss in having more:

negative afterthoughts following expression of anger ($r = .07$)

resentment of other people ($r = .03$)

rigid lifestyle ($r = -.07$)

strong parental attachments ($r = .13$)

trait anxiety ($r = .-.07$)

work endurance ($r = .08$)

parents who used withdrawal of love as a disciplinary technique ($r = .09$)

Migrainous Ss were also found not to differ significantly from non-migrainous Ss in having less:

verbal expression of anger ($r = .01$)

physical expression of anger ($r = -.10$)

passive aggressive expression of anger ($r = .01$)

awareness of anger ($r = .01$)

sexual experience and orgasmic competency ($r = .03$)

dating experience ($r = .13$)

self-disclosure ($r = .04$)

Migrainous and non-migrainous Ss were also found not to differ significantly in level of self-concept ($r = .09$) or acceptance of premarital sexuality ($r = .05$).

Overall, the consistent lack of personality differences between migrainous and non-migrainous Ss tended to rule out psychodynamic etiology as the primary or exclusive causation of migraine. No psychodynamic theory to date has postulated migraine causation solely on the basis of fears of expressing anger and suspicion of other people.

Examination of the Psychoanalytic Model of Migraine Causation (Objective Two)

Results presented in Table 10 were also considered in detail for their implications for the psychoanalytically-oriented subset of psychodynamic theories of migraine causation.

Hypothesis One

Hypothesis I concerned the possibility that migrainous people repress their anger more than non-migrainous people. It was predicted in Hypothesis I that (A) migrainous people would express less anger than non-migrainous people, and (B) migrainous people would report

more traits indicative of underlying repression of anger than non-migrainous people.

Part A of Hypothesis I (expression of anger) was examined in two ways. First, it was predicted that migrainous Ss would report less angry behavior than non-migrainous Ss. Results in Table 10 indicate that severe migraine Ss did not differ significantly from severe tension headache Ss with regard to verbal aggression ($r = +.01$, n.s.), physical aggression ($r = -.10$, n.s.), or passive-aggressive behavior ($r = +.01$, n.s.). Although in regard to verbal aggression, severe migraine Ss displayed a slightly greater tendency to say nasty, indirect things, ($r = +.08$, n.s.) and a slightly greater tendency to avoid telling someone off directly ($r = -.10$, n.s.), both trends were far below levels of statistical significance.

Another aspect regarding the expression of anger in Hypothesis I was the prediction that migrainous Ss would have less conscious awareness of getting angry than non-migrainous Ss. Referring again to Table 10, results indicate no significant differences between severe migraine and severe tension headache Ss in the awareness of anger provoked by a wide range of experiences ($r = +.01$, n.s.). No statistically significant differences between groups were detected on any of the provocation sub-scales.

Thus, results fail to support the first part of Hypothesis I. Severe migraine and severe tension headache Ss were found not to differ significantly in the expression of anger. Mean group profiles were almost identical on this dimension.

The results regarding Part B of Hypothesis I (traits indicative of underlying repression of anger) are mixed. It was predicted that migrainous Ss would report more fears of expressing anger and more negative afterthoughts than non-migrainous Ss. Table 10 shows that severe migraine Ss reported significantly more fears of expressing anger than severe tension headache Ss ($r = +.17$, $p < .01$), but the groups did not differ significantly with respect to negative afterthoughts following the expression of anger ($r = +.07$, n.s.).

Other results in Table 10 indicate that severe migraine Ss had a significantly greater tendency to report that getting angry gave them headaches than did severe tension headache Ss ($r = +.16$, $p < .05$). Thus it seemed possible that the migrainous subjects might just fear anger because it causes headaches. This hypothesis can be tested by examining the partial correlation between diagnostic category and fear of anger with the belief that anger causes headache held constant. This partial correlation is shown in Table 11. The correlation of migraine status with fears of expressing anger was found to be statistically significant after partialling, indicating

TABLE 11

RESULTS OF PARTIALLING REPORT OF 'ANGER GIVES HEADACHES' FROM 'FEARS OF EXPRESSING ANGER'

	$r_{migraine,\ fear\ of\ expressing\ anger}$	$r_{frequency\ and\ consulting\ Dr.\ partialled}$	$r_{anger\ gives\ headache\ partialled}$
Fear of expressing anger	.22**	.17*	.15*

*p < .05, r = .14; **p < .01, r = 18

that migrainous Ss' fear of expressing anger was not attributable to belief that anger caused their headaches.

It was also predicted in Part B that migrainous Ss would report more suspicion of other people and more trait anxiety than non-migrainous Ss. Table 10 shows that severe migraine Ss did report significantly more suspicion than severe tension headache Ss ($r = +.19$, $p < .01$), but did not differ significantly from severe tension headache Ss in regard to trait anxiety ($r = -.07$, n.s.).

In a final aspect of Hypothesis I, it was predicted that migrainous Ss would report their parents used child-rearing techniques that would encourage the repression of anger in children more often than would non-migrainous Ss. Table 10 shows that there were no

statistically significant differences between severe migraine and severe tension headache Ss in reports that parents threatened the loss of love as a disciplinary technique (r = +.09, n.s.). Fathers of severe migraine Ss were reported to threaten loss of love more frequently than did fathers of severe tension headache Ss, but this trend was not statistically significant (r = +.13, n.s.). Mothers of these Ss were reported to be virtually identical (r = +.01, ns.).

In summary, the results of the present study generally fail to support the hypothesis that migrainous Ss repress anger more than non-migrainous Ss (Hypothesis I). There is no support for the hypothesis that migrainous Ss express less anger than non-migrainous Ss (Part A). Although migrainous Ss were found to report significantly more suspicion and fears of expressing anger than non-migrainous people, there was other evidence to suggest that these two groups did not differ in respect to personality traits indicative of underlying repression of anger (Part B). Severe migraine and severe tension Ss did not differ significantly with respect to trait anxiety, negative afterthoughts, and parental withdrawal of affection.

It would be difficult to muster much support from this pattern of results for the hypothesis that migrainous people repress their anger more than non-migrainous people. By itself, the finding of greater fears of expressing anger and greater suspicion among

severe migraine Ss offers little to suggest that severe migraine Ss carry their fear to the point of repression. Since the differences were found in regard to conscious fears, suppression would seem to be the more likely expression of the fear. Moreover, differences in conscious fears of expressing anger offer little support for the repression model in view of the fact that the two groups were found not to differ significantly with respect to awareness of anger or expression of anger (Part A). If severe migraine Ss do repress their anger, one would expect them to have relatively low conscious awareness of anger. One might also expect Ss who repress their anger to show relatively little angry behavior. The present finding of no difference between groups on these dimensions disconfirms this prediction.

A closer inspection of the actual group differences with regard to fears of expressing anger and suspicion may help clarify their implications for the repression model. Figures 1 and 2 present a visualization of the response key for these clusters which contain the means and variances of the severe migraines and severe tension headache groups.

As can be seen, the actual overlap in response patterns of the two groups is quite large, and group differences are actually quie small. Although differences are large enough to be statistically significant, they are too small to have causal significance

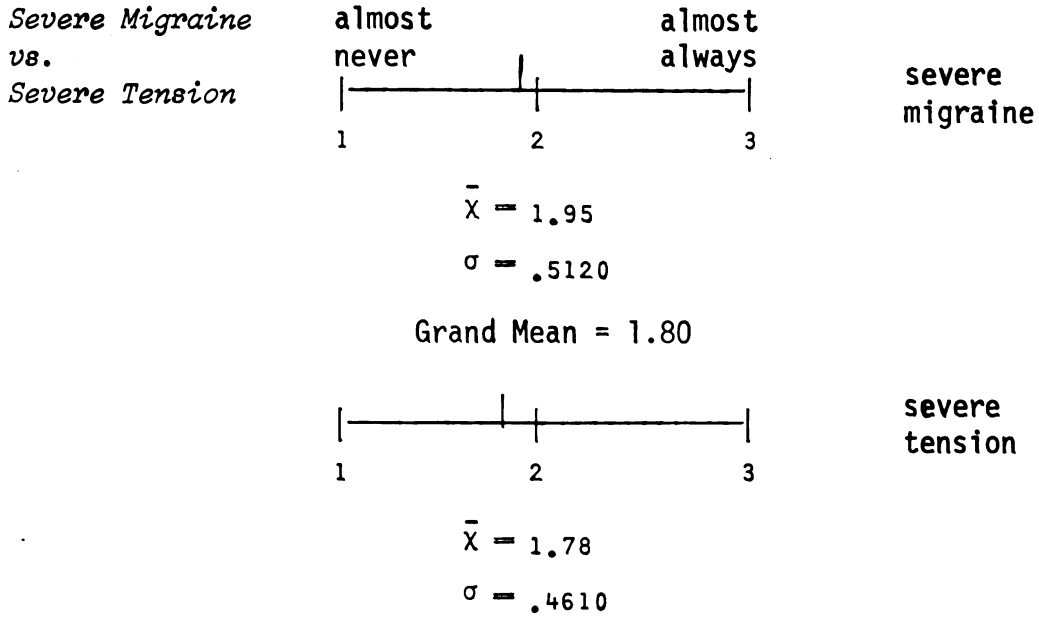

FIG. 1.--Differences between severe migraine and severe tension headache Ss in fears of expressing anger.

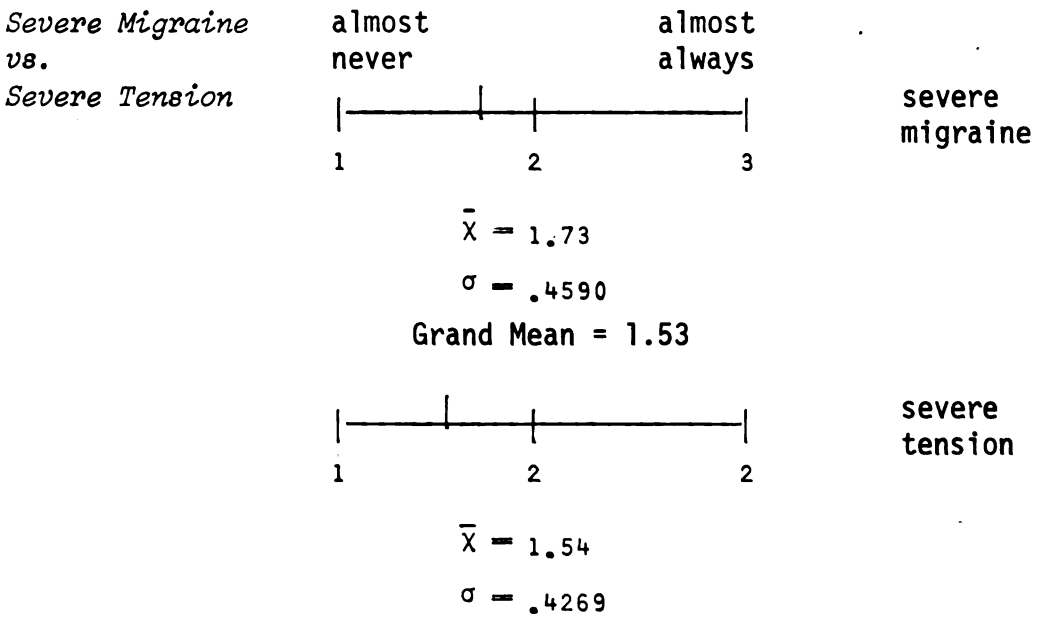

FIG 2.--Differences between severe migraine and severe tension headache Ss in suspicion of others

within the theoretical model. That is, it seems doubtful that such a small difference in fears of expressing anger and suspicion could lead migrainous people to run headlong into repressing their anger. Certainly severe migraine Ss do not appear to be highly fearful of expressing anger, or highly suspicious, in the absolute sense.

Fears of expressing anger and suspicion of others can have many sources, and as many impacts on personality. The meaning of the two statistically significant differences between severe migraine and severe tension Ss will be addressed further in the discussion section.

Hypothesis Two

Hypothesis II predicted that migrainous people have more traits which predispose them to getting angry than non-migrainous people. High resentment, high trait anxiety, high work endurance, strong parental attachment, and high rigidity of life style were traits of interest in regard to this hypothesis.

Table 10 shows no significant differences between severe migraine and severe tension headache Ss in regard to trait anxiety ($r = -.07$, n.s.), resentment ($r = +.03$, n.s.), or parental attachments ($r = +.13$, n.s.). Similarly, severe migraine and severe tension headache Ss did not differ significantly with respect to work endurance ($r = +.08$, n.s.) or rigidity of lifestyle ($r = -.07$, n.s.).

Thus, there was absolutely no support for the hyposthesis that migrainous people have more traits predisposing them to anger than non-migrainous people.

Hypothesis Three

Hypothesis III predicted that migrainous people have personality dynamics which would weaken their capacity to repress anger; for example, migrainous people might be pre-genitally fixated. If so, migrainous Ss should show the traits of high parental attachment, low self-revelation, few dating experiences, and low sexual experimentation. Table 10 shows that severe migraine and severe tension headache Ss did not differ with respect to self-revelation ($r = +.04$, n.s.). Severe migraine Ss did display a slightly greater tendency to report higher parental attachment, but this correlation was not significant ($r = +.13$, n.s.). The reader should note that the failure to reach statistical significance is not a function of small sample size, but rather, an expression of a very weak relationship. Figure 3 reveals there is very little between-group difference with respect to parental attachment.

A tiny difference between severe migraine and severe tension headache Ss was found on dating experiences ($r = +.13$, n.s.). However, the observed difference is in the direction opposite to that predicted;

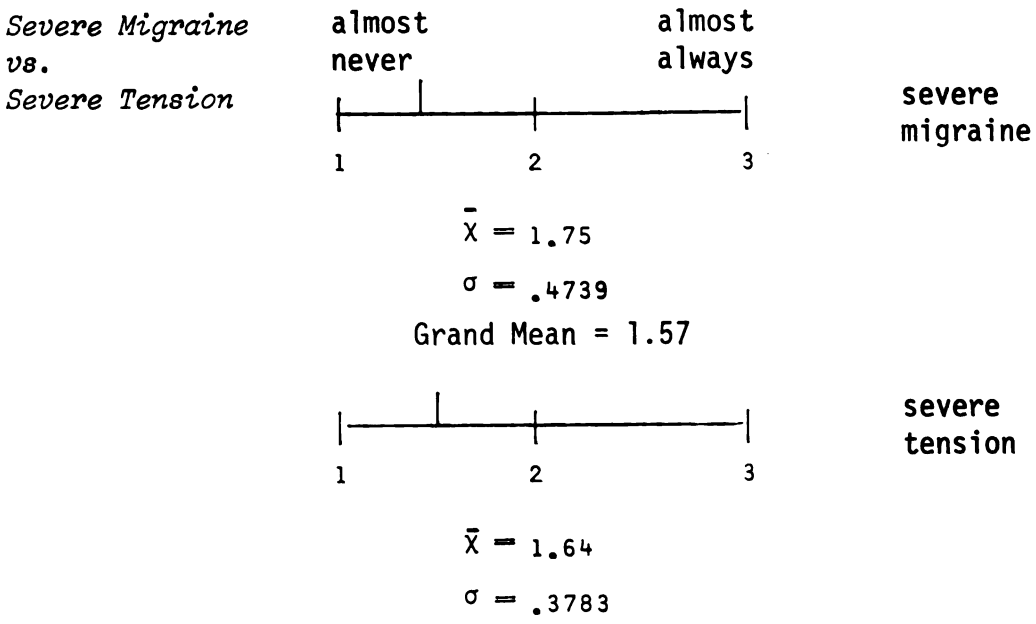

FIG. 3.--Differences between severe migraine and severe tension headache Ss in parental attachment.

severe migraine Ss reported slightly more dating experiences than severe tension headache Ss.

Differences in sexual experimentation are particularly important to the interpretation of pre-genital fixations. Table 10 shows no significant differences between severe migraine and severe tension headache Ss with regard to overall sexual experimentation ($r = +.03$, n.s.). Since the orgasmic capacity (particularly in women) is a very important aspect of sexual functioning, the data for male and female Ss were analyzed separately on each of the sub-items of the sexual experimentation scale. Table 12 shows no

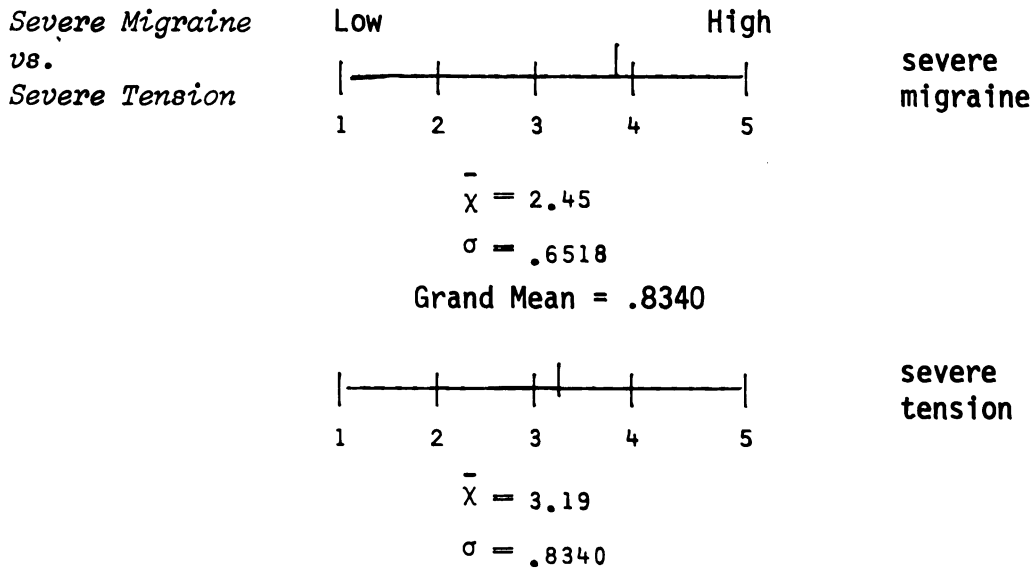

FIG. 4.--Differences between severe migraine and severe tension headache Ss in dating experience.

statistically significant differences between severe migraine and severe tension headache Ss for either males or females.

Hypothesis III predicted that migrainous people weakened their repressive competency through chronic overwork. Table 10 shows that severe migraine Ss do not differ significantly from severe tension headache Ss with respect to work endurance ($r = +.08$, n.s.).

Thus, results disconfirmed both aspects of the hypothesis that migrainous Ss have less capacity to repress anger than non-migrainous Ss (Hypothesis III). No significant differences were found between severe migraine and severe tension headache Ss in regard to indications of pre-genital fixations or overwork.

TABLE 12

SEXUAL EXPERIMENTATION AND ORGASMIC COMPETENCE IN SEVERE MIGRAINE AND SEVERE TENSION HEADACHE Ss

	Severe Migraine	Severe Tension	r
Females (N = 115) [p < .05, r=.18]	*(N = 47)*	*(N = 68)*	
Kissed and hugged	$\bar{X}$ = 0.106 s.d. = 0.312	$\bar{X}$ = 0.154 s.d. = 0.363	+ .07
Genitals fondled	$\bar{X}$ = 0.170 s.d. = 0.380	$\bar{X}$ = 0.212 s.d. = 0.412	+ .05
Had intercourse	$\bar{X}$ = 0.383 s.d. = 0.534	$\bar{X}$ = 0.387 s.d. = 0.490	+ .00
Orgasm during intercourse	$\bar{X}$ = 0.511 s.d. = 0.505	$\bar{X}$ = 0.612 s.d. = 0.626	+ .08
Males (N = 98) [p < .05, r = .20]	*(N = 18)*	*(N = 80)*	
Kissed and hugged	$\bar{X}$ = 0.00 s.d. = 0.00	$\bar{X}$ = 0.136 s.d. = 0.460	+ .13
Genitals fondled	$\bar{X}$ = 0.22 s.d. = 0.428	$\bar{X}$ = 0.212 s.d. - 0.412	- .01
Had intercourse	$\bar{X}$ = 0.389 s.d. = 0.502	$\bar{X}$ = 0.333 s.d. = 0.475	- .05
Orgasm during intercourse	$\bar{X}$ = 0.353 s.d. = 0.493	$\bar{X}$ = 0.379 s.d. = 0.489	+ .02

0 = yes; 1 = no

Summary of Hypothesis Testing

The results of the present study disconfirmed the hypotheses predicated on prior reports from psychotherapists treating migrainous people. By and large, very few personality differences were found between migrainous and non-migrainous Ss. Certainly no differences of any magnitude were observed. In particular, the results clearly disconfirm the hypothesis that migraine is produced by repressed anger.

Results Relevant to the Constitutional Model

Table 10 shows differences between groups with regard to causation of headache episodes. Severe migraine Ss were significantly more likely than severe tension headache Ss to report getting headaches from getting angry ($r = +.16$, $p < .05$), eating particular foods ($r = .21$, $p < .01$), and going on dates ($r = +.20$, $p < .01$). Severe migraine and severe tension headache Ss were found not to differ significantly in examinations being the cause of headaches ($r = +.06$, n.s.). The absolute size of the group differences is evident in Figures 5, 6, and 7.

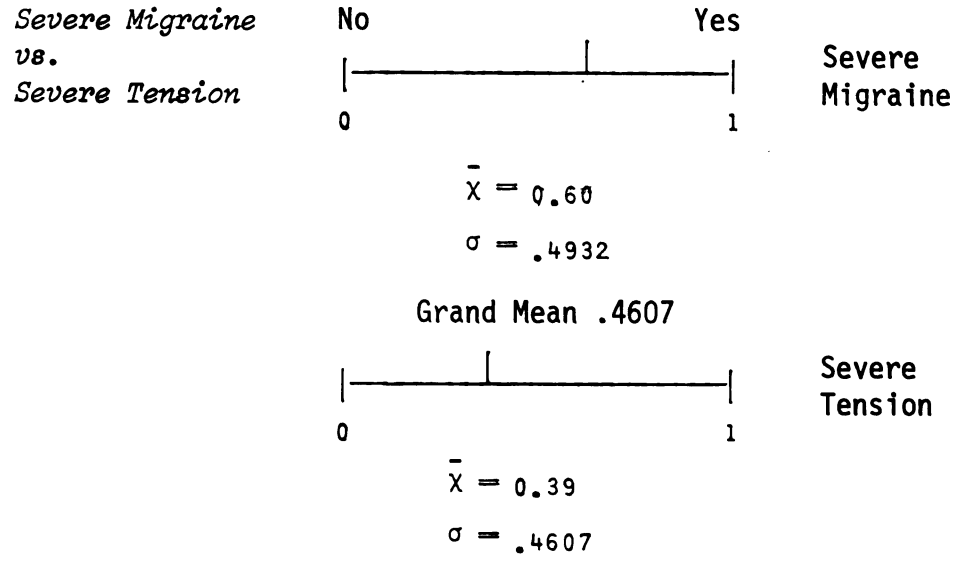

FIG. 5.--Differences between severe migraine and severe tension headache Ss in getting headaches from anger.

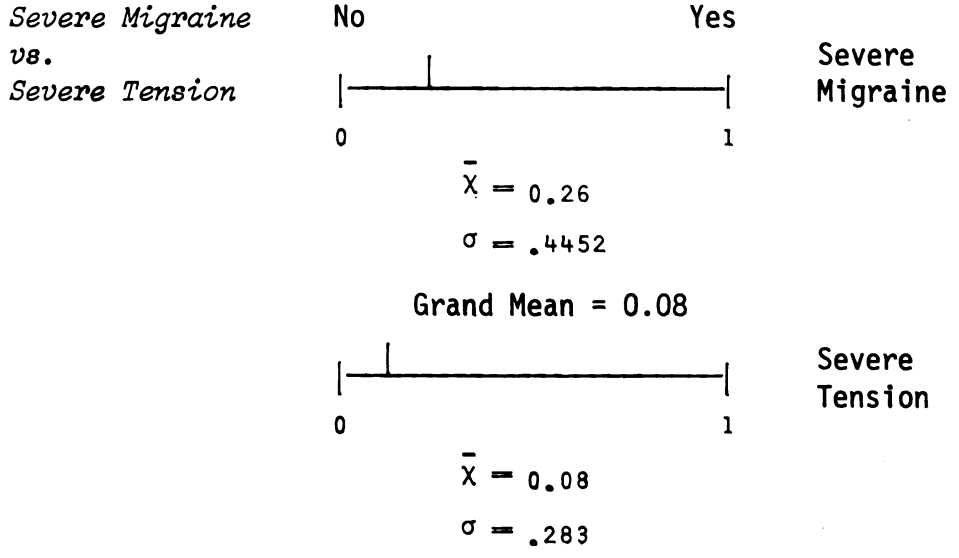

FIG. 6.--Differences between severe migraine and severe tension headache Ss in getting headaches from eating particular foods.

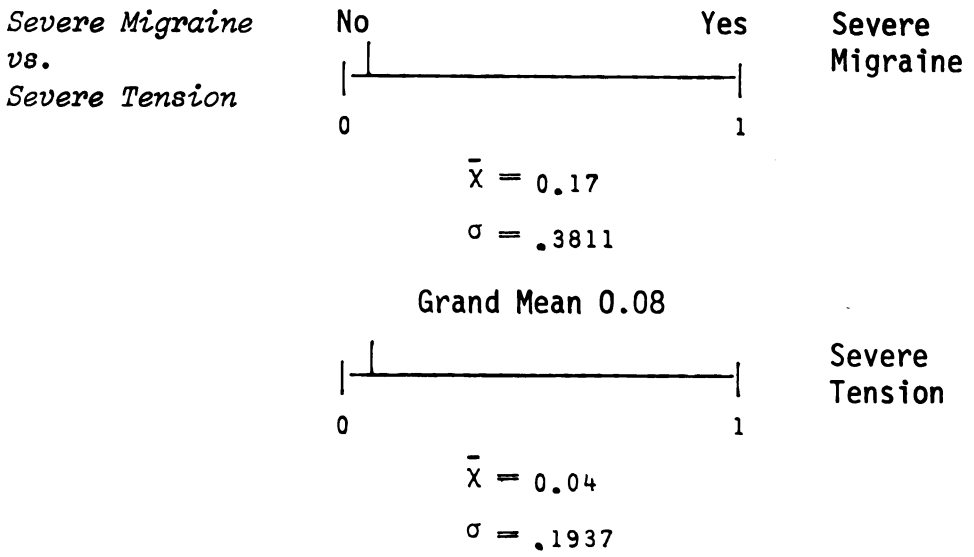

FIG. 7.--Differences between severe migraine and severe tension headache Ss in getting headaches from dating.

The information in Figures 5, 6 and 7 has relevance to the initial hypothesis (Hypothesis I) concerning differences in the handling of anger. Figure 5 indicates that 60 per cent of the severe migraine Ss report getting angry gives them a headache, while only 39 per cent of the severe tension Ss give similar report. In itself, this result indicates nothing about the role of repression of anger in migraine etiology. Indeed other findings argue against invoking the concept of repression to explain the between group-differences in anger creating headaches. However, anger may produce physiological changes capable of triggering headaches in people with predisposing physiology. That is, anger may

be a secondary cause of migraine. Dating and reactions to foods are even more closely associated causes of attacks in severe migraine Ss than is getting angry. These results are consistent with the constitutional model which hypothesizes that in a person who is genetically migrainous, anything that upsets the person to the extent that it upsets his body functioning will trigger a migraine attack.

There are other findings that support the constitutional model. This model does not predict that migrainous people will have specific personality traits. However, the constitutional model does suggest that among genetically predisposed people, individuals with more personal maladjustment will tend to have more attacks than similar people who are better adjusted. The relationship between personality and frequency of attacks, among all migraine Ss was examined. The results are presented in Table 13. Results indicated that migrainous Ss with relatively high frequency of attacks were found to differ significantly from low frequency migraine Ss in the following ways: more suspicion, more trait anxiety, lower self-esteem, more conscious anger from minor chance annoyances, lower sexual experimentation, and more headaches from taking examinations. To the degree that each of these traits is indicative of maladjustment, they tend to support the constitutional model. That is, each trait could trigger affective arousal in predisposed people, producing sufficient sympathetic

TABLE 13

PERSONALITY VARIABLES SIGNIFICANTLY CORRELATED WITH HIGH FREQUENCY OF ATTACKS IN MIGRAINOUS Ss (N = 90)

Personality Variable	$r_{Frequency\ of\ Headache}$	$r_{Corrected\ for\ Attenuation}$
Suspicion	.21*	26*
Trait anxiety (Negative indices)	.30**	.33**
Trait anxiety (Positive indices)	.25*	.29**
Trait anxiety (Total)	.32**	.35**
Sexual experience	-.20*	-.22*
Self-concept	-.23*	-.27**
Minor chance annoyances (Provocation)	.16	.24*
Self-opinionated people (Provocation)	.02	.03
Interpersonal encounters (Provocation)	.04	.05
Criticism (Provocation)	.02	.02
Total Provocation Score	.07	.08
Tell off (Verbal aggression)	.14	.17
Say nasty things (Verbal aggression)	.03	.03
Verbal Aggression Score	.09	.11
Hit things (Physical aggression)	.03	.03
Hit people (Physical aggression)	-.15	-.18
Physical Aggression Score	-.05	-.06
Mother discipline	.12	.13
Father discipline	.04	.04
Parental discipline (Total)	.09	.10
Negativism	.00	.00
Resentment	.01	.01
Fear of expressing anger	.13	.16
Negative afterthoughts	.05	.05
Parental attachment	.07	.05
Rigidity	.15	.18
Self-revelation	.01	.01
Work endurance	.09	.13
Dating experience	.15	.17
Morality	.03	.03

TABLE 13 (cont'd.)

Personality Variable	$r_{Frequency\ of\ Headache}$	$r_{Corrected\ for\ Attenuation}$
Exams give headaches	.32**	.32**
Anger gives headaches	.08	.08
Foods give headaches	.00	.00
Dating gives headaches	.08	.08

*p < .05, r = .20; **p < .01, r = .27

nervous system activity which exceeds the stability of the cerebral arteries to fluctuations in serotonin.

It was also noted that none of the anger-related scales, except 'minor chance annoyances,' differed between high and low frequency migraine sufferers. Not only did the general level of expression or provocation of anger fail to distinguish between migrainous and non-migrainous Ss, but anger also failed to distinguish high and low frequency migraine sufferers. This pattern was clearly contrary to psychodynamic models of migraine causation. Since the constitutional model does not specifically predict anger as a causal trait, the present findings do not have direct implications for this viewpoint. However, in view of the well-documented bio-physical changes associated with anger, this result was still surprising from the viewpoint of the constitutional model.

In summary, the present results suggested that anxiety may trigger frequent attacks in migrainous people. Although expression or provocation of anger was not generally associated with more frequent attacks in genetically predisposed people, people who encountered minor irritating events had more frequent migraine headaches.

Summary of Additional Findings

Two additional variables were examined (post-hoc) for their relation to the personality traits examined in the present study: headache severity and gender differences. The detailed report of these results is located in Appendix I. Only a brief summary of these findings will appear here.

Severity of Headache

Although this study was primarily concerned with the relation of migraine status with personality traits, it also seemed likely that severe headache (regardless of origin) could have an impact on personality. Thus, co-variation of headache severity with personality was examined. The data from all migraine and tension headache

Ss were combined, and analyzed along the dimension of severe headache vs. non-severe headache (without regard for headache type).

Results presented in Table 14 (Appendix I) indicated numerous significant personality differences between groups. Severe headache Ss were found to differ significantly from non-severe headache Ss on the following background variables:

greater frequency of headache ($r = .26$, $p < .001$)

greater history of consulting a doctor for headache treatment ($r = .33$, $p < .001$)

less general feeling of well-being ($r = -.10$, $p < .001$)

After the impact of these background differences was 'partialled out' severe headache Ss were still found to have higher scores than non-severe headache Ss on the following variables:

anger provoked ($r = .09$, $p < .01$)

verbal expression of anger ($r = .09$, $p < .01$)

physical expression of anger ($r = .09$, $p < .01$)

negative afterthoughts ($r = .06$, $p < .05$)

trait anxiety ($r = .10$, $p < .01$)

suspicion of others ($r = .09$, $p < .01$)

resentment of others ($r = .09$, $p < .01$)

rigid lifestyle ($r = .09$, $p < .01$)

sexual experience ($r = .10$, $p < .01$)

parental attachment ($r = .15$, $p < .001$)

mother used withdrawal of love as a disciplinary technique ($r = .14$, $p < .001$)

However, examination of the actual size of the corrections revealed that the magnitude of group differences was quite small. Thus, while severity of headache seemed to be related to several personality traits, the relationship was a rather weak one.

Sex Differences

The relationship of gender to personality traits was also examined, and results were presented in Table 15, (Appendix I). Female Ss were found to differ significantly from male Ss in having:

more frequent headaches ($r = -.15$, $p < .001$)

more severe headaches ($r = -.08$, $p < .05$)

more contact with doctors for headache treatment ($r = -.07$, $p < .05$).

After these background differences were 'partialled out', female Ss were still found to differ from male Ss with regard to:

more anger provoked ($r = -.12$, $p < .001$)

less anger expressed verbally ($r = +.12$, $p < .001$)

less anger expressed passive-aggressively ($r = +.11$, $p < .01$)

less acceptance of pre-marital sexuality ($r = -.22$, $p < .001$)

stronger parental attachment ($r = -.11$, $p < .01$)

more dating experience ($r = -.07$, $p < .05$)

more self-disclosure ($r = -.08$, $p < .05$)

less resentment of others ($r = +.07$, $p < .05$)

less suspicion of others ($r = +.06$, $p < .05$)

more feelings of general well-being ($r = -.08$, $p < .05$)

However, the reader is cautioned that these correlations are based on enormous sample sizes and thus, even though significant, the correlations are tiny in magnitude.

CHAPTER 7

DISCUSSION

Final Comments on the Data

The unusually high percentage of questionnaires returned by Ss deserves mention. The actual rate of return far exceeded all anticipation of this investigator, as well as the best estimates of veterans of questionnaire research. The high response rate tends to forestall any suggestion of systematic Ss selection bias in the present study.

Instrument Validity and Reliability

The reliability (alpha) of the various instruments was reported in Table 3 and varied from moderate (.44, minor chance annoyances) to high (.87, father discipline). Moreover, the scales used to evaluate the crucial first hypothesis of this study had the highest reliability. Thus, instrument reliability was not a major concern in the present study.

The issue of instrument validity was not so clear. Although attempts were made to use scales or items of demonstrated validity whenever possible, several instruments in the present study lack empirical validation. Conclusions based on the present results must be considered tentative until this supporting documentation is established.

However, considerable effort was devoted to developing instruments of high content validity. The reader can make an independent assessment of instrument content validity by examining Appendix D. High content validity was notably absent from many pre-existing scales, such as the Buss-Durkee Inventory. Scale items in the present study were also selected for their high degree of specificity and clarity.

It should be pointed out that the instruments used in the present study displayed good construct validity, in that they intercorrelate in ways consistent with theoretical expectations. Construct validity was examined in detail in Chapter Four.

Predictable variations in mean scores on the various scales also suggested the high validity of the instruments. Taking the Provocation scales as an example, Ss show high mean anger to highly provoking events (ex: interpersonal encounters) and low mean anger to minor chance annoyances.

The extremely large sample size of the present study required only a very weak relationship (small correlation) for results to be statistically significant. Any suggestion that 'invalidity' of the instruments was responsible for producing no significant differences in results would also involve postulating that all the scales were totally invalid. But since these questions have such high content validity, total invalidity is an entirely implausible hypothesis which must fly in the face of thousands of validation studies using similar but less carefully constructed scales.

Consideration of Social Desirability Effects

One particular form of scale invalidity is 'social desirability' effects. There is no evidence for such effects. In fact there is evidence to rule out the 'social desirability' hypothesis in the context of the present results. First, it was pointed out that the fact that migrainous Ss were found to be more suspicious than tension headache Ss required migrainous Ss to give responses that are 'socially undesirable' and present themselves in a negative light.

An examination of responses to the Provocation Scales adds further support against the 'social desirability' interpretation. Variations in mean group responses to the different provocation

scales were quite predictable: high anger reported for highly provoking events and low anger reported for low provoking events. More importantly, analysis of response frequencies to particular items in the provocation scales reveals that Ss did not refrain from reporting that certain events made them extremely angry. In regard to interpersonal encounters (the most provoking situations in the provocation scale), it was not uncommon for over 50 per cent of the migraine and tension headache groups to report that they were at least angry, and 20 per cent of these Ss reported being extremely angry. On the Verbal Aggression scale, almost 30 per cent of the migrainous Ss were willing to report that they usually made sarcastic remarks, and almost 20 per cent reported usually making nasty comments or belittling a person who made them angry. These patterns of responses hardly suggest Ss gave moderate or underrated self-reports to present themselves in a socially favorable light.

Migraine Incidence

The observed rate of migraine incidence among college students should be considered. On the surface, the finding of approximately three per cent migraine incidence might tend to cast doubt on the validity of using this data to examine the relationship of personality

to migraine. This relatively low incidence figure would suggest inaccuracies in the diagnosis and identification of migrainous Ss. However, the three to four per cent incidence figure, found to be stable across different college campuses, may be a reflection of the relatively young age (mean age 19-20 years) of these Ss. Consider that the peak years of migraine onset extend from late adolescence to the mid-20's. It is not surprising that migraine incidence among the college sample is only about half that observed among adults in the general population. Half of the prime years of migraine onset still lie ahead of the student group. Thus, three per cent migraine incidence among college students is not as deviant from past reports as it appears at first glance.

Use of College Students as Ss

In a very strict interpretation of the results, conclusions should be limited to the role of personality in the causation of headache in college students. Some readers may feel that college students are atypical and unrepresentative of the general population.

However, the college student group sampled was the closest match of all the groups to the general population sample (Meridian Mall group). Certainly the Michigan State University sample was a much better approximation of the general population than were the

patient populations. Moreover, the results of the studies by Henryk-Gutt and Rees (1973), Kidsson (1973), and Cochrane (1973) tend to support this. Finally, there is no tangible reason for suggesting that college students may differ from the general population in dimensions relevant to the current research. Thus, other readers may wish to draw broader conclusions about the role of personality in migraine causation in the general population.

Is it likely that the young age of the Ss in the present study had an impact on the observed results? If the psychodynamic model of migraine causation is true in its assertion that personality causes migraine, then two different possibilities must be considered. Following the logic of the psychodynamic model, students with the most repressive tendencies should have the earliest onset of migraine. Thus, students who have already developed migraine should show stronger personality traits than Ss who have later onset. A comparison of young migrainous and non-migrainous people should reveal more dramatic differences in personality than should a comparison of older adults.

On the other hand, correlations might tend to increase in an older sample, since Ss who had the migrainous personality dynamics and late onset of migraine would be correctly identified at a later date. At an earlier time, these Ss would be incorrectly identified

as non-migrainous. The variance of the non-migrainous groups would tend to diminish as the extreme personality scores of late onset migraine sufferers were drained away by later identification.

With these two opposite trends in mind, it seems doubtful that sampling an older population of Ss would reveal drastically different results. The young age of Ss in the present study would not seem to contribute to the failure of the results to support the psychoanalytic model of migraine causation.

Consideration of Psychodynamic Causation of Migraine

The implications of the present study for psychodynamic theories of migraine causation seem rather clear cut. Only two of the personality traits were found to differ significantly between migrainous and non-migrainous people. The two traits showing significant differences (suspicion, and fears of expressing anger) were, in themselves, rather trivial. The overall pattern of results disconfirmed every existing personality-oriented theory of migraine causation. In the case of some traits, such as dating behavior, trends were actually observed to lie in directions opposite those reported in Table One. It would be hard for any psychodynamic

theory to suggest causation of migraine based solely on suspicion of other people and fears of expressing anger.

These results contradict previous reports of personality traits in migrainous people, outlined in Table One. The disparity in results can be explained by the methodological flaws in previous studies outlined in Table One.

Impact of Methodological Flaws in Previous Research

As noted in Table One, sample selection bias permeated all previous investigations of personality characteristics of migrainous people, save one (Henryk-Gutt and Rees, 1973). Previous reports may have been accurate for the migraine patients sampled, but do not appear applicable to migraine sufferers in general. For example, migrainous people in psychotherapy may truly be more chronically tense than people who don't seek treatment. Migrainous psychotherapy patients may well be more embittered and resentful than non-migrainous non-patients. But this would also be true of non-migrainous people who seek therapy, and, thus, the alleged traits of migrainous persons may merely be the traits of patients in general.

Results in the present study confirm the hypothesis of sample selection bias in previous research. Sixty per cent of the migraine

sufferers in the present study never sought a headache treatment. Thus migraine patients are a selected subset of all migraine sufferers. Psychotherapy patient populations were twice as likely to complain of severe headaches or self-select into headache treatment as were non-psychotherapy patients. Migraine incidence was also found to be two to three times as great in psychotherapy populations as compared to non-patient populations.

Problems in Ss selection bias may have been compounded by other pervasive problems in previous research. Small samples used in many studies would tend to give more weight in the final results to idiosyncratic characteristics of individual Ss, and further predispose the sampling to be non-representative of migraine sufferers in general. The lack of control groups in previous studies precluded identification of the biased nature of the sample.

The pervasive absence of inter-rater reliability, standardized instruments, and control groups also probably accounts for some of the discrepancy between the present results and previous reports. For example, previous reports of sexual maladjustment among migrainous patients were made without control groups. Hence, it may be that investigators would have judged almost all of the general population in the 1930's to be sexually inhibited. In general, investigator biases may have colored both the therapist's observations of patients

and the interpretation of these observations. The strong theoretical commitment of these psychodynamically and psychoanalytically-oriented investigators makes the likelihood of interpretation bias rather great. The failure to use control groups and the total absence of statistic analysis of results provided no checks for errors in interpretation.

Consideration of Differences in Traits Assessed

Differences in results may be attributable to differences in the personality traits assessed. However, the dimensions assessed in the present study were identical to, or extremely similar to, those outlined in Table One. The only two exceptions to this were the assessment of perfectionism and tendencies to overwork. Both dimensions were approximated in the present study by an assessment of work endurance.

Since work endurance and perfectionism are probably not perfectly correlated dimensions, this may explain the difference in results. However, reports in the literature base their findings of perfectionism on the patient's self report of work endurance and attention to detail, with the former trait predominant. Thus, the

present findings regarding work endurance should have confirmed past reports of perfectionism had those reports been methodologically sound.

The method of case history examination may have introduced previous investigators' biases into their observations. Since judgments of perfectionism involved synthesis of several dimensions of data, low rater reliability and high subjectivity are suspect here. Furthermore, the alleged perfectipnism is an attribute of behavior that takes place outside the therapy room, and thus is entirely inferred from Ss' report. No doubt the basis for the interpretation of perfectionism varied widely from S to S, and study to study.

Predisposition to Confirm Previous Reports

In the case of traits of sexual inhibition, two factors in the present study actually increased the likelihood of finding significant differences between migrainous and non-migrainous people. One involved changing social norms, while the other involved using college students as Ss. If reports of pre-genital fixation were true, migrainous people in the 1970's should show low sexual experimentation like their counterparts in the 1930's while non-migrainous people in the 1970's might engage in more sexual experimentation with

less guilt than did mon-migrainous people in the 1930's. Since college students have been especially responsive to changes in sexual permissiveness, between-group differences should have been much larger in the present study than they might have been in the research of the 1930's.

Moreover, sexual intercourse is probably a better index of sexual interest among college students than it would be among married people. Married people are subject to more social, religious and legal pressures to partake in sex and hence show rather low variance on this dimension. However, sexual behavior of unmarried college students is much more closely correlated with actual sexual interest and hence more able to reflect differences between migrainous and non-migrainous people, had they existed. However, migrainous and non-migrainous Ss did not differ significantly in sexual experiences at their present stage of development, and it is doubtful that differences between groups would increase with age.

Consideration of Recent Studies

As indicated in Table One, the more recent studies of Bihldorf (et al., 1971), and Henryk-Gutt and Rees (1973) were more sophisticated than previous investigations. Methodologies were more similar to that used in the present investigation. Hence the results

of these studies could not merely be dismissed by consideration of the more common methodological flaws.

Many previous investigators have adopted strategies of interpreting their results which maximize the likelihood of capitalizing on chance outcome of the data. A finding of significance does not establish the validity of any given interpretation; it merely states that differences of the observed size would occur only one in twenty times by chance (.05 level of significance). If twenty significance tests are run, then it is very likely that at least one of the 'significant' findings is a chance difference. Thus, to say that a multivariate study found significant difference is to say little. The questions are: were there more significant results than would be expected by chance, and did the significant and non-significant differences occur along the predicted lines?

In the present study, nine correlations above r = .10 were observed between migraine status and personality, where eight correlations of this size would be expected by chance.

Consider then the strategy employed by Bihldorf (et al., 1971). These authors discussed only the significant results and ignored those which were not significant. They made no check for the consistency of their findings. If one item concerning anger is significant while five other items are not significant, then it is

likely that the lone item was significant by chance. Interpretation of the results must include the results of all tests. Interpreting one statistically significant difference in the absence of the other related findings increases the likelihood of drawing a theoretical conclusion which the data does not actually support. It is with this orientation that the findings of the present study will be interpreted.

Furthermore the data reported by Bihldorf et al. (1971) presented in Appendix E shows that the actual source of significant differences in each test was the difference between headache and no-headache groups. In no case was the major difference that between migraine and tension headache Ss or that between migraine and control Ss.

Results in the present study show that severe migraine and severe tension headache Ss do not differ significantly in expressing anger or guilt following the expression of anger. Thus, while the results of the present study do not support the conclusions of Bihldorf et al. (1971) they are consistent with the actual results of the Bihldorf study.

The results of the present study are consistent with those reported by Henryk-Gutt and Rees (1973). They found no significant difference between migraine and tension headache Ss in hostile

behavior. While it is possible that their finding reflected deficiencies in the Buss-Durkey Hostility Inventory (1957), the improved instrument used in the present study yielded similar results. Both studies also show that migrainous and non-migrainous people do not differ significantly in guilt following the expression of anger.

In conclusion, the results of the present study show no significant personality differences between migrainous and non-migrainous people. This is consistent with the more methodologically sound studies of the recent past. Present results tend to conflict with earlier studies, whose results are suspect because of several sources of bias and distortion.

Explanation of the Two Personality Differences Found in the Present Study

What is the meaning of the finding that migrainous Ss are significantly more suspicious and afraid of expressing anger than non-migrainous Ss? Examination of the item content of the suspicion scale suggests that many migrainous Ss believe that other people are less truthful and less friendly than they appear to be on the surface. Similarly, migrainous Ss' fear of expressing anger reflects a strong expectation of negative or rejecting reactions from other people.

As a whole, these results indicate that migrainous Ss are more likely to feel that interpersonal relationships are dishonest and more tenuous.

Typically explanations of such a difference in expectations would be psychodynamic. Significant differences in regard to self-concept, trait anxiety, or withdrawal of parental affection would have been inferred. However, significant differences between migrainous and non-migrainous Ss were not found on these dimensions. Furthermore, this difference in the perception of social relationships had no impact on their dating behavior, self-revelation, or sexual experimentation.

Perhaps suspicion and fears of expressing anger result from the symptomatology of migraine itself. Migraine symptoms may appear repulsive or strange to other people. If new acquaintances make overtures of friendliness and then pull back, migrainous Ss could respond with future suspicion of honesty and friendliness. Moreover, they may fear placing additional strain on the relationship by expressing anger. Yet if this explanation were true, then repeated occurrences of rejection should have further impact on personality. Migrainous Ss might develop feelings of poor self-concept, or high trait anxiety, or refrain from dating. However, there are no such indications in the results of the present study.

Migraine symptomatology may have impact in another way. When a migraine attack occurs, a migrainous person will have to cancel plans made with friends. Most people understand that a 'migraine' is a terrible headache and would be sympathetic about canceling pre-arranged plans. However, migrainous Ss may feel guilty for disappointing their friends. Migrainous Ss may believe that their friends suffer more disappointment than they express. Thus, migrainous people may doubt the disclaimers of their friends. These events would leave migrainous Ss feeling suspicious of other people's honesty or friendliness. Their guilt would make the relationship seem tenuous and the expression of anger relatively more fearful. However, since the rejection is not real, the migrainous person will not suffer the actual effects of rejection such as loss in self-esteem or problems in dating, etc.

Consideration of the Psychoanalytic Model of Migraine Causation

How are the findings of the present study relevant to the concept of repression? This is an important question, since repression was not measured directly. First, consider that repression is a theoretical construct, which must be operationalized along some

methodological framework if it is to be examined. Since repression cannot be directly measured, the concept can be examined only by observing whether the data satisfy predictions generated by a specific theory of repression.

The concept of repression is invoked by a psychotherapist when he feels that his client is angry about something but there is no overt expression of that anger. That is, repression is usually operationalized as 'anger that should be evident in behavior but is not.' Thus, the first step in inferring the existence of repression is to assess the frequency of overt angry behavior. To allow for individual differences in style of anger expression, three different modes of overt anger-expressive behavior were examined in the present study. No significant differences were found between reports of migrainous and non-migrainous Ss on any of these modes of angry behavior.

The next step in inferring repression is to assess the amount of anger the person subjectively experiences in everyday life. Since the theoretical function of repressive defenses is to remove threatening or unacceptable impulses and feelings from conscious awareness, people who repress anger should report a lower awareness of feeling angry in response to a given set of anger-provoking situations than people who do not repress anger.

Low provocation scores and low angry behavior do not indicate repression in themselves. These two results could also be interpreted to mean that people demonstrating these traits actually didn't get angry, and thus had relatively little anger to express. To infer the existence of repression, other variables must be considered. Fear of expressing anger is one such "third variable." Within the psychoanalytic concept of repression, some derivative of the repressed conflictual material is hypothesized to reach consciousness. Fears of expressing anger would be one possible derivative of repressed anger and trait anxiety would be another. Fear of expressing anger by itself does not indicate repression. However, a profile of low provocation scores, low angry behavior, and high fears of expressing anger would be suggestive of underlying repression. A profile of high provocation scores, low angry behavior, and high fears of expressing anger would be more suggestive of suppression of anger.

Results of the present study cast doubt on the validity of the psychoanalytic model of migraine causation. No support for the hypothesis that repression of anger causes migraine was observed. The 'economic model' of psychic energy was of little utility in explaining differences in migraine status. Moreover no evidence was found that migrainous people are more predisposed to anger than non-migrainous people.

One might question whether or not these results simply reflect a "failure to find" significant differences between migrainous and non-migrainous Ss that indeed exist in personality. However, one would be hard pressed to suggest a rationale to support this.

This study has attempted to take a series of personality scales and use them in an integrated way to assess the likelihood that a dynamic psychological process (ie: repression) occurs in some people more often than others. However, the reader's acceptance of this rationale will no doubt determine the extent to which generalizations are truly accepted from this research. Readers who accept this attempt at operationalizing a psychic process, and assessing the likelihood of its differential operation, will conclude from the present research that repression of anger does not cause migraine. However, readers who feel that patterns of personality traits cannot be used to assess theoretical dynamic processes will probably limit their conclusions to the interpretation that there is not support for reports of generic personality traits in migrainous people.

Readers in the latter category may argue that psychoanalytic formulations cannot be tested by non-analytic methods. Opponents would quickly counter that psychoanalysis is thus untestable by conventionally prescribed and accepted scientific methods, and thus, is worthless because it is a theory that is incapable of verification

by non-biased investigators. This controversy has raged for years, and no doubt will continue beyond this or any study.

However, readers of more moderate bent may agree with this author that there is some value in operationalizing, albeit perhaps imperfectly, the process of repression and examining the resultant data to see if it is consistent with the theoretical operations and effects of repression as suggested by the psychoanalytic model. Some readers may feel that this is an 'imperfect' test of the psychoanalytic model of migraine causation, and no doubt the label 'imperfect' is accurate. However, 'imperfect' is a long way, in this case, from 'valueless,' and it would be a great mistake to avoid the implications of the present study for the psychoanalytic model. Moreover, the present findings are extremely relevant to a consideration of the practice and theoretical framework of psychoanalysts in the treatment of migraine and the training of medical students in this regard. The alternative seems to be to learn nothing new about the validity and utility of the psychoanalytical model of migraine, for want of methodological over-kill.

Consideration of the Constitutional Model

The constitutional model assumes that a genetic hypersensitivity of the cranial arteries to serotonin fluctuations is the underlying variable distinguishing migrainous and non-migrainous people. This variable was not examined in the present study.

The constitutional model does not offer specific predictions of personality differences between migrainous and non-migrainous people. The unique characteristics of each genetically predisposed individual is suggested to determine which emotions will be volatile enough to trigger an attack. The constitutional model does predict that within the population of genotypic migrainous people, those least emotionally adjusted will suffer more migraine headaches. The finding that migrainous Ss with higher frequency of attacks are significantly more suspicious and have significantly higher trait anxiety and significantly lower self-concept than migrainous Ss with low frequency of headaches supports this prediction. The finding that high-frequency migrainous Ss report significantly more anger from minor chance annoyances than low-frequency migrainous Ss adds further support.

The finding that high-frequency migrainous Ss report significantly more headaches from taking examinations, and report significantly less sexual experimentation than low-frequency migrainous Ss

is further support for the constitutional model. College students with the migraine genetics and conflicts over sexuality and taking exams would be living in an environment that would give them relatively frequent attacks. It should be noted that these correlations, which are consistent with the constitutional model, were also the largest correlations observed in the study when migraine status was considered.

The finding that high-frequency migrainous Ss report more conscious anger from minor chance annoyances than low-frequency migraine Ss tends to further undermine confidence in the repression model of migraine. Within the repression model, a migraine attack occurs when the repressed anger starts to reach consciousness in order to block the awareness of anger. Migraine occurs prior to the awareness of anger because the attack is a symbolic sublimation of the anger, the denial of the anger and unconscious punishment. Results indicated high frequency of attacks to be correlated with higher awareness of anger, whereas the repression model would have predicted high repression and hence low awareness to be correlated with high frequency of attacks.

The finding that migrainous Ss are more likely to report headaches from getting angry than non-migrainous Ss is consistent with the constitutional model. The constitutional model predicts

causation from emotional and non-emotional reactions, alike. Thus, the constitutional model is also consistent with the additional findings that migrainous Ss are also more likely to report headaches from eating particular food or going on dates than non-migrainous Ss. In contrast, the repression model cannot explain the finding of food causing more headaches in migrainous Ss than in non-migrainous Ss.

It is not possible to "disprove" any theory by the use of statistical tests. However, the utility of a theory can be evaluated in terms of how well it accounts for relevant research data. In this regard, the constitutional model is more congruent with the results of the present study than is the psychoanalytic model of migraine.

In all fairness, the present study was designed to look at critical aspects of the psychoanalytic model, but not those of the constitutional model. Only a study of people with evidence of familial transmission of migraine could do that. Even then, the possibility of 'learned symptoms' within the family dynamics would have to be ruled out.

Relation of Personality and Headache Severity

Previous investigators failed to utilize control groups and hence they may have been observing personality concommitants of severe headache rather than those of migraine per se. Thus, it was of interest to see if previous reported characteristics were true of all severe headache Ss compared with Ss with mild headache.

Severe headache Ss were found to differ significantly from mild headache Ss in regard to having more negative afterthoughts following the expression of anger ($r = .06$, $p < .05$), stronger parental attachments ($r = .15$, $p < .001$), more trait anxiety ($r = .10$, $p < .01$), more resentment ($4 = .11$, $p < .01$) more suspicion ($r = .09$, $p < .01$), more rigid lifestyles ($r = .09$, $p < .01$), and were significantly more likely to have had a mother who used withdrawal of love as punishment ($r = .14$, $p < .001$). Differences found between severe and non-severe headache Ss in the present study are more congruent with these earlier reports of "migraine traits' than are the findings regarding migrainous and non-migrainous Ss.

However, other results failed to support this interpretation. Ss with severe headache were also found to have significantly greater awareness of anger when provoked, to express more anger, and to have significantly more sexual experience than non-severe headache Ss.

These latter characteristics are directly opposite those reported in the literature for migrainous people. Thus, consideration of the absence of control groups in previous research could still not explain differences between these reports and the present study.

Severe headache Ss suffered significantly more attacks than non-severe headache Ss from getting angry, eating particular foods, and going on dates. This may indicate that Ss with severe headaches tend to be more "reactive" to these stimuli. Severe headache Ss expressed significantly more anger than non-severe headache Ss by hitting things, hitting people, and saying nasty things. It may be that getting more "worked up" and violent in the expression of anger creates more severe headaches.

Alternatively, two other interpretations should be considered. It could be that the onset of severe headache is more sharply defined than onset of non-severe headaches, calling greater attention to the events immediately preceding the attack. Thus, severe headache Ss would report more specific events triggered their attacks, whereas non-severe headache Ss would see preceding events on a more random basis. If so, then Ss with severe headaches would be more likely to report that anything gives them attacks. However, the finding that severe and non-severe headache Ss do not differ significantly

with respect to examinations causing headaches is not consistent with this interpretation.

It is not possible to make any broad generalizations about how personality determines headache severity. Correlations do not indicate causal relationships in themselves. It is not clear whether the observed personality traits cause severe headache, or if these traits result from them. It is possible that high trait anxiety, strong resentment, or extreme irritability could predispose a person to severe headaches. On the other hand, one could conclude that any of these traits could develop as a result of severe headaches.

It is possible to draw one causal inference from the results with some certainty, due to the time sequencing implied in the questionnaire scale. It seems that mothers who use withdrawal of affection as a disciplinary technique tend to raise children who are more prone to severe headaches. The remaining correlations are too small to warrant further interpretation.

The Clinical Treatment Fallacy

It was mentioned earlier that high-frequency migrainous Ss differed significantly from low-frequency migraine Ss on several traits that had been previously reported in the literature as

specific characteristics of migrainous people, per se. This finding supported assertions that Ss selection bias was a likely problem in past research. Research conducted on populations of migraine sufferers seeking treatment was predisposed to conclude that migrainous people, in general, had the above traits. Moreover, the failure to utilize control groups of non-migrainous people predisposed these investigations to conclude that these traits caused migraine.

It is fallacious to assume that the personality dynamics observed in clinical treatment populations can be generalized into causal theories of migraine etiology for all migraine sufferers. The tendency to ignore this can be termed the "clinical treatment fallacy" of theory-building.

There are several other indications to support the idea that the clinical treatment fallacy was operating in previous reports. Only 43 percent of all migrainous Ss in the M.S.U. sample, and 71 per cent of migrainous Ss in the shopping mall sample have ever consulted a doctor for headache treatment. Certainly an even smaller percentage of these migraine sufferers have consulted a psychotherapist. Psychotherapists see a rather small percentage of all migraine sufferers.

The people that therapists see in treatment seem to differ from non-patients. Psychotherapy patients in the present study were

twice as likely to seek headache treatment as were non-patients. Moreover, Ss in the community mental health center sample were over twice as likely to report their headaches were severe or unbearable as Ss in the shopping mall sample.

These results may suggest that psychotherapy patients have more severe headaches than non-patients, which leads them to seek headache treatment more often. On the other hand, it may indicate that psychotherapy patients are more dependent and hypochondrical than people who don't seek psychotherapy. In either event, it would seem that there are relevant differences between psychotherapy patients and the general population.

It may be that the variable of "seeking psychotherapy" is a stronger co-variate of personality than is migraine headache. The small correlations between migraine status and personality tend to support this assertion. Epidemiological studies involving random selection of Ss are required in areas, such as migraine, where personality is suggested to cause certain disorders. This methodology would be particularly appropriate to apply to other "psychosomatic" ailments. Where this has been done, the results have been quite similar to those of the present study (Kidson, 1973; Cochrane, 1973).

However, this does not rule out the possibility that the early clinical studies may have reported valid findings for their

particular group of highly select Ss. The present study detected the same personality traits in migrainous and non-migrainous people. There is no reason to suspect that migrainous people are any more or less psychologically adjusted than non-migrainous people. There will no doubt be groups of migrainous people with the same psychopathology as non-migrainous people. Thus, analysts' reports of personality traits in migrainous psychotherapy patients may have been true, but causal statements are purely inference and speculation.

Previous studies may have simply fallen into the pitfall of the clinical treatment fallacy. It would be a similar error to argue from the present data that migrainous Ss in the early studies did not repress anger. It is sufficient to point out that methodological flaws must be considered when interpretations of psychotherapy sessions are examined as a form of research.

Implications for Treatment

This study has some very practical implications for migraine treatment. No extreme personality traits were found among migrainous persons. Moreover, the central aspects of the psychoanalytic model of migraine causation (repression of anger) were disconfirmed.

Thus, this study challenges the utility and wisdom of prescribing personality-based treatment as the primary therapeutic intervention for migraine. Present findings, supportive of the consitutional model, suggest that psychotherapy does not deal with the primary cause of migraine; i.e. the genetic predisposition. Contrary to the opinions of therapists engaged in migraine treatment, chemotherapy (ex: ergotamine tartrate) is not a "crutch" or an "inadequate substitute for deep psychotherapy." Perhaps this is why psychoanalytically-oriented treatment for migraine has failed to produce notable success.

On the other hand, significant relationships within migrainous Ss between frequency of attacks and certain personality traits provide some support for limited use of psychotherapy. What psychotherapy might do is to help establish adjustment and lower the emotional reactivity of the predisposed individual and avoid triggering an attack. Psychotherapy aimed at "de-repression" seems useless and unwarranted. Results suggest that treatment would be better off to focus on anxiety.

Theoretically, the low observed correlations of migraine with personality represents a low and definite upper boundary on the potential impact of psychotherapy in migraine reduction. Psychotherapists should not expect dramatic results in treatment, and the

results of this study tend to explain why such results have not been forthcoming in 40 years of practice.

Results of the present study suggest that exploration of non-personality-oriented forms of therapy would be profitable. Increasing experimentation in bio-feedback training of migraine sufferers to control their vascular motility would seem one direction for future treatment efforts to take.

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APPENDICES

APPENDIX A

PERSONALITY QUESTIONNAIRE AND

BACKGROUND INFORMATION

Headache Response Questionnaire II

DIRECTIONS: Please Read Carefully!

Mark your responses to this questionnaire on the enclosed blue response sheet. Please use pencil as this sheet will be scanned by machine.

Each section of this questionnaire is preceded by a response key. Read this key first. Then respond to the items in that section using that key.

Please be sure that the item number for each question is the same as the number of the box you mark on the response sheet.

Do not enter your name or student number anywhere on the response sheet.

Place the response sheet in the return envelope provided, seal it, and drop it into the campus mail.

Thank you.

Statements 1 thru 15 refer to things and experiences that sometimes get people angry. On the seperate answer sheet, fill in the column that best describes how much each item gets you angry:

1. NOT AT ALL ANNOYED
2. A LITTLE ANNOYED
3. QUITE ANNOYED BUT NOT REALLY ANGRY
4. ANGRY
5. VERY ANGRY

1. Finding out about something you would have liked to see, after you leave a place.
2. People taking advantage of you.
3. People who brag about things.
4. Waiting for someone who is late or doesn't show up.
5. Criticism.
6. People acting as though you are stupid.
7. Having to do something else when you are in a hurry.
8. People who think they know it all.
9. Being ignored by someone.
10. People being sarcastic towards you.
11. Finding someone has lied to you.
12. Being interrupted.
13. People who think they are always right.
14. Being teased about your faults.
15. Lazy people who won't do their share.

GO ON TO NEXT PAGE

Listed below are a number of self-descriptive statements. Read each one and decide how the statement applies to you. Mark your answer in the appropriate column of the answer sheet:

1. ALMOST NEVER TRUE OF ME.
2. SOMETIMES TRUE OF ME.
3. ALMOST ALWAYS TRUE OF ME.

16. When someone makes me mad, I am apt to say something to insult that person.
17. I like the idea of having my meals at odd hours, and going to bed when the mood strikes me.
18. When I am angry at someone, I won't do what they ask me to.
19. I am on my guard with people who are somewhat more friendly than I expected.
20. When I am mad, I slam doors.
21. Sometimes I don't think I could cope with my parents dying.
22. I feel unable to tell anyone all about myself.
23. When I am angry at someone, I make sarcastic remarks to them.
24. I am satisfied with myself as a person.
25. I am bitter about not getting what is coming to me.
26. When I show my anger at someone, I can't stop thinking that I shouldn't have.
27. I wonder what hidden reason another person may have for doing something nice for me.
28. I get so angry, I pick up the nearest thing and break it.
29. I find it easy to stick to a certain schedule, once I have started it.
30. If someone makes me mad, I tell them off.
31. I am just as nice as I should be.
32. I keep at a job until it is finished.

GO ON TO NEXT PAGE

Listed below are a number of self-descriptive statements. Read each one and decide how the statement applies to you. Mark your answer in the appropriate column of the answer sheet:

1. ALMOST NEVER TRUE OF ME
2. SOMETIMES TRUE OF ME
3. ALMOST ALWAYS TRUE OF ME

33. I show my anger by banging on the table.
34. I think people rarely tell the truth.
35. When I express my anger, I am afraid that something bad will happen to me.
36. I worry about my parents being unhappy.
37. When I get mad I say nasty things.
38. I do dangerous things just for the thrill of it.
39. When I express my anger, I feel afterwards that I was wrong.
40. When I am angry at somebody who asks me to do something, I will say "yes" but put it off indefinitely.
41. I throw things when I get mad.
42. I think people rarely tell the truth.
43. I have a hard time being away from my parents.
44. After I express my anger, I wonder if I was justified.
45. I will say things to put a person down if they make me angry.
46. It makes me mad when I see other people getting things they don't deserve.
47. I take my anger out on non-living things.
48. I feel uneasy when my anger at somebody shows.
49. I reveal my deepest feelings to my friends.
50. Sudden unexpected changes in plans make me uncomfortable.
51. It's never safe to take what other people say at face value.
52. I don't tell people off, even if they deserve it.

Listed below are a number of self-descriptive statements. Read each one and decide how the statement applies to you. Mark your answer in the appropriate column of the answer sheet:

1. ALMOST NEVER TRUE OF ME.
2. SOMETIMES TRUE OF ME.
3. ALMOST ALWAYS TRUE OF ME.

53. I often put in long hours of work without taking a break.
54. If someone is important to me, it is easy for me to let them know it.
55. When I am angry I hit walls.
56. I despise myself.
57. I feel I will never be as close to anyone as I am to my parents.
58. No matter how angry I get, I don't say anything to the other person.
59. I am as smart as I want to be.
60. I don't like to change plans in the middle of an undertaking.
61. When I really lose my temper, I am capable of slapping someone.
62. When I look back on what's happened to me, I can't help feeling mildly resentful.
63. I worry that people won't like me if I express my anger.
64. I like a great deal of variety in my life.
65. When I show my anger in a situation, I feel afterwards that I had every reason to do so.
66. If I am pushed too far, I will hit a person.
67. When I show I am angry, I often regret it afterwards.
68. I would rather stay up late working in order to get a job done, than put it off until the next day.
69. I am not the person I would like to be.
70. It's easy for me to express my anger the way I would really like to.
71. When I am angry at somebody, I do the opposite of whatever they ask.

For the following questions (72 - 75), a DATE is defined as: A PREARRANGED PERIOD OF TIME TWO PEOPLE OF THE OPPOSITE SEX SPEND TOGETHER AS A COUPLE. Unanticipated visits, or group activites in which the expectation of going as a couple was not established prior, are not considered dates. Under this definition, 2 people living together could still 'date' each other.

72. How many real dates have you had?

1. none
2. one
3. 2 to 5
4. 6 to 14
5. 15 or more

73. What is your average rate of dating?

1. never dated
2. have not dated in the last year
3. one or more dates a year, but less than an average of one a month
4. one or more dates a month, but less than an average of one a week
5. one or more dates a week

74. What is your emotional commitment to the person(s) you are dating?

1. not dating
2. dating but no emotional commitment
3. date only each other
4. engaged
5. married or living together as a couple

75. How many times have you shared a relationship with a person of the opposite sex, in which you both agreed to date only each other?

1. never
2. once
3. twice
4. three times
5. four or more times

GO ON TO NEXT PAGE

A number of statements which people have used to describe themselves are given below (76 - 85). Read each statement and fill in the proper column on the answer sheet to indicate how you generally feel. There are no right or wrong answers. Do not spend too much time on any one statement, but give the answer that seems to describe how you generally feel:

1. ALMOST NEVER
2. SOMETIMES
3. OFTEN
4. ALMOST ALWAYS

76. I feel pleasant.
77. I feel that difficulties are piling up so that I cannot overcome them.
78. I am cool, calm, and collected.
79. I worry too much over something that really doesn't matter.
80. I am happy.
81. I feel secure.
82. Some unimportant thought runs through my mind and bothers me.
83. I am content.
84. I take disappointments so keenly that I can't put them out of my mind.
85. I become tense and upset when I think about my present concerns.

The following questions (86 - 90) concern some of your attitudes regarding courtship behavior. We realize that you may be tolerant of what others do and think, but we are interested in your own personal views about the questions below. These questions do not concern what you do - they concern what you believe about courtship.

1. AGREE STRONGLY
2. AGREE SLIGHTLY
3. UNDECIDED OR NO OPINION
4. DISAGREE SLIGHTLY
5. DISAGREE STRONGLY

86. Petting is acceptable before marriage for a person of my sex, if the person is engaged to be married.
87. Petting is acceptable before marriage for a person of my sex, if they like their partner (but don't necessarily love them).
88. Full sexual relations are acceptable before marriage for a person of my sex, if they are engaged to be married.
89. Full sexual relations are acceptable before marriage for a person of my sex, if they like their partner (but don't necessarily love them).
90. Full sexual relations are acceptable before marriage for a person of my sex, even if they don't feel a strong liking towards their partner.

GO ON TO NEXT PAGE

Have you had any of the following experiences? Enter your answer on the answer sheet by marking the appropriate column:

1. YES
2. NO

91. Kissed and hugged continuously for an hour.
92. Had your genitals fondled by a person of the opposite sex.
93. Had sexual intercourse.
94. Had orgasm during intercourse.

95. What is your sexual orientation?
    1. heterosexual
    2. homosexual
    3. bisexual

The following statements (96 - 103) mention ways parents sometimes react. Read each one and decide how it relates to the way your parents characteristically reacted to you before the time you were twelve years old.

1. ALMOST NEVER TRUE OF MY PARENT
2. SOMETIMES TRUE OF MY PARENT
3. ALMOST ALWAYS TRUE OF MY PARENT
4. PARENT DECEASED OR ABSENT DURING MY CHILDHOOD

96. My mother avoided looking at me when I disappointed her.
97. My father avoided looking at me when I disappointed him.
98. Sometimes when she disapproved, my mother didn't say anything but was cold and distant for awhile.
99. Sometimes when he disapproved, my father didn't say anything but was cold and distant for awhile.
100. When I hurt her feelings, my mother stopped talking to me until I pleased her again.
101. When I hurt his feelings, my father stopped talking to me until I pleased him again.
102. When I upset her, my mother didn't have anything to do with me until I found a way to make up.
103. When I upset him, my father didn't have anything to do with me until I found a way to make up.

GO ON TO NEXT PAGE

104. *What is your age?*

1. 17 or younger
2. 18 or 19
3. 20 or 21
4. 22 or 23
5. 24 or older

105. *What is your racial background?*

1. white
2. black
3. other

106. *What is your current class standing?*

1. Freshman
2. Sophomore
3. Junior
4. Senior
5. Graduate student

107. *How many terms have you been a student at the M.S.U. campus?*

1. one term
2. 2 or 3 terms
3. 4 to 6 terms
4. 7 to 9 terms
5. 10 terms or more

108. *What is your parents current marital status?*

1. married and living together
2. separated or divorced
3. Mother living, Father deceased
4. Father living, Mother deceased
5. both deceased

109. *What is your family's gross income?*

1. under $6,000
2. $6,001 to 12,000
3. $12,001 to 18,000
4. $18,001 to 24,000
5. $24,001 or more

BE SURE EVERY QUESTION IS ANSWERED.
PLACE THE RESPONSE SHEET INTO THE RETURN ENVELOPE.
SEAL IT, AND DROP IT INTO THE CAMPUS MAIL SLOT TODAY!

APPENDIX TABLE 1

SELECTED SCALES FOR MAIN STUDY

Scale	Source	Domain	# Items	Reliability Coefficient[a]	Anticipated Administration Time[b] (minutes)
Provocation	Evans and Strangeland (1971)	degree of anger provoked by common daily frustrations	15	.75	2.35
Verbal hostility	(c)	tendency to express anger verbally	7	.70	1.20
Physical aggression	(c)	tendency to express anger physically	8	.79	1.37
Negativism	(c)	tendency to express anger by passive-aggressive withholding	3	.43	0.50
Parental attachment	new items, related to dimension outlined by Fisher (1973)	emotional individuation from parents	4	.50	0.77
Fear of expressing anger	(c)	fear of expressing anger	4	.59	0.68

APPENDIX TABLE 1 (cont'd.)

Scale	Source	Domain	# Items	Reliability Coefficient[a]	Anticipated Administration Time[b] (minutes)
Negative afterthoughts	(c)	guilt following expression of anger	5	.80	0.86
Trait anxiety	Spielberger (1970)	predisposition to experience state anxiety	10	.85	1.55
Suspicion	(c)	suspicion of personal approaches from others	5	.60	0.86
Resentment	(c)	general feelings of frustration and resentment	3	.46	0.50
Sexual experiences	Thomander (1974)	range of sexual experiences	4	.83	1.07
Dating history	Thomander (1974)	range of dating experiences	4	.81	1.67
Work endurance	Edwards' Personal Preference Schedule (1959)	tendency to stick to a task until completed	4	.53	0.66
Self-revelation	new items	tendency to reveal personal feelings to others	3	.54	0.58

APPENDIX TABLE 1 (cont'd.)

Scale	Source	Domain	# Items	Reliability Coefficient[a]	Anticipated Administration Time[b] (minutes)
Self-esteem	Tennessee Self-Concept Scale	satisfaction with self as an individual, and evaluation of personality	5	.78[d]	0.85[e]
Rigidity	Thomander (1974)	inflexibility and constriction of life style	6	.68	1.15
Moralism	new items	rejection of pre-marital sexuality	4	f	0.68[e]
Parent style	Schaefer (1965)	use of withdrawal of love and contact in disciplining child	4	f	0.68[e]
		Total Items =	98	Total Time =	17.98 (minutes)

[a]The reliability coefficient reported is a function of the homogeneity of the items within each scale, observed in the pilot study. In cases where items have been eliminated from the scale for use in the main study, a pro-rated reliability coefficient is reported.

[b]Administration time reported is the observed time for the scale during the pilot study. Where items have been eliminated from the scale for use in the main study, a pro-rated time is reported.

[c]Source is a modified form of the Buss-Durkee Hostility Inventory (1952), developed for use in the main study.

APPENDIX TABLE 1 (cont'd.)

---

[d] Test-retest reliability coefficient reported by Fitts (1975) in private communication.

[e] This scale was not run in the pilot study. The time shown is an estimate based on similar items used in the pilot study.

[f] This scale was not run in the pilot study. No reliability data is available as yet, but will be reported in the results of the main study.

APPENDIX TABLE 1 (cont'd.)

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[f]This scale was not run in the pilot study. No reliability data is available as yet, but will be reported in the results of the main study.

APPENDIX TABLE 2

INTERCORRELATIONS OF SCALES USED IN THE PILOT STUDY

REFLECT. (CONTROL CARD)

PROGRAM REFLECT, REFLECTED VARIABLES ARE..
VARS(9,25) (CONTROL CARD)

REFLECTED R-MATRIX

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1	100	46	36	27	35	30	5	9	15	15	19	32	11	3	-5	11	33	12	10	1	-11	15	11	6	3
2	46	100	31	30	37	50	-1	-2	8	18	36	27	4	11	-2	5	12	31	5	5	-19	8	22	5	10
3	36	31	100	28	40	46	18	-8	7	28	6	23	8	7	-18	12	20	22	-8	3	-3	17	-14	-0	17
4	27	30	28	100	36	34	11	22	10	23	34	17	34	21	2	10	28	12	6	10	-15	7	18	1	29
5	35	37	40	36	100	48	9	10	18	14	12	19	23	9	-16	11	27	22	4	17	-10	16	2	1	3
6	30	50	46	34	48	100	8	-3	2	18	21	25	7	9	-18	17	25	14	-14	6	-9	29	14	-7	16
7	5	-1	18	11	9	8	100	2	23	14	6	7	25	-22	-26	-9	-2	-2	-15	-12	12	-18	-18	10	-1
8	9	-2	-3	22	10	-3	2	100	10	10	-5	1	17	-1	4	-12	18	3	15	15	-9	2	1	4	4
9	15	8	7	10	18	2	23	10	100	-3	24	1	15	-20	-18	-15	8	7	12	-0	-9	7	-11	-10	-2
10	15	18	28	23	14	18	14	10	-3	100	30	13	16	13	7	7	17	14	-6	-7	-6	28	11	2	36
11	19	36	6	34	12	21	6	-5	24	30	100	27	30	32	20	25	26	8	8	-2	-27	18	10	-11	19
12	32	27	23	17	19	25	7	1	1	13	27	100	24	22	9	35	44	-4	-7	-15	-23	15	21	-20	26
13	11	4	8	34	23	7	25	17	15	16	30	24	100	17	7	13	36	-6	7	-0	-27	15	0	-11	12
14	3	11	7	21	-0	9	-22	-1	-20	13	32	22	17	100	58	29	23	-5	-6	10	-23	9	18	-3	29
15	-5	-2	-18	2	-16	-18	-26	4	-18	7	20	9	7	58	100	27	21	-9	2	16	-12	15	19	4	21
16	11	5	12	10	11	17	-9	-12	-15	7	25	35	13	29	27	100	47	-4	-0	15	-23	26	14	-18	23
17	33	12	20	28	27	25	-2	10	8	17	26	44	36	23	21	47	100	-9	-9	13	-26	32	15	-17	19
18	12	31	22	12	22	14	-2	3	7	14	8	-4	-6	-5	-9	-4	-9	100	31	33	-8	-17	8	1	3
19	10	5	-8	6	4	-14	-5	15	12	-6	8	-7	7	-6	2	-0	-9	31	100	33	-7	5	-14	7	-4
20	1	-9	-3	10	17	-9	-12	15	-0	-7	-2	-18	-0	10	16	15	-3	33	33	100	-1	-7	22	10	-17
21	-11	-19	-3	-15	-3	-9	12	-9	-9	-6	-27	-23	-27	-2	-12	-23	-26	-0	-7	-1	100	-17	-7	-6	-20
22	13	8	17	7	16	29	-10	2	7	28	16	16	15	9	16	26	32	-17	5	1	-17	100	16	-14	14
23	11	22	-14	18	2	14	-18	-4	-11	11	10	21	0	18	19	14	15	4	-14	22	-7	16	100	9	4
24	6	5	-3	1	-3	-7	10	-4	-10	2	-11	-20	-11	-3	-4	-10	-17	1	-7	10	-6	-14	9	100	-12
25	3	10	17	29	-3	16	-1	4	-2	36	19	26	12	29	21	23	19	3	-4	-17	-20	14	4	-12	100

1 minor chance annoyances
2 self-opinionated people
3 unaccepting people
4 criticism
5 authority
6 interpersonal encounters
7 verbal hostility
8 physical violence
9 minimizing anger
10 negativism
11 resentment
12 suspicion
13 irritability anger
14 fear of expressing afterthoughts
15 negative relationship instability
16 trait anxiety
17 work independence
18 work achievement
19 work endurance
20 sex experiences
21 parental attachment
22 rigidity
23 dating history
24 self-revelation
25

APPENDIX B

DIAGNOSTIC QUESTIONNAIRE

HEADACHE QUESTIONNAIRE

206

If your answer is YES, MARK COLUMN # 1.

If your answer is NO, MARK COLUMN # 2.

STUDENT NUMBER

DIGITS

1st | 2nd | 3rd | 4th | 5th | 6th

1. Have you had a headache within the last year?.....1
2. Have you ever had a head injury where you lost consciousness?.....2
3. Were your worst headaches severe or unbearable?.....3
4. Were your worst headaches located on only one side of your head (more than a momentary stab of pain)?.....4
5. When you had your worst headaches, did you vomit or feel nauseous (exclude time during pregnancy, if relevant)?.....5
6. Before you got your worst headaches, did you know they were coming?.....6
7. Have you ever consulted a doctor about your headaches?.....7
8. What is your average frequency of headaches?.....8

several a day.....1	1 per week.....5
daily.....2	2-3 per month.....6
5-6 per week.....3	1 monthly or bimonthly...7
2-4 per week.....4	less than 6 per year.....8

9. How do feel most of the time?.....9

very relaxed & happy.....1	somewhat tense & upset.....4
somewhat relaxed & happy.2	very tense & upset.....5
neither relaxed & happy, nor tense & upset.....3	

10. Your sex? (Males mark Col. #1; Females mark Col. #2).....10

Do you associate your headaches with any of the following events?:

11. Prepairing for exams?.....11
12. Getting angry?.....12
13. Eating particular foods?.....13
14. Going on a date?.....14

Thank you for completing the questionnaire.

Be sure all items are answered in the correct space.

PLEASE PLACE THIS SHEET IN THE RETURN ENVELOPE.

DROP THE ENVELOPE IN THE CAMPUS MAIL TODAY.

Thanks again.

Return to: David Schnarch, Dept. of Psychology, Olds Hall.

APPENDIX C

COVER LETTERS FOR DIAGNOSTIC AND PERSONALITY QUESTIONNAIRES

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF PSYCHOLOGY
OLDS HALL

EAST LANSING · MICHIGAN · 48824

April 8, 1975

Dear Student:

You are being asked to participate in a major research effort that may directly lead to better treatment of a universal problem: HEADACHE. The Department of Psychology and a Federal Bio- Medical Research Grant are supporting a campus-wide study of headache incidence and life history. We are interested in finding out who has headaches, who doesn't, and why.

Your name was selected at random from the list of undergraduates registered for Spring Term. We would like less than 5 minutes of your time. We are asking you to answer the enclosed 14-item questionnaire, and drop it in the campus mail slot.

From responses to the 5,000 questionnaires that were sent out, some students will be recontacted and invited to participate further in the study. For most people, participation will be limited to completing and returning the form you now have.

Please do not put your name or student number on the sheet. It has been printed with a random research number that is unrelated to any other university information. All your responses will remain confidential.

Simply use a pencil to fill in your responses in the correct places on the answer sheet. Place the completed sheet into the return envelope, tuck the sealing flap in, and drop it into the campus mail.

To be truly useful, random sampling requires a high return rate of responses. Four minutes of your time will seem more than worthwhile if you or someone you care about has ever suffered a splitting headache. Your help will be appreciated. If you have any questions I may be reached at 332-4302.

Thank you for your cooperation,

David M. Schnarch

David M. Schnarch, M. A.
Principle Investigator

Donald L. Grummon

Dr. Donald Grummon
Department of Psychology
Research Supervisor

John Hunter

Dr. John Hunter
Department of Psychology
Research Supervisor

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF PSYCHOLOGY
OLDS HALL

EAST LANSING · MICHIGAN · 48824

April 15, 1975

Dear Friend:

You are being invited to partake in further research on the causal factors of headache. This invitation is based on careful analysis of over 5,000 questionnaires, previously mailed to undergraduate students at Michigan State. Your responses have identified you as a particularly important individual to our study. We hope to receive responses from students, like yourself, who experience different frequencies of headache or no headache at all. From these responses we hope to gain a far better understanding of the nature of headache, particularly its early diagnosis and identification of individuals prone to its debilitating effects.

The enclosed questionnaire has been designed to facilitate this better understanding. We are attempting to measure probable aspects of headache causation. Through extensive field testing, a wide range of student 'input' has helped to refine this instrument to its present state. During the field testing, students averaged approximately 18 to 20 minutes in responding.

We are asking you to give us 20 minutes of your time to help in this worthwhile effort. Your responses will be kept completely confidential. In no way will your responses be traceable to you. Once the questionnaire is returned, your name will be removed from our files and destroyed. At this point, all possible links back to you will have been severed.

We urge you most sincerely to take these few minutes of your time now! We need nearly 100% participation. This phase of the research is scheduled to be completed by May 31, 1975. Because of this, we must ask you to return this questionnaire no later than May 9, 1975. We will attempt to contact those participants whose questionnaires have not been received by this date.

We would like to express our sincere appreciation for your cooperation in this project. If you have any questions regarding this study, please contact me at 332-4302.

Thank you for your cooperation,

David M. Schnarch

David M. Schnarch, M.A.
Principle Investigator

Donald L. Grummon

Dr. Donald Grummon
Department of Psychology
Research Supervisor

John Hunter

Dr. John Hunter
Department of Psychology
Research Supervisor

APPENDIX D

ITEM LIST FOR SCALES USED IN THE PERSONALITY QUESTIONNAIRE

PROVOCATION SCALE

MINOR CHANCE ANNOYANCES

15 FINDING OUT ABOUT SOMETHING YOU WOULD HAVE WANTED TO SEE, AFTER YOU LEAVE A PLACE (1)
21 HAVING TO DO SOMETHING ELSE WHEN YOU ARE IN A HURRY (7)
26 BEING INTERRUPTED (12)

SELF-OPINIONATED PEOPLE

17 PEOPLE WHO BRAG ABOUT THINGS (3)
22 PEOPLE WHO THINK THEY KNOW IT ALL (8)
27 PEOPLE WHO THINK THEY ARE ALWAYS RIGHT (13)

CRITICISM

19 CRITICISM (5)
24 PEOPLE BEING SARCASTIC TOWARDS YOU (10)
28 BEING TEASED ABOUT YOUR FAULTS (14)

INTERPERSONAL ENCOUNTERS

16 PEOPLE TAKING ADVANTAGE OF YOU (2)
18 WAITING FOR SOMEONE WHO IS LATE OR DOESNT SHOW UP (4)
20 PEOPLE ACTING AS THOUGH YOU ARE STUPID (6)
23 BEING IGNORED BY SOMEONE (9)
25 FINDING SOMEONE HAS LIED TO YOU (11)
29 LAZY PEOPLE WHO WONT DO THEIR SHARE (15)

ANGER EXPRESSION INVENTORY

VERBAL ASSAULT

30 WHEN SOMEONE MAKES ME MAD, I AM APT TO SAY SOMETHING TO INSULT THAT PERSON (16)
37 WHEN I AM ANGRY AT SOMEONE, I MAKE SARCASTIC REMARKS TO THEM (23)
44 IF SOMEONE MAKES ME MAD, I TELL THEM OFF (30)
51 WHEN I GET MAD I SAY NASTY THINGS (37)
59 I WILL SAY THINGS TO PUT A PERSON DOWN IF THEY MAKE ME ANGRY (45)
66 I DONT TELL PEOPLE OFF, EVEN IF THEY DESERVE IT (52)
72 NO MATTER HOW ANGRY I GET, I DONT SAY ANYTHING TO THE OTHER PERSON (58)

PHYSICAL VIOLENCE

34 WHEN I AM MAD, I SLAM DOORS (20)
42 I GET SO ANGRY I PICK UP THE NEAREST THING AND BREAK IT (28)
47 I SHOW MY ANGER BY BANGING ON THE TABLE (33)
55 I THROW THINGS WHEN I GET MAD (41)
61 I TAKE MY ANGER OUT ON NON-LIVING THINGS (47)
69 WHEN I AM ANGRY I HIT WALLS (55)
75 WHEN I REALLY LOSE MY TEMPER, I AM CAPABLE OF SLAPPING SOMEONE (61)
80 IF I AM PUSHED TOO FAR, I WILL HIT A PERSON (66)

NEGATIVISM

32 WHEN I AM ANGRY AT SOMEONE, I WONT DO WHAT THEY ASK ME TO (18)
54 IF I AM ANGRY AT SOMEBODY WHO ASKS ME TO DO SOMETHING, I WILL SAY YES, BUT PUT IT OFF INDEFINATELY (40)
85 WHEN I AM ANGRY AT SOMEBODY, I DO THE OPPOSITE OF WHATEVER THEY ASK (71)

RESENTMENT

39 I AM BITTER ABOUT NOT GETTING WHAT IS COMING TO ME (25)
60 IT MAKES ME MAD WHEN I SEE OTHER PEOPLE GETTING THINGS THEY DONT DESERVE (46)
76 WHEN I LOOK BACK ON WHATS HAPPENED TO ME, I CANT HELP FEELING MILDLY RESENTFUL (62)

SEXUAL MORALITY

100 PETTING IS ACCEPTABLE BEFORE MARRIAGE FOR A PERSON OF MY SEX, IF THE PERSON IS ENGAGED TO BE MARRIED (86)

101 PETTING IS ACCEPTABLE BEFORE MARRIAGE FOR A PERSON OF MY SEX, IF THEY LIKE THEIR PARTNER (BUT DONT NECCESSARILY LOVE THEM) (87)

102 FULL SEXUAL RELATIONS ARE ACCEPTABLE BEFORE MARRIAGE FOR A PERSON OF MY SEX, IF THEY ARE ENGAGED TO BE MARRIED (88)

103 FULL SEXUAL RELATIONS ARE ACCEPTABLE BEFORE MARRIAGE FOR A PERSON OF MY SEX, IF THEY LIKE THEIR PARTNER (BUT DONT NECCESSARILY LOVE THEM) (89)

104 FULL SEXUAL RELATIONS ARE ACCEPTABLE BEFORE MARRIAGE FOR A PERSON OF MY SEX, EVEN IF THEY DONT FEEL A STRONG LIKING TOWARDS THEIR PARTNER (90)

BACKGROUND DATA

109 WHAT IS YOUR SEXUAL ORIENTATION (95)
A) HETEROSEXUAL
B) HOMOSEXUAL
C) BISEXUAL

118 WHAT IS YOUR AGE (104)

119 WHAT IS YOUR RACIAL BACKGROUND (105)

120 WHAT IS YOUR CURRENT CLASS STANDING (106)

121 HOW MANY TERMS HAVE YOU BEEN A STUDENT AT THE MSU CAMPUS (107)

122 WHAT IS YOUR PARENTS CURRENT MARITAL STATUS (108)

123 WHAT IS YOUR FAMILYS GROSS INCOME (109)

TRAIT ANXIETY

93 I FEEL PLEASANT (76)
94 I FEEL NERVOUS AND RESTLESS (78)
95 I AM HAPPY (80)
96 I FEEL SECURE (81)
97 I AM CONTENT (83)
98 I FEEL THAT DIFFICULTIES ARE PILING UP SO THAT I CANNOT OVERCOME THEM (77)
99 I WORRY TOO MUCH OVER SOMETHING THAT REALLY DOESN'T MATTER (79)
100 SOME UNIMPORTANT THOUGHT RUNS THROUGH MY MIND AND BOTHERS ME (82)
101 I TAKE DISAPPOINTMENTS SO KEENLY THAT I CAN'T PUT THEM OUT OF MY MIND (84)
102 I BECOME TENSE AND UPSET WHEN I THINK ABOUT MY PRESENT CONCERNS (85)

PARENTAL ATTACHMENT

35 SOMETIMES I DONT THINK I COULD COPE WITH MY PARENTS DYING (21)
57 I WORRY ABOUT MY PARENTS BEING UNHAPPY (36)
[illegible] I FEEL I WILL NEVER BE AS CLOSE TO ANYONE AS I AM TO MY PARENTS (57)

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WITHDRAWAL OF RELATIONSHIP

10 MY MOTHER AVOIDED LOOKING AT ME WHEN I DISAPPOINTED HER (96)
11 MY FATHER AVOIDED LOOKING AT ME WHEN I DISAPPOINTED HIM (97)
12 SOMETIMES WHEN SHE DISAPPROVED, MY MOTHER DIDNT SAY ANYTHING BUT WAS COLD AND DISTANT FOR AWHILE (98)
13 SOMETIMES WHEN HE DISAPPROVED, MY FATHER DIDNT SAY ANYTHING BUT WAS COLD AND DISTANT FOR AWHILE (99)
14 WHEN I HURT HER FEELINGS, MY MOTHER STOPPED TALKING TO ME UNTIL I PLEASED HER AGAIN (100)
15 WHEN I HURT HIS FEELINGS, MY FATHER STOPPED TALKING TO ME UNTIL I PLEASED HIM AGAIN (101)
16 WHEN I UPSET HER, MY MOTHER DIDNT HAVE ANYTHING TO DO WITH ME UNTIL I FOUND A WAY TO MAKE UP (102)
17 WHEN I UPSET HIM, MY FATHER DIDNT HAVE ANYTHING TO DO WITH ME UNTIL I FOUND A WAY TO MAKE UP (103)

SELF REVELATION

36 I STILL UNABLE TO TELL ANYONE ALL ABOUT MYSELF (39)
[illegible] REVEAL MY DEEPEST FEELINGS TO MY FRIENDS (49)
69 IF SOMEONE IS IMPORTANT TO ME, IT IS EASY FOR ME TO LET THEM KNOW IT (54)

WORK ORIENTANCE

46 I KEEP AT A JOB UNTIL IT IS FINISHED (32)
[illegible] (49)
82 I WOULD RATHER STAY UP LATE WORKING IN ORDER TO GET A JOB DONE, THAN PUT IT OFF TILL THE NEXT DAY (69)

SELF-CONCEPT

38 I AM SATISFIED WITH MYSELF AS A PERSON (24)
45 I AM JUST AS NICE AS I SHOULD BE (31)
[illegible] I DISPISE MYSELF (56)
73 I AM AS SMART AS I WANT TO BE (57)
83 I AM NOT THE PERSON I WOULD LIKE TO BE (69)

RIGIDITY

31 I LIKE THE IDEA OF HAVING MY MEALS AT GOD HOURS AND GOING TO BED WHEN THE MOOD STRIKES ME (17)
42 I FIND IT EASY TO STICK TO A CERTAIN SCHEDULE, ONCE I HAVE STARTED ON IT (29
52 I DO DANGEROUS THINGS JUST FOR THE THRILL OF IT (34)
[illegible] (50)
74 I DONT LIKE TO CHANGE PLANS IN THE MIDDLE OF AN UNDERTAKING (60)
79 I LIKE A GREAT DEAL OF VARIETY IN MY LIFE (64)

SUSPICION

[illegible] I AM ON MY GUARD WITH PEOPLE [illegible] TO ME THAN I EXPECTED (19)
41 I WONDER WHAT HIDDEN REASON ANOTHER PERSON MAY HAVE FOR DOING SOMETHING NICE FOR ME (27)
48 I THINK PEOPLE RARELY TELL THE TRUTH (34)
65 ITS NEVER SAFE TO TAKE WHAT PEOPLE SAY AT FACE VALUE (51)

FEARS OF EXPRESSION

49 WHEN I EXPRESS MY ANGER, I AM AFRAID THAT SOMETHING BAD WILL HAPPEN TO ME 35
69 I FEEL UNEASY WHEN MY ANGER AT SOMEONE SHOWS (48)
77 I WORRY THAT PEOPLE WONT LIKE ME IF I EXPRESS MY ANGER (63)
84 ITS EASY FOR ME TO EXPRESS MY ANGER THE WAY I WOULD REALLY LIKE TO (70)

NEGATIVE AFTERTHOUGHTS

4[illegible] WHEN I SHOW I AM ANGRY AT SOMEONE, I CANT STOP THINKING THAT I SHOULDNT HAVE (26)
53 WHEN I EXPRESS MY ANGER, I FEEL AFTERWARDS THAT I WAS WRONG (39)
58 AFTER I EXPRESS MY ANGER, I WONDER IF I WAS JUSTIFIED (44)
79 WHEN I SHOW MY ANGER IN A SITUATION, I FEEL AFTERWARDS THAT I HAD EVERY REASON TO DO SO (65)
81 WHEN I SHOW I AM ANGRY, I OFTEN REGRET IT AFTERWARDS (67)

SEXUAL EXPERIENCES

105 KISSED AND HUGGED CONTINUOUSLY FOR AN HOUR (91)
106 HAD YOUR GENITALS FOMPLETED BY A PERSON OF THE OPPOSITE SEX (92)
107 HAD SEXUAL INTERCOURSE (93)
108 HAD ORGASM DURING INTERCOURSE (94)

DATING HISTORY

86 HOW MANY REAL DATES HAVE YOU HAD..... (72)
A) NONE
B) ONE
C) 2 TO 5
D) 6 TO 14
E) 15 OR MORE

87 WHAT IS YOUR AVERAGE RATE OF DATING.... (73)
A) NEVER DATED
B) HAVE NOT DATED IN THE LAST YEAR
C) 1 OR MORE DATES A YEAR, BUT LESS THAN AN AVERAGE OF 1 A MONTH
D) 1 OR MORE DATES A MONTH, BUT LESS THAN AN AVERAGE OF 1 A WEEK
E) ONE OR MORE DATES A WEEK

88 WHAT IS YOUR EMOTIONAL COMMITMENT TO THE PERSON(S) YOU ARE DATING.... (74)
A) NOT DATING
B) DATING BUT NO EMOTIONAL COMMITMENT
C) DATE ONLY EACH OTHER
D) ENGAGED
E) MARRIED OR LIVING TOGETHER AS A COUPLE

89 HOW MANY TIMES HAVE YOU SHARED A RELATIONSHIP WITH A PERSON OF THE OPPOSITE SEX, IN WHICH YOU BOTH AGREED TO DATE ONLY EACH OTHER..... (75)
A) NEVER
B) ONCE
C) TWICE
D) THREE TIMES
E) FOUR OR MORE TIMES

1 HAVE YOU HAD A HEADACHE IN THE LAST YEAR

2 HAVE YOU EVER HAD A HEAD INJURY WHERE YOU LOST CONSCIOUSNESS

3 WERE YOUR WORST HEADACHES SEVERE OR UNBEARABLE

4 WERE YOUR WORST HEADACHES LOCATED ON ONLY ONE SIDE OF YOUR HEAD (MORE THAN A MOMENTARY STAB OF PAIN)

5 WHEN YOU HAD YOUR WORST HEADACHES, DID YOU VOMIT OR FEEL NAUSEOUS (EXCLUDE TIME DURING PREGNANCY, IF RELEVANT)

6 BEFORE YOU GOT YOUR WORST HEADACHES, DID YOU KNOW THEY WERE COMING

7 HAVE YOU EVER CONSULTED A DOCTOR ABOUT YOUR HEADACHES

8 WHAT IS YOUR AVERAGE FREQUENCY OF HEADACHES.....

SEVERAL A DAY.....1

DAILY.....2

5-6 PER WEEK.....3

2-4 PER WEEK.....4

1 PER WEEK.....5

2-3 PER MONTH.....6

2 MONTHLY OR 3 MONTHLY.....7

LESS THAN 6 PER YEAR.....8

9 HOW DO YOU FEEL MOST OF THE TIME (9)

VERY RELAXED AND HAPPY.....1

SOMEWHAT RELAXED AND HAPPY.....2

NEITHER RELAXED AND HAPPY, NOR TENSE AND UPSET.....3

SOMEWHAT TENSE AND UPSET.....4

VERY TENSE AND UPSET.....5

10 YOUR SEX

11 PREPARING FOR EXAMS

12 GETTING ANGRY

13 EATING PARTICULAR FOODS

14 GOING ON A DATE

APPENDIX E

PARTIAL PRESENTATION OF DATA FROM BIHLDORF, KING, AND PARNES (1971)

[DATA COLLAPSED FOR PRESENTATION]

"After I get angry at someone, I can't stop thinking about what I wish I had said or done"

	Agree	Can't Say	Disagree
Migraine (N = 33)	57.6%	6.1%	36.4%
Tension (N = 41)	78.1	2.0	19.5
Controls (N = 27)	48.1	0.0	51.8

χ^2 p = .02

"When I express my anger, I feel afterward I was wrong"

	Agree	Can't Say	Disagree
Migraine	24.2%	15.2%	60.7
Tension	36.6	19.5	43.9
Controls	14.8	14.8	70.3

χ^2 p = .03

"In general, how comfortable are you in expressing your feelings of anger directly to other people?"

	Comfortable	Uncomfortable
Migraine	21.3%	78.7
Tension	22.0	78.0
Controls	66.6	33.4

χ^2 p = .002

APPENDIX F

CODEBOOK OF PERSONALITY AND BACKGROUND SCALES

MINOR MATRIX 2 CODE BOOK

Minor Matrix 2 Var #		Description
Var	1	Headache in the last year
	2	Head injury
	3	Severe or unbearable headache
	4	Unilateral pain
	5	Vomit/Nausea
	6	Warning
	7	Consult doctor
	8	Frequency of headache
	9	General feeling
	10	Gender
	11	Exams give headaches
	12	Anger gives headaches
	13	Foods give headaches
	14	Dating gives headaches
	15	Age
	16	Racial background
	17	Class standing
	18	Terms at M.S.U.
	19	Parents' marital status
	20	Family income
	21	Verbal aggression
	22	Physical aggression
	23	Negativism
	24	Resentment
	25	Suspicion
	26	Fear of expressing anger
	27	Negative afterthoughts
	28	Rigidity
	29	Parental attachment
	30	Self-revelation
	31	Trait anxiety
	32	Work endurance
	33	Sexual experience
	34	Dating experience

MINOR MATRIX 2 CODE BOOK (cont'd.)

Minor Matrix 2 Var #	Description
Var 35	Self-concept
36	Morality
37	Parental discipline
38	Minor chance annoyance
39	Self-opinionated people
40	Interpersonal encounters
41	Criticism
42	Total provocation
43	Tell off (verbal aggression)
44	Nasty (verbal aggression)
45	Hit things (physical aggression)
47	Trait anxiety (NEG indeces)
48	Traint anxiety (POS indeces)
49	Mother discipline
50	Father discipline
51	Omit
52	Migraine index
53	Pseudo-migraine index (less than all three traits reported)
54	Sex-by-migraine interaction index

APPENDIX G

ADDITIONAL DATA FROM

THE PRESENT STUDY

BREAKDOWN B 1,0,0.

2 x 2 Matrices

Cluster 5 Suspicion

Migraine

	male	female	
severe	1.75	1.73	$\bar{x}=1.74$
non-severe	1.38	1.63	$\bar{x}=1.51$
	$\bar{x}=1.57$	$\bar{x}=1.68$	

$\bar{x}_g = 1.62$

Tension

	male	female	
severe	1.59	1.50	$\bar{x}=1.55$
non-severe	1.50	1.45	$\bar{x}=1.48$
	$\bar{x}=1.55$	$\bar{x}=1.48$	

$\bar{x}_g = 1.51$

Cluster 7 Negative afterthoughts

Migraine

	male	female	
severe	2.31	1.98	$\bar{x}=2.15$
non-severe	2.02	2.03	$\bar{x}=2.03$
	$\bar{x}=2.17$	$\bar{x}=2.01$	$\bar{x}_g=2.09$

Tension

	male	female	
severe	1.97	1.96	$\bar{x}=1.97$
non-severe	1.93	1.88	$\bar{x}=1.9$
	$\bar{x}=1.95$	$\bar{x}=1.92$	$\bar{x}_g=1.94$

Cluster 6 Fear of expressing anger

Migraine

	male	female	
severe	2.15	1.87	$\bar{x}=2.01$
non-severe	1.73	1.88	$\bar{x}=1.81$
	$\bar{x}=1.94$	$\bar{x}=1.88$	$\bar{x}_g=1.91$

Tension

	male	female	
severe	1.79	1.77	$\bar{x}=1.7$
non-severe	1.73	1.79	$\bar{x}=1.7$
	$\bar{x}=1.76$	$\bar{x}=1.78$	$\bar{x}_g=1.77$

Cluster 8 Rigidity

Migraine

	male	female	
severe	2.00	2.04	$\bar{x}=2.02$
non-severe	2.35	2.07	$\bar{x}=2.21$
	$\bar{x}=2.18$	$\bar{x}=2.06$	

$\bar{x}_g = 2.12$

Tension

	male	female	
severe	2.14	2.03	$\bar{x}=2.09$
non-severe	1.95	1.93	$\bar{x}=1.94$
	$\bar{x}=2.05$	$\bar{x}=1.98$	

$\bar{x}_g = 2.01$

Cluster 9 Parental attachment

Migraine

	male	female	
severe	1.54	1.83	$\bar{x}=1.69$
non-severe	1.73	1.58	$\bar{x}=1.66$
	$\bar{x}=1.64$	$\bar{x}=1.71$	

$\bar{x}_g = 1.67$

Tension

	male	female	
severe	1.62	1.66	$\bar{x}=1.64$
non-severe	1.49	1.58	$\bar{x}=1.54$
	$\bar{x}=1.56$	$\bar{x}=1.62$	

$\bar{x}_g = 1.59$

Clusters	Trait anxiety
27	High indices
28	Low indices

Cluster 11 Trait anxiety

Migraine

	male	female	
severe	2.11	2.20	$\bar{x}$=2.16
non-severe	1.86	2.38	$\bar{x}$=2.12
	$\bar{x}$=1.99	$\bar{x}$=2.29	$\bar{x}_g$=2.14

Tension

	male	female	
severe	2.18	2.09	$\bar{x}$=2.14
non-severe	1.88	1.92	$\bar{x}$=1.90
	$\bar{x}$=2.03	$\bar{x}$=2.01	$\bar{x}_g$=2.02

Cluster 27 High indices

Migraine

	male	female	
severe	2.04	2.13	$\bar{x}$=2.09
non-severe	1.80	2.39	$\bar{x}$=2.10
	$\bar{x}$=1.92	$\bar{x}$=2.26	$\bar{x}_g$=2.09

Tension

	male	female	
severe	2.22	2.10	$\bar{x}$=2.16
nonsevere	1.96	1.93	$\bar{x}$=1.95
	$\bar{x}$=2.09	$\bar{x}$=2.02	$\bar{x}$=2.05

Cluster 28 Low indices

Migraine

	male	female	
severe	2.18	2.26	$\bar{x}$=2.22
nonsevere	1.92	2.37	$\bar{x}$=2.15
	$\bar{x}$=2.05	$\bar{x}$=2.32	$\bar{x}_g$=2.18

Tension

	male	female	
severe	2.13	2.07	$\bar{x}$=2.10
nonsevere	1.81	1.91	$\bar{x}$=1.86
	$\bar{x}$=1.97	$\bar{x}$=1.99	$\bar{x}_g$=1.98

MINOR MATRIX 2 CODE BOOK (cont'd.)

Minor Matrix 2 Var #	Description
Var 35	Self-concept
36	Morality
37	Parental discipline
38	Minor chance annoyance
39	Self-opinionated people
40	Interpersonal encounters
41	Criticism
42	Total provocation
43	Tell off (verbal aggression)
44	Nasty (verbal aggression)
45	Hit things (physical aggression)
47	Trait anxiety (NEG indeces)
48	Traint anxiety (POS indeces)
49	Mother discipline
50	Father discipline
51	Omit
52	Migraine index
53	Pseudo-migraine index (less than all three traits reported)
54	Sex-by-migraine interaction index

APPENDIX G

ADDITIONAL DATA FROM

THE PRESENT STUDY

BREAKDOWN B 1,0,0.

2 x 2 Matrices

Cluster 5 Suspicion

Migraine

	male	female	
severe	1.75	1.73	$\bar{x}$=1.74
non-severe	1.38	1.63	$\bar{x}$=1.51
	$\bar{x}$=1.57	$\bar{x}$=1.68	

$\bar{x}_g$= 1.62

Tension

	male	female	
severe	1.59	1.50	$\bar{x}$=1.55
non-severe	1.50	1.45	$\bar{x}$=1.48
	$\bar{x}$=1.55	$\bar{x}$=1.48	

$\bar{x}_g$= 1.51

Cluster 7 Negative afterthoughts

Migraine

	male	female	
severe	2.31	1.98	$\bar{x}=2.15$
non-severe	2.02	2.03	$\bar{x}=2.03$
	$\bar{x}=2.17$	$\bar{x}=2.01$	$\bar{x}_g=2.09$

Tension

	male	female	
severe	1.97	1.96	$\bar{x}=1.97$
non-severe	1.93	1.88	$\bar{x}=1.9$
	$\bar{x}=1.95$	$\bar{x}=1.92$	$\bar{x}_g=1.94$

Cluster 6 Fear of expressing anger

Migraine

	male	female	
severe	2.15	1.87	$\bar{x}=2.01$
non-severe	1.73	1.88	$\bar{x}=1.81$
	$\bar{x}=1.94$	$\bar{x}=1.88$	$\bar{x}_g=1.91$

Tension

	male	female	
severe	1.79	1.77	$\bar{x}=1.78$
non-severe	1.73	1.79	$\bar{x}=1.76$
	$\bar{x}=1.76$	$\bar{x}=1.78$	$\bar{x}_g=1.77$

Cluster 8 Rigidity

Migraine

	male	female	
severe	2.00	2.04	$\bar{x}=2.02$
non-severe	2.35	2.07	$\bar{x}=2.21$
	$\bar{x}=2.18$	$\bar{x}=2.06$	

$\bar{x}_g = 2.12$

Tension

	male	female	
severe	2.14	2.03	$\bar{x}=2.09$
non-severe	1.95	1.93	$\bar{x}=1.94$
	$\bar{x}=2.05$	$\bar{x}=1.98$	

$\bar{x}_g = 2.01$

Cluster 9 Parental attachment

Migraine

	male	female	
severe	1.54	1.83	$\bar{x}=1.69$
non-severe	1.73	1.58	$\bar{x}=1.66$
	$\bar{x}=1.64$	$\bar{x}=1.71$	

$\bar{x}_g = 1.67$

Tension

	male	female	
severe	1.62	1.66	$\bar{x}=1.64$
non-severe	1.49	1.58	$\bar{x}=1.54$
	$\bar{x}=1.56$	$\bar{x}=1.62$	

$\bar{x}_g = 1.59$

Clusters	Trait anxiety
27	High indices
28	Low indices

Cluster 11 Trait anxiety

Migraine

	male	female	
severe	2.11	2.20	$\bar{x}$=2.16
non-severe	1.86	2.38	$\bar{x}$=2.12
	$\bar{x}$=1.99	$\bar{x}$=2.29	

$\bar{x}_g$=2.14

Tension

	male	female	
severe	2.18	2.09	$\bar{x}$=2.14
non-severe	1.88	1.92	$\bar{x}$=1.90
	$\bar{x}$=2.03	$\bar{x}$=2.01	

$\bar{x}_g$=2.02

Cluster 27 High indices

Migraine

	male	female	
severe	2.04	2.13	$\bar{x}$=2.09
non-severe	1.80	2.39	$\bar{x}$=2.10
	$\bar{x}$=1.92	$\bar{x}$=2.26	

$\bar{x}_g$=2.09

Tension

	male	female	
severe	2.22	2.10	$\bar{x}$=2.16
non-severe	1.96	1.93	$\bar{x}$=1.95
	$\bar{x}$=2.09	$\bar{x}$=2.02	

$\bar{x}$=2.05

Cluster 28 Low indices

Migraine

	male	female	
severe	2.18	2.26	$\bar{x}$=2.22
non-severe	1.92	2.37	$\bar{x}$=2.15
	$\bar{x}$=2.05	$\bar{x}$=2.32	

$\bar{x}_g$=2.18

Tension

	male	female	
severe	2.13	2.07	$\bar{x}$=2.10
non-severe	1.81	1.91	$\bar{x}$=1.86
	$\bar{x}$=1.97	$\bar{x}$=1.99	

$\bar{x}_g$=1.98

Cluster 12 Work endurance

Migraine

	male	female	
severe	2.31	2.13	$\bar{x}=2.22$
non-severe	2.33	2.02	$\bar{x}=2.18$
	$\bar{x}=2.32$	$\bar{x}=2.08$	

$\bar{x}_g = 2.20$

Tension

	male	female	
severe	2.10	2.12	$\bar{x}=2.11$
non-severe	2.14	2.17	$\bar{x}=2.16$
	$\bar{x}=2.12$	$\bar{x}=2.15$	

$\bar{x}_g = 2.13$

Cluster 14 Dating experience

Migraine

	male	female	
severe	3.44	3.45	$\bar{x} = 3.45$
non-severe	3.43	3.23	$\bar{x} = 3.33$
	$\bar{x} = 3.44$	$\bar{x} = 3.34$	

$\bar{x}_g = 3.39$

Tension

	male	female	
severe	3.08	3.29	$\bar{x} = 3.19$
non-severe	3.14	3.26	$\bar{x} = 3.20$
	$\bar{x} = 3.11$	$\bar{x} = 3.28$	

$\bar{x}_g = 3.19$

Cluster 15 Self-concept

Migraine

	male	female	
severe	2.41	2.40	$\bar{x}$ = 2.41
non-severe	2.77	2.22	$\bar{x}$ = 2.50
	$\bar{x}$ = 2.59	$\bar{x}$ = 2.31	

$\bar{x}_g$ = 2.45

Tension

	male	female	
severe	2.33	2.43	$\bar{x}$ = 2.38
non-severe	2.50	2.49	$\bar{x}$ = 2.50
	$\bar{x}$ = 2.42	$\bar{x}$ = 2.46	

$\bar{x}_g$ = 2.44

Cluster 16 Morality

Migraine

	male	female	
severe	2.26	2.64	$\bar{x}=2.45$
non-severe	2.08	2.85	$\bar{x}=2.47$
	$\bar{x}=2.17$	$\bar{x}=2.75$	

$\bar{x}_g = 2.46$

Tension

	male	female	
severe	2.00	2.76	$\bar{x}=2.38$
non-severe	2.29	2.76	$\bar{x}=2.53$
	$\bar{x}=2.15$	$\bar{x}=2.76$	

$\bar{x}_g = 2.46$

Clusters 17 Parental discipline
29 Mother discipline
30 Father discipline

Cluster 17 Parental discipline

Migraine

	male	female	
severe	1.49	1.55	$\bar{x}=1.52$
nonsevere	1.44	1.33	$\bar{x}=1.39$
	$\bar{x}=1.47$	$\bar{x}=1.44$	$\bar{x}_g=1.45$

Tension

	male	female	
severe	1.44	1.44	$\bar{x}=1.44$
nonsevere	1.28	1.41	$\bar{x}=1.35$
	$\bar{x}=1.36$	$\bar{x}=1.43$	$\bar{x}_g=1.39$

Cluster 29 Mother discipline

Migraine

	male	female	
severe	1.43	1.54	$\bar{x}=1.49$
nonsevere	1.48	1.43	$\bar{x}=1.46$
	$\bar{x}=1.46$	$\bar{x}=1.49$	$\bar{x}_g=1.47$

Tension

	male	female	
severe	1.45	1.51	$\bar{x}=1.48$
nonsevere	1.27	1.41	$\bar{x}=1.34$
	$\bar{x}=1.36$	$\bar{x}=1.46$	$\bar{x}_g=1.41$

Cluster 30 Father discipline

Migraine

	male	female	
severe	1.56	1.55	$\bar{x}=1.56$
nonsevere	1.40	1.22	$\bar{x}=1.31$
	$\bar{x}=1.48$	$\bar{x}=1.39$	$\bar{x}_g=1.43$

Tension

	male	female	
severe	1.43	1.37	$\bar{x}=1.40$
nonsevere	1.29	1.42	$\bar{x}=1.36$
	$\bar{x}=1.36$	$\bar{x}=1.40$	$\bar{x}_g=1.38$

Cluster 10 Self-revelation

Migraine

	male	female	
severe	2.15	2.14	$\bar{x}=2.15$
non-severe	2.17	2.22	$\bar{x}=2.20$
	$\bar{x}=2.16$	$\bar{x}=2.18$	

$\bar{x}_g=2.17$

Tension

	male	female	
severe	2.11	2.07	$\bar{x}=2.09$
non-severe	2.06	2.20	$\bar{x}=2.13$
	$\bar{x}=2.09$	$\bar{x}=2.14$	

$\bar{x}_g=2.11$

Cluster 4 Resentment

Migraine

	male	female	
severe	1.76	1.77	$\bar{x}=1.77$
non-severe	1.80	1.64	$\bar{x}=1.72$
	$\bar{x}=1.78$	$\bar{x}=1.71$	$\bar{x}_g=1.74$

Tension

	male	female	
severe	1.84	1.70	$\bar{x}=1.77$
non-severe	1.70	1.65	$\bar{x}=1.68$
	$\bar{x}=1.77$	$\bar{x}=1.68$	$\bar{x}_g=1.72$

Variable 7 Consult doctor

Migraine

	male	female	
severe	0.41	0.55	$\bar{x}=0.48$
non-severe	0.07	0.24	$\bar{x}=0.16$
	$\bar{x}=0.24$	$\bar{x}=0.40$	$\bar{x}_g=0.32$

Tension

	male	female	
severe	0.23	0.23	$\bar{x}=0.2$
non-severe	0.03	0.04	$\bar{x}=0.0$
	$\bar{x}=0.13$	$\bar{x}=0.14$	$\bar{x}_g=0.13$

Clusters	Physical aggression
25	Hit things (p. a.)
26	Hit people (p.a.)

Cluster 2 Physical aggression

Migraine

	male	female	
severe	1.37	1.29	$\bar{x}$ = 1.33
nonsevere	1.24	1.40	$\bar{x}$ = 1.32
	$\bar{x}$ = 1.31	$\bar{x}$ = 1.35	$\bar{x}_g$ = 1.33

Tension

	male	female	
severe	1.41	1.37	$\bar{x}$ = 1.39
nonsevere	1.34	1.27	$\bar{x}$ = 1.31
	$\bar{x}$ = 1.38	$\bar{x}$ = 1.32	$\bar{x}_g$ = 1.35

Cluster 25 Hit things (p.a.)

Migraine

	male	female	
severe	1.32	1.28	$\bar{x}$ = 1.30
nonsevere	1.22	1.37	$\bar{x}$ = 1.30
	$\bar{x}$ = 1.27	$\bar{x}$ = 1.33	$\bar{x}_g$ = 1.30

Tension

	male	female	
severe	1.36	1.36	$\bar{x}$ = 1.36
nonsevere	1.31	1.25	$\bar{x}$ = 1.28
	$\bar{x}$ = 1.34	$\bar{x}$ = 1.31	$\bar{x}_g$ = 1.32

Cluster 26 Hit people (p.a.)

Migraine

	male	female	
severe	1.50	1.31	$\bar{x}$ = 1.41
nonsevere	1.30	1.50	$\bar{x}$ = 1.40
	$\bar{x}$ = 1.40	$\bar{x}$ = 1.41	$\bar{x}_g$ = 1.40

Tension

	male	female	
severe	1.54	1.41	$\bar{x}$ = 1.48
nonsevere	1.43	1.31	$\bar{x}$ = 1.37
	$\bar{x}$ = 1.49	$\bar{x}$ = 1.36	$\bar{x}_g$ = 1.42

Clusters 22 Total provocation
19 Self-opinionated people
20 Interpersonal encounters
21 Criticism

Cluster 22 Total provocation

Migraine

	male	female	
severe	2.53	2.71	$\bar{x}$=2.62
nonsevere	2.67	2.58	$\bar{x}$=2.63
	$\bar{x}$=2.60	$\bar{x}$=2.65	$\bar{x}_g$=2.62

Tension

	male	female	
severe	2.57	2.73	$\bar{x}$=2.65
nonsevere	2.44	2.61	$\bar{x}$=2.53
	$\bar{x}$=2.51	$\bar{x}$=2.67	$\bar{x}_g$=2.59

Cluster 19 Self-opinionated people

Migraine

	male	female	
severe	2.63	2.69	$\bar{x}$=2.66
nonsevere	2.83	2.53	$\bar{x}$=2.68
	$\bar{x}$=2.73	$\bar{x}$=2.61	$\bar{x}_g$=2.67

Tension

	male	female	
severe	2.55	2.82	$\bar{x}$=2.69
nonsevere	2.44	2.62	$\bar{x}$=2.53
	$\bar{x}$=2.50	$\bar{x}$=2.72	$\bar{x}_g$=2.61

Cluster 20 Interpersonal encounters

Migraine

	male	female	
severe	3.20	3.33	$\bar{x}$=3.27
nonsevere	3.00	3.24	$\bar{x}$=3.12
	$\bar{x}$=3.10	$\bar{x}$=3.29	$\bar{x}_g$=3.19

Tension

	male	female	
severe	3.11	3.44	$\bar{x}$=3.28
nonsevere	2.93	3.27	$\bar{x}$=3.10
	$\bar{x}$=3.02	$\bar{x}$=3.36	$\bar{x}_g$=3.19

Cluster 21 Criticism

Migraine

	male	female	
severe	1.94	2.52	$\bar{x}$=2.23
nonsevere	2.33	2.29	$\bar{x}$=2.31
	$\bar{x}$=2.14	$\bar{x}$=2.41	$\bar{x}_g$=2.27

Tension

	male	female	
severe	2.35	2.38	$\bar{x}$=2.37
nonsevere	2.22	2.29	$\bar{x}$=2.26
	$\bar{x}$=2.29	$\bar{x}$=2.34	$\bar{x}_g$=2.31

Clusters		
	1	Verbal aggression
	23	Tell off (v. a.)
	24	Nasty (v. a.)

Cluster 1 Verbal aggression

Migraine

	male	female	
severe	1.91	1.81	$\bar{x}=1.86$
nonsevere	1.96	1.93	$\bar{x}=1.95$
	$\bar{x}=1.94$	$\bar{x}=1.87$	$\bar{x}_g=1.90$

Tension

	male	female	
severe	1.87	1.81	$\bar{x}=1.84$
nonsevere	1.81	1.71	$\bar{x}=1.76$
	$\bar{x}=1.84$	$\bar{x}=1.76$	$\bar{x}_g=1.80$

Cluster 23 Tell off (v. a.)

Migraine

	male	female	
severe	1.78	1.83	$\bar{x}=1.81$
nonsevere	1.87	1.89	$\bar{x}=1.88$
	$\bar{x}=1.83$	$\bar{x}=1.86$	$\bar{x}_g=1.84$

Tension

	male	female	
severe	1.88	1.92	$\bar{x}=1.90$
nonsevere	1.92	1.81	$\bar{x}=1.87$
	$\bar{x}=1.90$	$\bar{x}=1.87$	$\bar{x}=1.88$

Cluster 24 Nasty (v.a.)

Migraine

	male	female	
severe	2.01	1.79	$\bar{x}=1.90$
nonsevere	2.03	1.97	$\bar{x}=2.00$
	$\bar{x}=2.02$	$\bar{x}=1.88$	$\bar{x}_g=1.95$

Tension

	male	female	
severe	1.86	1.73	$\bar{x}=1.80$
nonsevere	1.72	1.64	$\bar{x}=1.68$
	$\bar{x}=1.79$	$\bar{x}=1.69$	$\bar{x}_g=1.74$

Cluster 13 Sexual experiences

Migraine

	male	female	
severe	1.25	1.29	$\bar{x} = 1.27$
non-severe	1.35	1.30	$\bar{x} = 1.33$
	$\bar{x} = 1.30$	$\bar{x} = 1.30$	

$\bar{x}_g = 1.30$

Tension

	male	female	
severe	1.27	1.34	$\bar{x} = 1.31$
non-severe	1.40	1.38	$\bar{x} = 1.39$
	$\bar{x} = 1.34$	$\bar{x} = 1.36$	

$\bar{x}_g = 1.35$

Variable 8 Frequency of Headache

Migraine

	male	female	
severe	4.59	4.13	$\bar{x}=4.36$ severe
non-severe	5.36	4.65	$\bar{x}=5.01$ non-severe
	$\bar{x}=4.98$	$\bar{x}=4.39$	

$\bar{x}_g = 4.68$

Tension

	male	female	
severe	5.30	5.05	$\bar{x}=5.18$ severe
non-severe	5.97	5.61	$\bar{x}=5.79$ non-severe
	$\bar{x}=5.64$	$\bar{x}=5.33$	

$\bar{x}_g = 5.48$

Variable 12 Anger gives headaches

Migraine

	male	female	
severe	0.55	0.62	$\bar{x} = 0.59$
non-severe	0.43	0.53	$\bar{x} = 0.48$
	$\bar{x} = 0.49$	$\bar{x} = 0.58$	

$\bar{x}_g = 0.53$

Tension

	male	female	
severe	0.34	0.44	$\bar{x} = 0.39$
non-severe	0.22	0.35	$\bar{x} = 0.29$
	$\bar{x} = 0.28$	$\bar{x} = 0.40$	

$\bar{x}_g = 0.34$

Variable 9 General well-being

Migraine

	male	female	
severe	1.77	1.40	$\bar{x}=1.59$
non-severe	1.29	1.41	$\bar{x}=1.35$
	$\bar{x}=1.53$	$\bar{x}=1.41$	$\bar{x}_g=1.47$

Tension

	male	female	
severe	1.51	1.26	$\bar{x}=1.39$
non-severe	1.21	1.17	$\bar{x}=1.19$
	$\bar{x}=1.36$	$\bar{x}=1.22$	$\bar{x}_g=1.29$

Variable 11 Exams give headache

Migraine

	male	female	
severe	0.41	0.62	$\bar{x}=0.52$
non-severe	0.43	0.65	$\bar{x}=0.54$
	$\bar{x}=0.42$	$\bar{x}=0.64$	

$\bar{x}_g = 0.53$

Tension

	male	female	
severe	0.29	0.56	$\bar{x}=0.4$
non-severe	0.24	0.45	$\bar{x}=0.3$
	$\bar{x}=0.27$	$\bar{x}=0.51$	

$\bar{x}_g = 0.39$

Variable 13 Food gives headaches

Migraine

	male	female	
severe	0.23	0.28	$\bar{x}=0.26$
non-severe	0.29	0.06	$\bar{x}=0.18$
	$\bar{x}=0.26$	$\bar{x}=0.17$	

$\bar{x}_g = 0.22$

Tension

	male	female	
severe	0.07	0.11	$\bar{x}=0.0$
non-severe	0.05	0.04	$\bar{x}=0.0$
	$\bar{x}=0.06$	$\bar{x}=0.08$	

$\bar{x}_g = 0.07$

Variable 14 Dating gives headaches

Migraine

	male	female	
severe	0.11	0.19	$\bar{x}=0.17$
non-severe	0.07	0	$\bar{x}=0.04$
	$\bar{x}=0.11$	$\bar{x}=0.10$	$\bar{x}_g=0.10$

Tension

	male	female	
severe	0.04	0.04	$\bar{x}=0.0$
non-severe	0.01	0.04	$\bar{x}=0.0$
	$\bar{x}=0.03$	$\bar{x}=0.04$	$\bar{x}=0.03$

APPENDIX H

QUESTIONNAIRE MATERIALS USED IN SAMPLING OF NEW YORK UNIVERSITY STUDENTS, MERIDIAN MALL Ss, COMMUNITY MENTAL HEALTH CENTER Ss, AND M.S.U. COUNSELING CENTER Ss.

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF PSYCHOLOGY
OLDS HALL

EAST LANSING • MICHIGAN • 48824

Dear New York University Student:

You are being asked to participate in a major research effort that may directly lead to better treatment of a universal problem: HEADACHES. The Department of Psychology at Michigan State University and a Federal Bio-Medical Research Grant are supporting a multi-campus study of headache incidence and life history. We are interested in finding out who has headaches, who doesn't, and why.

Please give us one minute of your time to fill out our brief questions.

Do not enter your name or student number on this sheet. YOUR RESPONSES WILL REMAIN STRICTLY ANONYMOUS.

David M. Schnarch, M.A.
Primary Investigator

Professor Donald Grummon
Department of Psychology

Professor John Hunter
Department of Psychology

1. Have you had a headache within the last year?.....1 /NO/ /YES/
2. Have you ever had a head injury where you lost consciousness?.2 /NO/ /YES/
3. Were your worst headaches severe or unbearable?.....3 /NO/ /YES/
4. Were your worst headaches located on only one side of your head (more than a momentary stab of pain)?.....4 /NO/ /YES/
5. When you had your worst headaches, did you vomit or feel nauseous (exclude time during pregnancy, if relevant)?.....5 /NO/ /YES/
6. Before you got your worst headaches, did you know they were coming?.....6 /NO/ /YES/
7. Have you ever consulted a doctor about your headaches?.....7 /NO/ /YES/
8. What is your average frequency of headaches? (Check one)

several a day.....1	/__/	1 per week.....5	/__/
daily.....2	/__/	2-3 per month.....6	/__/
5-6 per week.....3	/__/	1 monthly or bimonthly.....7	/__/
2-4 per week.....4	/__/	less than 6 per year.....8	/__/

9. How do you feel most of the time? (Check one)

very relaxed & happy.....1	/__/	somewhat tense & upset.....4	/__/
somewhat relaxed & happy.....2	/__/	very tense & upset.....5	/__/
neither relaxed & happy, nor tense & upset.....3	/__/		

10. Your sex?..... /MALE/ /FEMALE/

Do you associate your headaches with any of the following events:?

11. Preparing for exams?.....11 /NO/ /YES/
12. Getting angry?.....12 /NO/ /YES/
13. Eating particular foods?.....13 /NO/ /YES/
14. Going on a date?.....14 /NO/ /YES/

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF PSYCHOLOGY
OLDS HALL

EAST LANSING • MICHIGAN • 48824

DEBRIEFING STATEMENT

The questionnaire you have just completed is part of a larger study, seeking to assess the role of personality in migraine causation. A migraine headache results from the dilation and contraction of the arteries in the skull. Tension headache, in comparison, results from the contraction of the muscles in the face, head, and neck. Migraine is generally more severe and less common.

When the data from 5,000 students at Michigan State University were analyzed, we found that migraine incidence was about one percent. This was surprising because the research literature predicted an incidence of between five and eight percent. Thus, the rate of migraine incidence among students at other campuses became of interest to us.

Your responses to the questionnaire will allow us to diagnose the type of headache you have. Migraine is best identified by the presence of three symptoms: warning of impending headaches thru "prodromal symptoms;" unilateral head pain; and vomiting or nausea accompanying the headache. Ss who have incurred severe head injury may show these symptoms in headaches due to organic damage, and thus are eliminated from the migraine-diagnosed group.

Ss in the Michigan State University sample were also asked to complete a 109 item personality inventory. The personality dimensions and background history collected in the inventory were specially selected to tap areas relevant to the psychoanalytic model of migraine, which suggests that migraine is triggered by chronic repression of anger. The last four questions you answered today are related to the larger inventory, albeit somewhat more general. This information will eventually allow us to assess the role of personality in migraine causation.

At the present time, the predominant modes of migraine treatment are chemotherapy and psychotherapy. Some initial attempts at bio-feedback training have shown promise. If our research can finally establish the personality profiles of migrainous and non-migrainous people, it is possible that the results can suggest whether personality-based forms of treatment are appropriate.

DEPARTMENT OF PSYCHOLOGY
OLDS HALL

EAST LANSING • MICHIGAN • 48824

Dear Citizen:

We need two minutes of your time to help us learn about HEADACHES and their causes. This research is being done by scientists at Michigan State University. Over 5,000 people have already done their part in this study. Now we are asking you to answer a few brief questions about your own experience with headaches.

DO NOT PUT YOUR NAME ON THIS SHEET. No one will be able to identify your answers.

When you are done, place your sheet in the box provided. Your help will be greatly appreciated.

David M. Schnarch, M.A.
Primary Investigator

Professor Donald Grummon
Department of Psychology

Professor John Hunter
Department of Psychology

1. Have you had a headache within the last year?.....1 /NO/ /YES/
2. Have you ever had a head injury where you lost consciousness?.....2 /NO/ /YES/
3. Were your worst headaches severe or unbearable?.....3 /NO/ /YES/
4. Were your worst headaches located on only one side of your head (more than a momentary stab of pain)?.....4 /NO/ /YES/
5. When you had your worst headaches, did you vomit or feel nauseous (exclude time during pregnancy, if relevant)?.....5 /NO/ /YES/
6. Before you got your worst headaches, did you know they were coming?.....6 /NO/ /YES/
7. Have you ever consulted a doctor about your headaches?.....7 /NO/ /YES/
8. What is your average frequency of headaches? (Check one)

several a day.....1	/ /	1 per week.....5	/ /
daily.....2	/ /	2-3 per month.....6	/ /
5-6 per week.....3	/ /	1 monthly or bimonthly...7	/ /
2-4 per week.....4	/ /	less than 6 per year.....8	/ /

9. How do you feel most of the time? (Check one)

very relaxed & happy.....1	/ /	somewhat tense & upset...4	/ /
somewhat relaxed & happy....2	/ /	very tense & upset.....5	/ /
neither relaxed & happy, nor tense & upset.....3	/ /		

10. Your sex?..... /MALE/ /FEMALE/

Do you associate your headaches with any of the following events?:

[redacted].....11 [redacted]

12. Getting angry?.....12 /NO/ /YES/
13. Eating particular foods?.....13 /NO/ /YES/

DEPARTMENT OF PSYCHOLOGY
OLDS HALL

EAST LANSING · MICHIGAN · 48824

Dear Student:

We need two minutes of your time to help us learn more about HEADACHES and their causes. We need your responses to the 11 brief questions below. This research is being sponsored by the Department of Psychology and a Federal Bio-Medical Research Grant.

Possibly you answered these questions last Spring Term. WHETHER YOU DID OR NOT, WE WOULD STILL LIKE YOU TO ANSWER THE QUESTIONS BELOW. However, if you already answered this questionnaire at the COUNSELING CENTER this fall, please disregard this request.

PLEASE SHARE TWO MINUTES OF YOUR TIME WITH US.

DO NOT ENTER YOUR NAME ON THIS SHEET. Your responses will remain strictly confidential.

Please place your completed sheet in the box provided. Your help will be greatly appreciated. If you have any questions, I may be reached at 332-4302.

David M. Schnarch, M.A.
Primary Investigator

Professor Donald Grummon
Department of Psychology

Professor John Hunter
Department of Psychology

1. Have you had a headache within the last year?.....1 /NO/ /YES/
2. Have you ever had a head injury where you lost consciousness?.....2 /NO/ /YES/
3. Were your worst headaches severe or unbearable?.....3 /NO/ /YES/
4. Were your worst headaches located on only one side of your head (more than a momentary stab of pain)?.....4 /NO/ /YES/
5. When you had your worst headaches, did you vomit or feel nauseous (exclude time during pregnancy, if relevant)?.....5 /NO/ /YES/
6. Before you got your worst headaches, did you know they were coming?.....6 /NO/ /YES/
7. Have you ever consulted a doctor about your headaches?.....7 /NO/ /YES/
8. What is your average frequency of headaches? (Check one)

several a day.....1	/ /	1 per week.....5	/ /
daily.....2	/ /	2-3 per month.....6	/ /
5-6 per week.....3	/ /	1 monthly or bimonthly..7	/ /
2-4 per week.....4	/ /	less than 6 per year....8	/ /

9. How do you feel most of the time? (Check one)

very relaxed & happy.....1	/ /	somewhat tense & upset..4	/ /
somewhat relaxed & happy...2	/ /	very tense & upset.....5	/ /
neither relaxed & happy, nor tense & upset.....3	/ /		

10. Your sex? ..... /MALE/ /FEMALE/
11. What service(s) are you requesting from the counseling center?
    personal counseling..... ☐
    educational/vocational testing or counseling..... ☐

APPENDIX I

ADDITIONAL FINDINGS REGARDING RELATION OF PERSONALITY TRAITS TO SEVERITY OF HEADACHE AND GENDER DIFFERENCES

ADDITIONAL FINDINGS REGARDING RELATION OF PERSONALITY TRAITS TO SEVERITY OF HEADACHE AND GENDER DIFFERENCES

At the outset of the study, it was implicitly assumed that migraine status was an important co-variant of personality characteristics. Even if unusual personality characteristics did not create migraine, it seemed likely that unusually dramatic headaches such as migraine could have impact on personality. However, results indicated few, if any, significant personality differences when the dimension of migraine status was considered. Thus, it became of interest to explore (post-hoc) the assumption that severe headache, of any type, was a meaningful co-variant of personality.

Relation of Personality and Headache Severity

To explore this assumption, the data from all migraine and tension headache Ss were combined, and analyzed along the dimension of severe vs. non-severe headache (without regard for headache type). The results of this analysis are presented in Appendix Table Three.

APPENDIX TABLE 3

CORRELATIONS OF HEADACHE SEVERITY WITH PERSONALITY VARIABLES

SCALE	Severe Headaches MEAN	S.D.	Non-Severe Headaches MEAN	S.D.	$r_{Severity}$	$r_{Corrected\ for\ Attenuation}$	$r_{Partialled}$
	(N=211)		(N=595)				
Frequency of headache	4.9209	1.3090	5.7725	1.4991	.26	.26	---
Consult doctor	.3257	.1965	.0609	.5655	.33	.33	---
General feeling	1.4093	.9535	1.1965	.8798	-.10	-.10	---
Gender					-.08	-.08	---
Age	1.5571	.6970	1.5542	.6818	.00	.00	.00
Racial background	.0524	.2228	.0501	.2602	.00	.00	.00
Class standing	1.0853	1.0701	1.0877	1.0341	.00	.00	.00
Terms at M.S.U.	1.7619	.9847	1.7726	.9342	.00	.00	-.01
Parents marital status	.2238	.5877	.2170	.6306	.00	.00	.01
Family income	2.8077	1.2514	2.7068	1.1598	.04	.04	.03
Total provocation	2.6511	.5184	2.5207	.5126	.12	.13	.09**
Minor chance annoyances	2.2899	.5624	2.2009	.5366	.07	.11	.08*
Self-opinionated people	2.6888	.7191	2.5295	.7417	.10	.11	.08*
Interpersonal encounters	3.2915	.6918	3.0935	.6531	.13	.16	.12***
Criticism	2.3649	.7579	2.2588	.7436	.06	.08	.04
Verbal aggression	1.8378	.3932	1.7695	.4043	.07	.09	.09**
Tell off (verbal aggression)	1.8752	.4933	1.8684	.4846	.00	.00	.03
Nasty (verbal aggression)	1.8100	.4701	1.6957	.4698	.11	.13	.11**
Physical aggression	1.3637	.3126	1.3069	.3060	.08	.09	.09**
Hit things (physical aggression)	1.3404	.3415	1.2838	.3286	.07	.09	.08*

APPENDIX TABLE 3 (cont'd.)

Hit people	1.4337	.5609	1.3765	.5376	.05	.06	.07*
Negativism	1.4976	.4287	1.4451	.3940	.06	.08	.04
Fear of expressing anger	1.8317	.4823	1.7606	.4575	.07	.09	.03
Negative afterthoughts	1.9961	.4931	1.9074	.5133	.07	.08	.06*
Parental discipline	1.4689	.4465	1.3446	.4198	.13	.14	.11**
Mother discipline	1.4933	.5135	1.3397	.4311	.15	.16	.11**
Father discipline	1.4443	.5550	1.3494	.5778	.07	.08	.05
Trait anxiety	2.1404	.5698	1.9138	.5199	.18	.20	.10**
Trait anxiety (neg. indices)	2.1393	.6963	1.9551	.6717	.12	.13	.04
Trait anxiety (pos. indices)	2.1412	.6020	1.8725	.5304	.21	.24	.14***
Resentment	1.7645	.4203	1.6800	.4523	.08	.12	.11**
Suspicion	1.6018	.4439	1.4824	.4182	.12	.15	.09**
Sexual experience	1.2982	.3485	1.3851	.3665	.11	.12	.10**
Self-revelation	2.1058	.6218	2.1335	.5593	-.02	-.03	-.03
Parental attachment	1.6729	.4114	1.5400	.3938	.14	.20	.15***
Dating experience	3.2721	.7877	3.1995	.8260	.04	.04	.01
Work endurance	2.1311	.4489	2.1552	.4588	-.02	-.03	-.05
Rigidity	2.0663	.5077	1.9482	.5583	.09	.11	.09**
Morality	2.4531	.9801	2.5102	1.1100	-.02	-.03	-.04
Self-concept	2.3887	.5165	2.4961	.4669	-.10	-.11	-.03
Exams give headaches	.4733	.5003	.3466	.4762	.11	.11	.03
Anger gives headaches	.4484	.4984	.2904	.4542	.15	.15	.09**
Foods give headaches	.1353	.3421	.0538	.2259	.13	.13	.10**
Dating gives headaches	.0747	.2630	.0257	.1585	.11	.11	.07*

*p < .05, r = .06; **p < .01, r = .09; ***p < .001, r = .12

Results indicate that the severe and non-severe headache groups differed with regard to several background variables, rendering them non-equivalent for comparison purposes. In examining the correlations corrected for attenuation (middle column), severe headache Ss were found to have a significantly higher frequency of headaches ($r = +.26$, $p < .001$), and a lower sense of well-being ($r = -.10$, $p < .01$) than non-severe headache Ss. Likewise, severe headache Ss were more likely to have consulted a doctor for headache treatment ($r = +.33$, $p < .001$) than Ss with mild headaches, and were also more likely to be female ($r = -.08$, $p < .05$). While the actual magnitude of these differences is extremely small, each stands as a potential intervening variable or competing explanation for any personality differences that may also exist between severe headache and mild headache Ss. Therefore, these four significantly different background variables were partialled out from the correlations of headache severity with personality characteristics. These correlations, corrected for attenuation and partialled, appear in the right hand column of Appendix Table 3.

Appendix Table 3 reveals that numerous personality traits do vary with headache severity. Severe headache Ss are significantly more readily provoked to anger ($r = +.09$, $p < .01$) than Ss with mild headaches. This finding may indicate that increased irritability may be a function of increased strain from severe headaches. Although

r does not indicate causality, the additional finding that severe headache Ss have more trait anxiety ($r = .10$, $p < .01$) tends to support this interpretation.

Severe headache Ss were also significantly more likely to express their anger in both verbal and physical means ($r = +.09$, $p < .01$, $r = +.09$, $p < .01$; respectively) than mild headache Ss. Specifically, the former group was more likely to resort to saying nasty things ($r = +.11$, $p < .01$), hitting inanimate objects ($r = +.08$, $p < .05$) and hitting people ($r = +.07$, $p < .05$), although they were no more likely to tell someone off directly ($r = +.03$, n.s.) than mild headache Ss. Severe headache Ss had more negative afterthoughts after expressing their anger than did mild headache Ss ($r = +.06$, $p < .05$), although groups were found not to differ significantly in fear of expressing anger ($r = +.03$, n.s.). This latter pair of findings may indicate that severe headache Ss regret the particular style of expressing anger they are more prone to use (ie: saying nasty things to people and hitting them), rather than particular fears about the expression of anger, per se.

Severe headache people are significantly more likely to report that their mother used withdrawal of love as a disciplinary technique than are mild headache Ss ($r = +.14$, $p < .001$). Severe headache Ss were also significantly more suspicious of other people than were mild

headache Ss ($r = +.09$, $p < .01$). The meaning of these findings is not immediately clear. Prototypic experiences with mother might cause severe headache Ss to have higher anticipation of rejection from others. When the anticipated rejection is not forthcoming from current friends, severe headache Ss may become dubious and untrusting of friendliness. On the other hand, if this speculation about the impact of prototypic interactions with mother is true, then children of "withdrawing" mothers should also exhibit a low frequency of anger expression behaviors. Thus, this line of interpretation has its own logical flaws in explaining the results.

Severe headache Ss also reported significantly stronger parental attachment than mild headache Ss ($r = +.15$, $p < .001$). The former groups also reported having more sexual contact ($r = +.10$, $p < .01$). If strong parental attachments generate guilt and conflict in people who are engaging in sexual contact, it would tend to explain the finding that severe headache Ss have more trait anxiety than mild headache Ss.

In another aspect, severe headache Ss were found to be significantly more resentful of the success and happiness of others ($r = +.11$, $p < .01$) than mild headache Ss. Moreover, the former group of Ss lead significantly more rigid and restricted life styles ($r = +.09$, $p < .01$). Thus the lifestyle of severe headache Ss may

exclude some of the experiences they covet in other people's lives.

Recalling that severe headache Ss were found to be more easily provoked to anger than mild headache Ss, severe headache Ss also reported significantly stronger tendency for anger to give them headaches than did mild headache Ss ($r = +.09$, $p < .01$). This finding is interesting in that severe headache Ss express their anger in significantly more ways than mild headache Ss, and yet they get significantly more headache from getting angry than do mild headache Ss. If the psychoanalytic theory that migraine and tension headaches are caused by repression and suppression of anger (respectively) is true, severe headache Ss should generally express less anger than mild headache Ss. However, this assumption is not supported by the data.

Severe headache Ss were also found to get more headaches from dating ($r = +.07$, $p < .05$) and foods ($r = +.10$, $p < .01$) than mild headache Ss. However, these groups were found not to differ with respect to examinations causing headaches (r +.03, n.s.).

While results indicate numerous statistically significant personality differences between people with severe and mild headaches, the magnitude of the differences was extremely small. The differences between severe and non-severe headache Ss are presented visually in Figures 8-21. Thus, while severity seems to have an impact on personality, it seems to be a rather minor one.

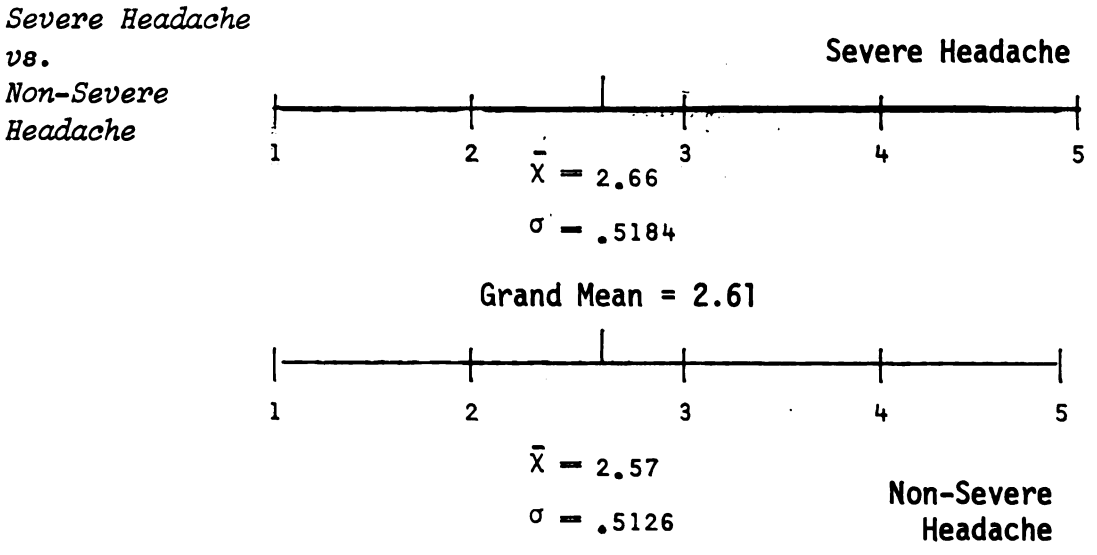

FIG. 8.--Differences between severe and non-severe headache Ss in anger provoked by items assessed in the Provocation Scale.

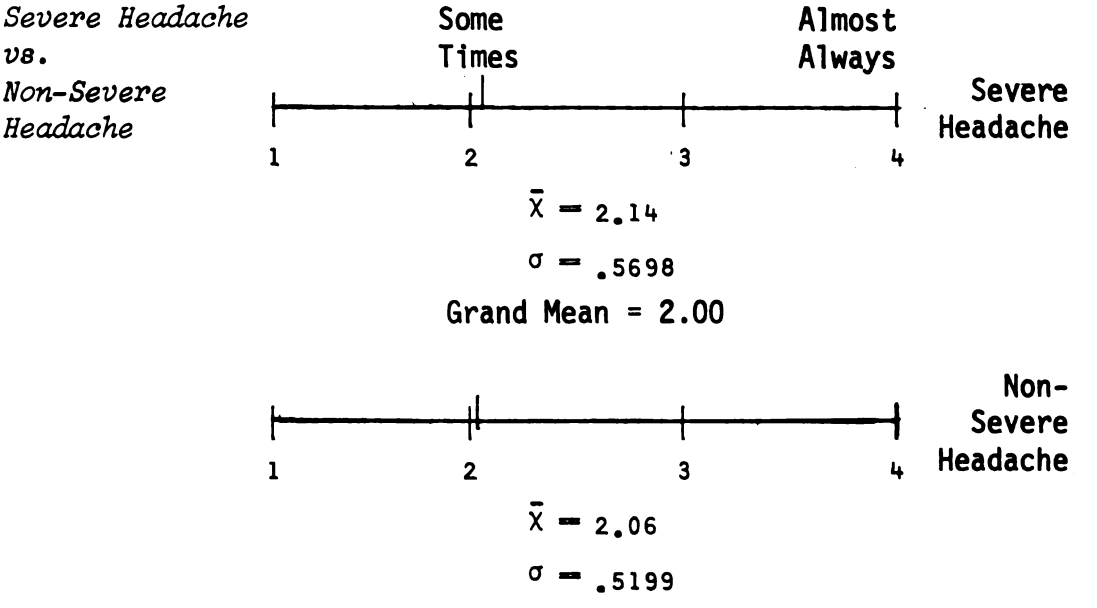

FIG. 9.--Differences between severe and non-severe headache Ss in trait anxiety.

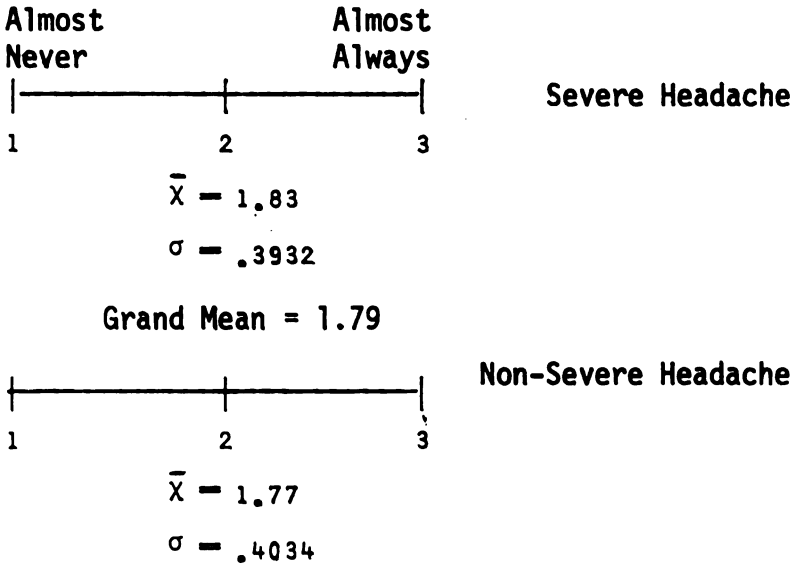

FIG. 10.--Differences between severe and non-severe headache Ss in verbal expression of anger.

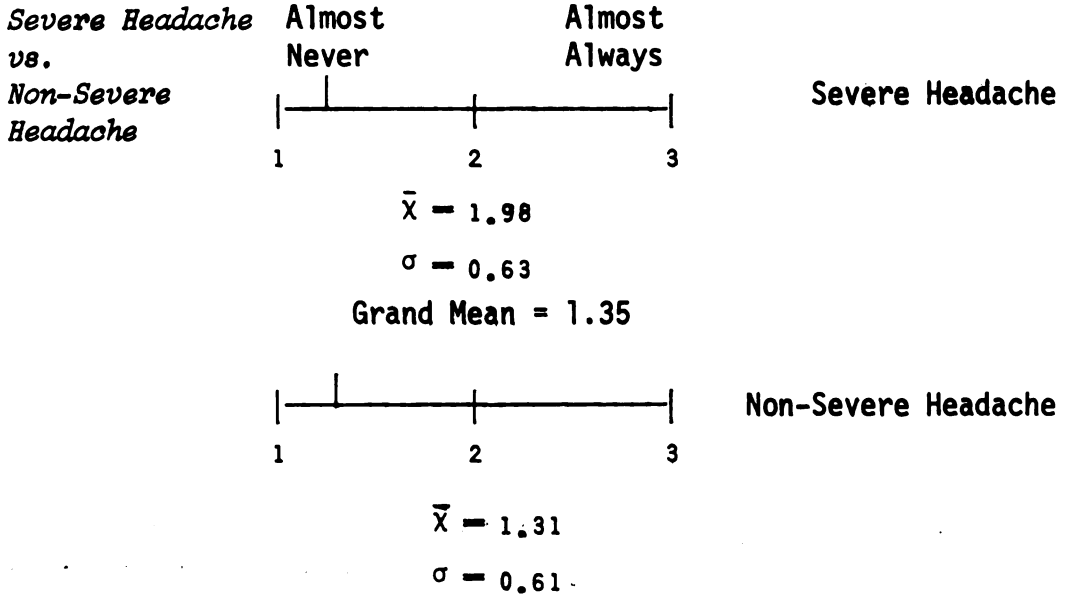

FIG. 11.--Differences between severe and non-severe headache Ss in physical expression of anger.

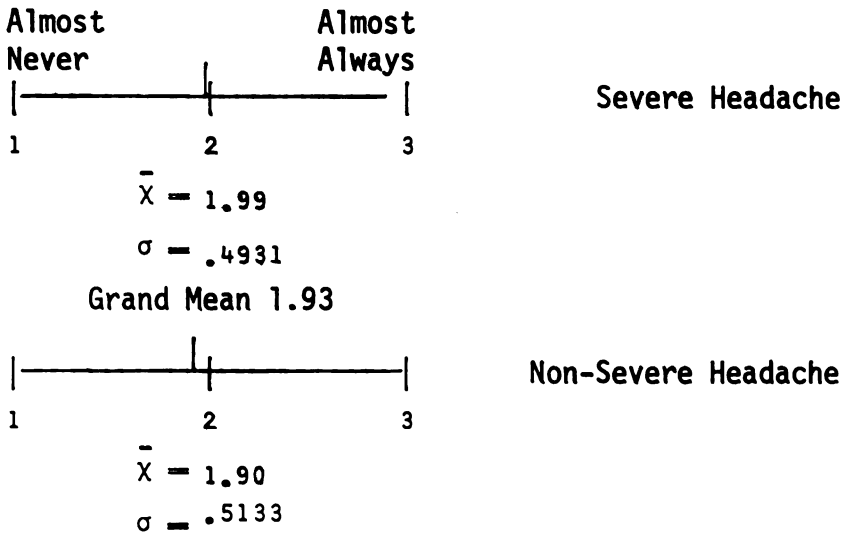

FIG. 12.--Differences between severe and non-severe headache Ss in negative afterthoughts.

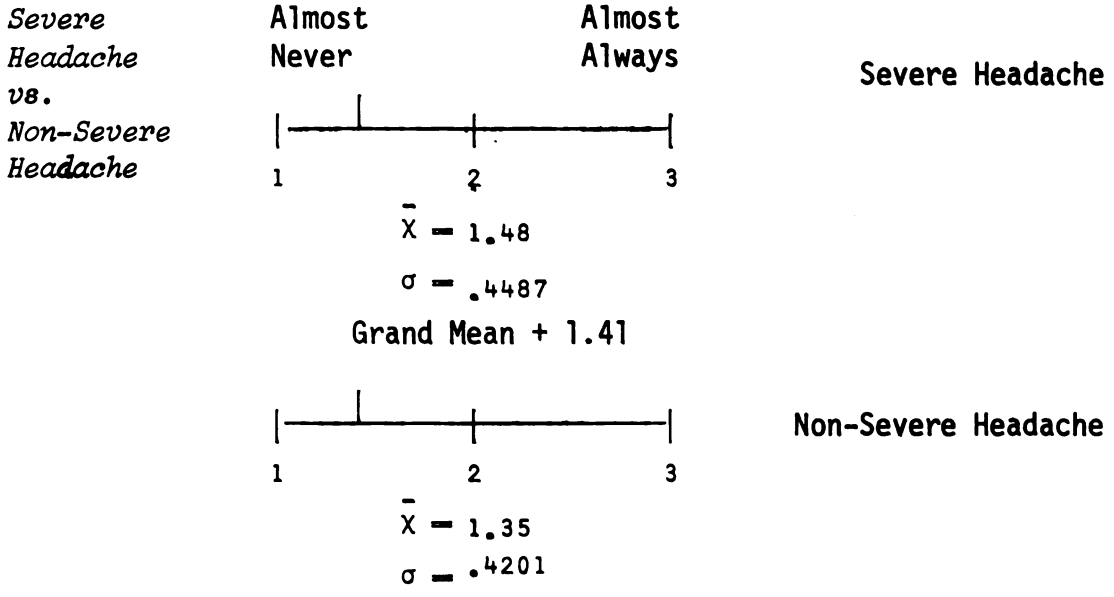

FIG. 13.--Differences between severe and non-severe headache Ss in parental use of withdrawal of love as a disciplinary technique.

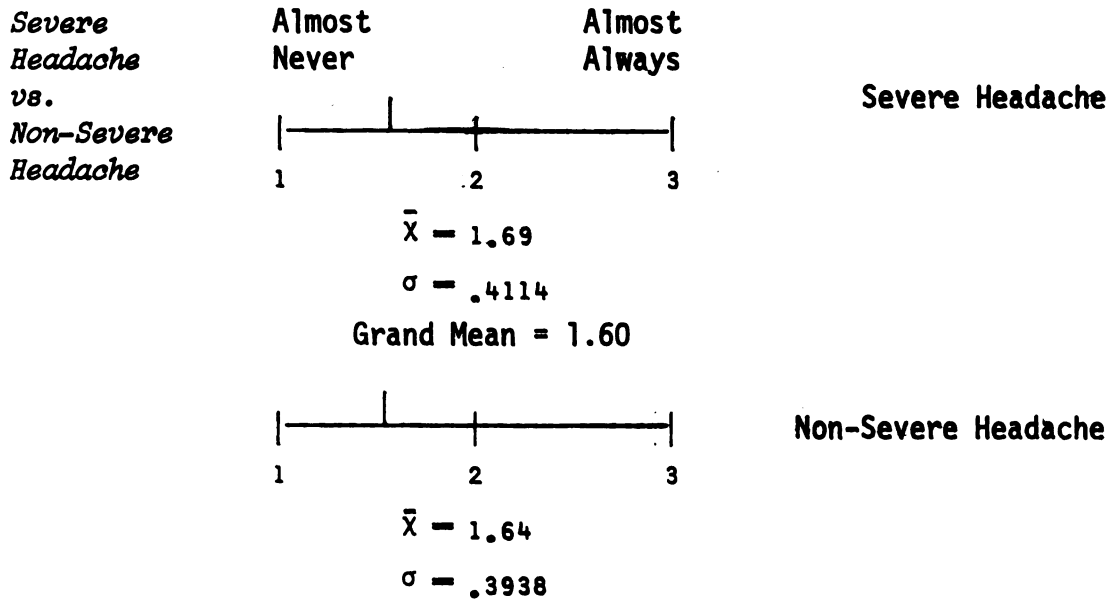

FIG. 14.--Differences between severe and non-severe headache Ss in parental attachment.

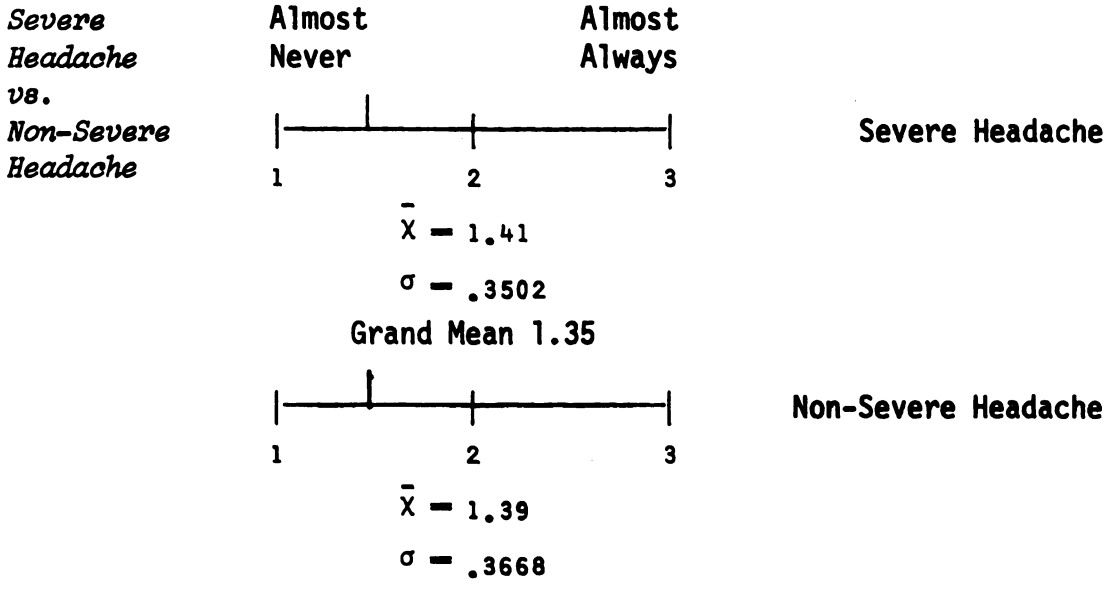

FIG. 15.--Differences between severe and non-severe headache Ss in sexual experience.

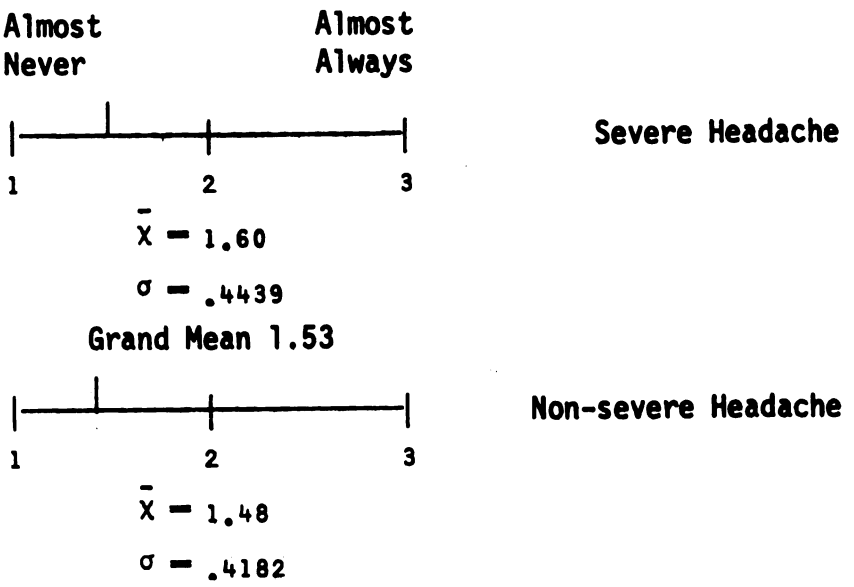

FIG. 16.--Differences between severe and non-severe headache Ss in suspicion of others.

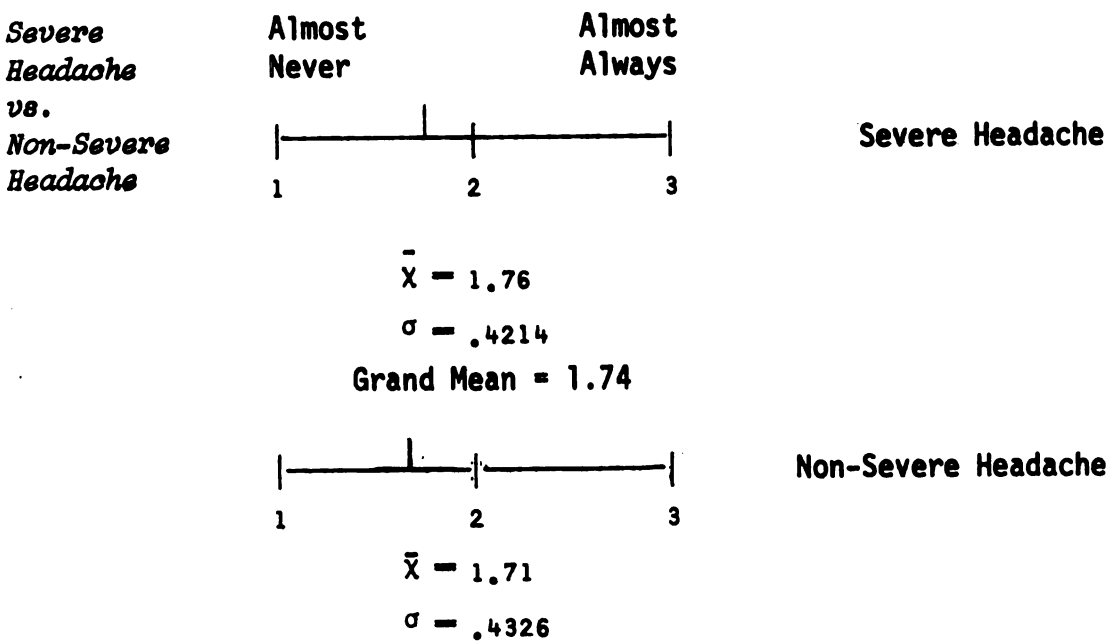

FIG. 17.--Differences between severe and non-severe headache Ss in feelings of resentment.

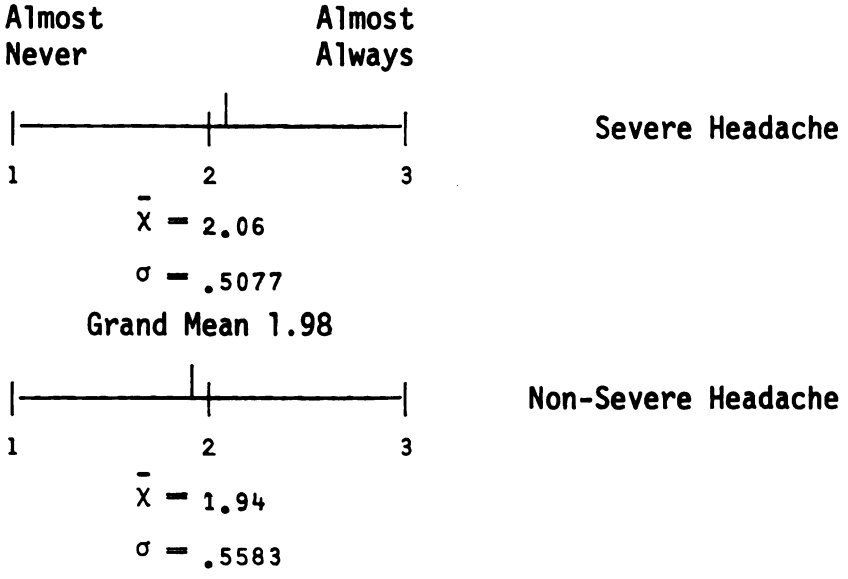

FIG. 18.--Differences between severe and non-severe headache Ss in rigidity of lifestyle.

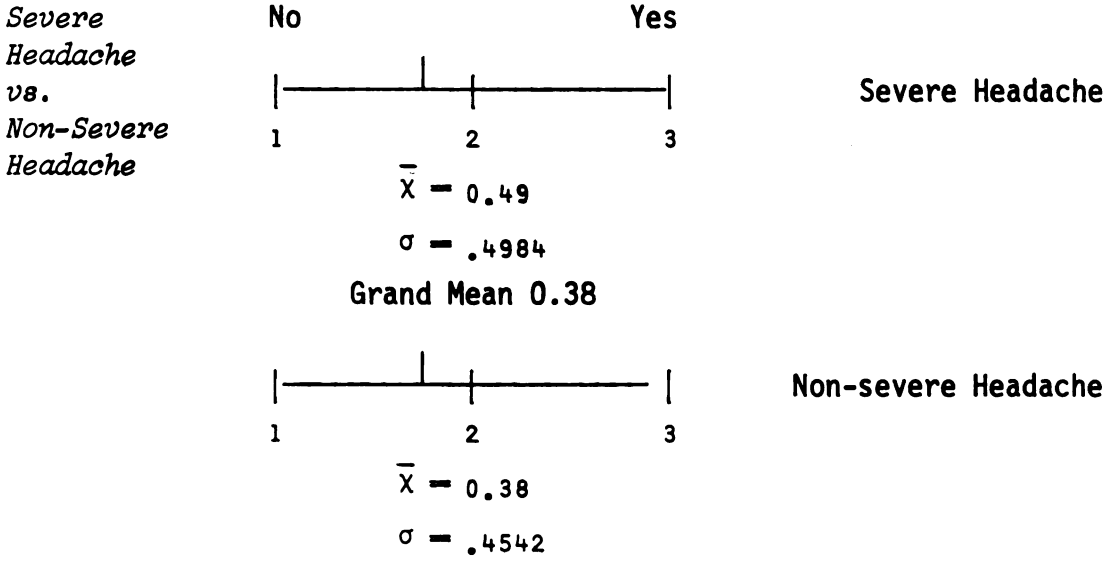

FIG. 19.--Differences between severe and non-severe headache Ss in anger causing headaches.

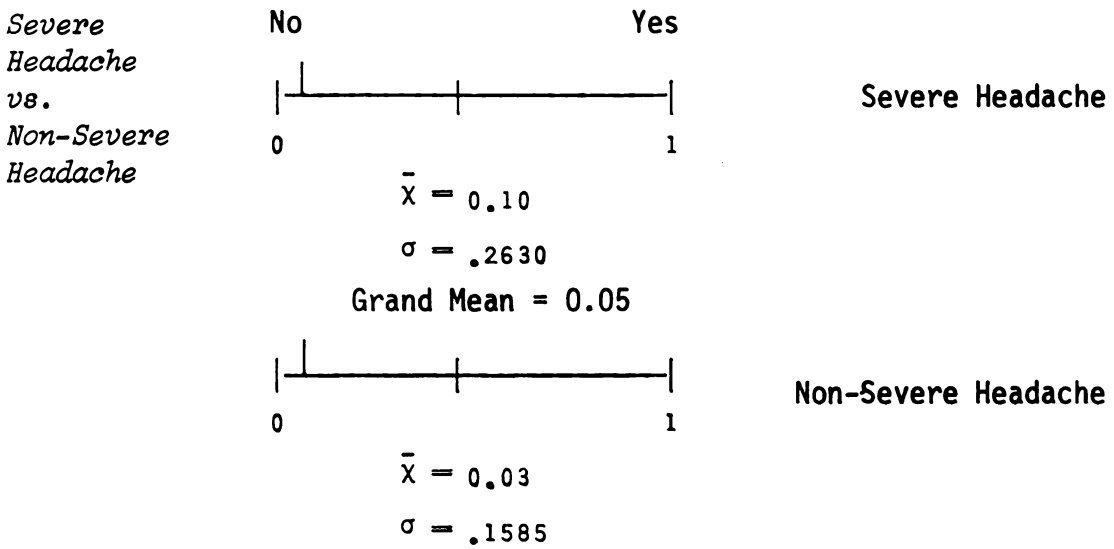

FIG. 20.--Differences between severe and non-severe headache Ss in dating causing headaches.

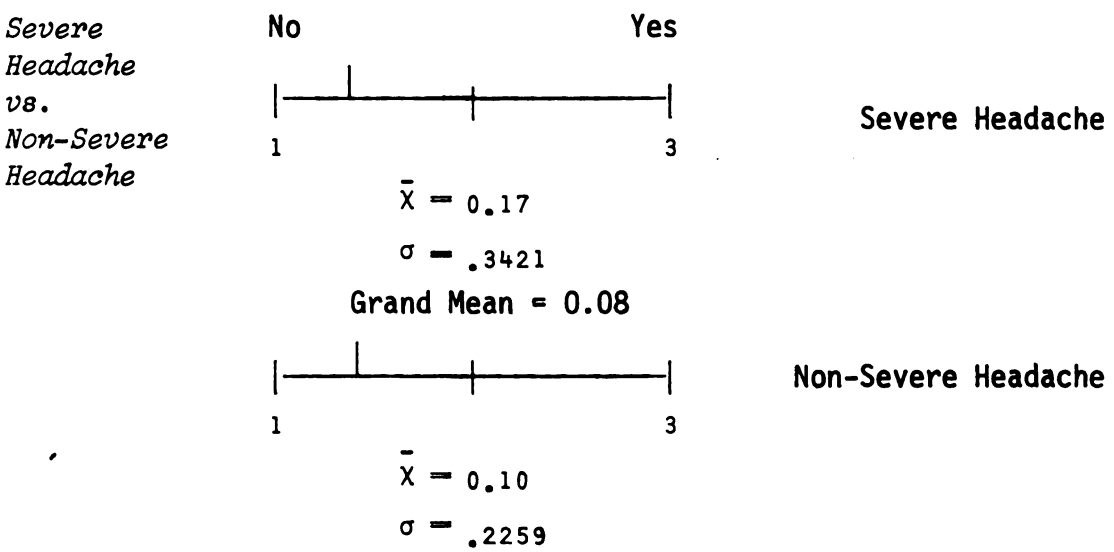

FIG. 21.--Differences between severe and non-severe headache Ss in particular foods causing headaches.

Relation of Personality and Sex Differences

The impact of sex differences on personality traits among tension and migraine headache Ss was explored. The correlations of sex with personality traits are presented in Appendix Table Four.

As can be seen in the correlations corrected for attenuation (middle column) in Table 15, males and females differed significantly on a number of background variables. Specifically, females reported significantly more frequent headaches ($r = -.15$, $p < .001$) and headaches of greater severity ($r = -.08$, $p < .05$) than did male Ss. Females were also significantly more likely to have consulted a doctor for their headaches ($r = -.07$, $p < .05$). Moreover, females were significantly younger in age ($r = -.10$, $p < .01$) and had achieved less academic rank (ie: freshman or sophomore standing) than male Ss ($r = -.09$, $p < .01$). Each of these differences, particularly those of frequency and severity of headache, could have their own additive impact on personality differences, beyond the effects of sex differences. Thus, the effects of these background variables were partialled out by statistical means to allow more equivalent comparisons of the personality of male and female headache Ss. The correlations, corrected for attenuation and partialled, appear in the extreme right hand column of Appendix Table Four.

APPENDIX TABLE 4

CORRELATIONS OF GENDER WITH PERSONALITY TRAITS

SCALE	MALES (N = 397) $\bar{X}$	MALES (N = 397) S.D.	FEMALES (N = 410) $\bar{X}$	FEMALES (N = 410) S.D.	$r_{Gender\ Scale}$	$r_{Corrected\ for\ Attenuation}$	$r_{Partial}$
Frequency of headache	5.33	1.32	5.80	1.45	-.15	-.15*	---
Consult doctor	0.13	.356	0.08	.336	-.07	-.07*	---
General well-being	1.21	.945	1.28	.909	-.04	-.04	-.08*
Headache severity					-.08	-.08*	---
Age	1.63	.735	1.48	.626	.10	.10*	---
Racial background	0.05	.236	0.05	.265	-.01	-.01	-.02
Class standing	1.18	1.06	0.99	1.02	.09	.09*	---
Terms at M.S.U.	1.79	.968	1.75	.926	.04	.04	.04
Parents' marital status	0.21	.607	0.23	.632	-.02	-.02	-.02
Income	2.74	1.19	2.73	1.17	.02	.02	.03
Total provocation	2.50	.519	2.64	.503	-.13	-.15***	-.12***
Minor annoyances	2.19	.534	2.26	.553	-.05	-.08*	-.05
Self-opinionated people	2.48	.761	2.66	.706	-.10	-.11**	-.08*
Interpersonal encounters	2.98	.655	3.31	.642	-.21	-.25***	-.23***
Criticism	2.24	.737	2.34	.757	-.05	-.06*	-.04
Verbal aggression	1.83	.406	1.75	.395	.08	.09**	.12***
Tell off	1.90	.473	1.84	.497	.04	.05	.05
Say nasty things	1.77	.480	1.69	.462	.09	.11**	.14***
Physical aggression	1.35	.322	1.29	.292	.08	.10**	.12***
Hit things	1.32	.348	1.28	.317	.04	.05	.07*
Hit people	1.45	.584	1.33	.496	.11	.13***	.14***
Negativism	1.48	.408	1.44	.398	.07	.09**	.11**
Fear expressing anger	1.76	.460	1.80	.470	-.01	-.02	.00
Negative afterthoughts	1.95	.511	1.91	.507	.02	.02	.03

APPENDIX TABLE 4 (cont'd.)

Parental discipline	1.32	.379	1.43	.469	-.10	-.11**	-.09**
Mother discipline	1.31	.416	1.44	.489	-.13	-.14***	-.12***
Father discipline	1.33	.486	1.42	.645	-.05	-.06*	-.04
Trait anxiety	1.94	.535	2.00	.548	-.06	-.07*	-.02
Negative indices	2.00	.678	2.00	.688	-.01	-.01	.03
Positive indices	1.88	.549	2.00	.569	-.11	-.12***	-.08*
Sex experience	1.37	.378	1.36	.350	.00	.00	.00
Resentment	1.73	.468	1.68	.421	.04	.05	.07*
Suspicion	1.53	.442	1.50	.415	.03	.03	.06*
Self-revelation	2.08	.567	2.17	.582	-.06	-.08*	-.08*
Parental attachment	1.52	.403	1.63	.397	-.11	-.15***	-.11**
Dating experience	3.15	.836	3.29	.793	-.07	-.08*	-.07*
Work endurance	2.15	.441	2.15	.470	+.01	.01	.01
Rigidity	1.99	.564	1.97	.532	.00	.00	.02
Morality	2.23	1.06	2.75	1.03	-.21	-.23***	-.22***
Self concept	2.48	.482	2.46	.482	.03	.04	.01
Exams give headache	0.260	.439	0.50	.500	-.20	-.20***	-.16***
Anger gives headache	0.260	.439	0.40	.490	-.11	-.11**	-.07*
Food gives headache	0.07	.252	0.08	.271	-.02	-.02	.00
Dating gives headache	0.02	.155	0.05	.221	-.07	-.07*	-.04

*p < .05, r = .06

**p < .01, r = .09

***p < .001, r = .12

These correlations reflect a slight increase in size after partialling, indicating that the partialled variables in this case had a minor masking effect on differences between the sexes. In illustration of this trend, it was only after partialling that males were found to have slightly less feeling of general well-being than females ($r = .08$, $p < .05$), that is not attributable to any differences in headache severity or frequency. Appendix Table 4 reveals other instances of 'masking' revealed through partialling. In general, however, masking effects were relatively minor.

Appendix Table Four indicates females get significantly more angry over a wide range of provoking events than males do ($r = -.12$, $p < .001$). In particular, interpersonal encounters are especially more anger-provoking for females ($r = -.23$, $p < .001$). On the other hand, males were found to express significantly more anger than females. As one might expect from social mores, men were significantly more likely to express their anger in physical ways ($r = .12$, $p < .001$), both in terms of hitting people ($r = +.14$, $p < .001$) and hitting inanimate objects ($r = +.07$, $p < .05$). Men were also significantly more likely to express their anger verbally than women ($r = +.12$, $p < .001$), especially in terms of saying nasty, indirect things ($r = +.14$, $p < .001$). No gender differences were found with regard to telling another person off directly ($r = +.05$, n.s.)

It is not true that men use overt means of expressing anger (ie: verbally or physically), whereas women use more passive-aggressive behavior to express their anger. Men used significantly more passive-aggressive methods to express their anger than did women (negativism, $r = +.11$, $p < .01$). Thus, males expressed more anger than females in every dimension explored.

Other significant differences between males and females tended to be quite small. The largest difference was found with regard to sexual morality. Females report significantly more non-permissive, conventional attitudes than males ($r = -.22$, $p < .001$). Thus females believe a stronger emotional commitment is needed for sexual contact to be "appropriate" than do males. Females also indicate significantly stronger emotional attachment to parents than males do ($r = -.11$, $p < .01$). In spite of these differences, males and females reported virtually identical levels of sexual experience ($r = .00$, n.s.)

In view of the significant gender differences in sexual morality and parental attachment, females might have shown less sexual contact than males. However, females have significantly more opportunity for sexual contact (ie: dating experience, $r = -.07$, $p < .05$), and have significantly more intimacy skills to develop the type of relationship they feel is a necessary corequisite

for sexual contact (ie: self-revelation, $r = -.08$, $p < .05$). This may explain why there was no sex difference in actual sexual contact.

Several other significant sex differences are present in Appendix Table 4. Males are significantly more resentful of the success of other people ($r = +.07$, $p < .05$) and more suspicious of others ($r = +.06$, $p < .05$) than females. Females suffer significantly more headaches from getting angry ($r = -.07$, $p < .01$) than males, and are particularly prone to headaches from examinations ($r = .16$, $p < .001$). While people who are resentful and jealous of other people's success should feel the most pressure when taking competitive examinations, results do not bear this out. Males are significantly higher on the former trait, while females are significantly higher on the latter.

Noting that females express less anger than males (although females are often more angry about the same events) and get more headaches from getting angry than males do, this may indicate that females get more headaches because they suppress their (greater) anger. Females reported having a mother who threatened loss of love more than males did ($r = -.12$, $p < .001$). Differences in child-rearing practice may predispose females to suppress their anger. However, results indicate that male and female Ss do not differ significantly with respect to fears of expressing anger ($r = .00$, n.s.)

or negative afterthoughts ($r = +.03$, n.s.). Thus, it is not clear if Ss learned that it was more acceptable for boys to express their anger openly and violently than for young girls to do likewise. It may be that males and females do not engender much fear or guilt as long as they behave in ways consistent with their gender-role models.

Significant differences in examinations triggering headaches may reflect other differences in early gender-role expectations. High test achievement may have been more expected from girls than boys during the elementary school years. Thus, females may feel more test pressure than males in later life. However, there is no data present to test this interpretation.

In a brief reference to the repression model, note that males express significantly more anger than females and yet have significantly less feeling of general well-being. The repression model would predict males who ventilate their anger should feel better than females who are more angry than males and don't express it.

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