1986

An Exploration of the Type a Behavior Pattern in Chronic Headache Sufferers.

Neil Bruce Rappaport
Louisiana State University and Agricultural & Mechanical College

Follow this and additional works at: https://digitalcommons.lsu.edu/gradschool_disstheses

Recommended Citation

Rappaport, Neil Bruce, "An Exploration of the Type a Behavior Pattern in Chronic Headache Sufferers." (1986). *LSU Historical Dissertations and Theses*. 4321.
https://digitalcommons.lsu.edu/gradschool_disstheses/4321

This Dissertation is brought to you for free and open access by the Graduate School at LSU Digital Commons. It has been accepted for inclusion in LSU Historical Dissertations and Theses by an authorized administrator of LSU Digital Commons. For more information, please contact gradetd@lsu.edu.

INFORMATION TO USERS

While the most advanced technology has been used to photograph and reproduce this manuscript, the quality of the reproduction is heavily dependent upon the quality of the material submitted. For example:

- Manuscript pages may have indistinct print. In such cases, the best available copy has been filmed.
- Manuscripts may not always be complete. In such cases, a note will indicate that it is not possible to obtain missing pages.
- Copyrighted material may have been removed from the manuscript. In such cases, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, and charts) are photographed by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps. Each oversize page is also filmed as one exposure and is available, for an additional charge, as a standard 35mm slide or as a 17"x 23" black and white photographic print.

Most photographs reproduce acceptably on positive microfilm or microfiche but lack the clarity on xerographic copies made from the microfilm. For an additional charge, 35mm slides of 6"x 9" black and white photographic prints are available for any photographs or illustrations that cannot be reproduced satisfactorily by xerography.

8710585

Rappaport, Neil Bruce

AN EXPLORATION OF THE TYPE A BEHAVIOR PATTERN IN CHRONIC
HEADACHE SUFFERERS

The Louisiana State University and Agricultural and Mechanical Col.

PH.D. 1986

University

Microfilms

International 300 N. Zeeb Road, Ann Arbor, MI 48106

PLEASE NOTE:

In all cases this material has been filmed in the best possible way from the available copy. Problems encountered with this document have been identified here with a check mark ✓.

1. Glossy photographs or pages _____
2. Colored illustrations, paper or print _____
3. Photographs with dark background _____
4. Illustrations are poor copy _____
5. Pages with black marks, not original copy _____
6. Print shows through as there is text on both sides of page _____
7. Indistinct, broken or small print on several pages ✓
8. Print exceeds margin requirements _____
9. Tightly bound copy with print lost in spine _____
10. Computer printout pages with indistinct print _____
11. Page(s) _____ lacking when material received, and not available from school or author.
12. Page(s) _____ seem to be missing in numbering only as text follows.
13. Two pages numbered _____. Text follows.
14. Curling and wrinkled pages _____
15. Dissertation contains pages with print at a slant, filmed as received _____
16. Other _____

University
Microfilms
International

**AN EXPLORATION OF THE TYPE A BEHAVIOR PATTERN
IN CHRONIC HEADACHE SUFFERERS**

A dissertation

**Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy**

in

The Department of Psychology

by

Neil B. Rappaport

B.A., San Diego State University, 1978

M.A., Louisiana State University, 1984

December, 1986

Acknowledgements

"White. A blank page or canvas.
His favorite. So many possibilities..."
(Sondheim, 1984)

One faces a multitude of blank pages during a graduate school career. Just how these innumerable pages became filled with words and ideas is still a mystery to me. As well, how this project finally reached fruition is a wonder. One thing of which I am certain is that it took the assistance and support of many people. I would like to take this opportunity to formally express my gratitude to the people who made significant contributions to the completion of this study.

First to the members of my dissertation committee: Drs. Ray Buss, Mary Lou Kelley, Arthur Riopelle, and William Waters. In many ways you taught me more about research and scientific investigation through this single experience than most other academic activities. I thank you all for providing me with such excellent role models.

Special thanks to my graduate school advisor and friend, Phillip J. Brantley, who provided me with a rich and full education. And who, for the first time in our relationship, earned more tokens than I did.

TABP and Headache

On a more personal level, I would like to thank my family and friends in New York, California, Texas, Louisiana, and Mississippi, who understood and withstood the last five years. Indeed, I am a very fortunate individual. Specifically, I thank Debra, for your strength and loyalty; Anne, for your humor and depth; CJ, for your love and support; and Sharon, for your insight and generosity.

I express my deepest gratitude to David McAnulty, my friend, colleague, and partner in this research, who provided me with the strength to persevere and gave me the knowledge to understand life.

Finally, I would like to acknowledge the contributions of my parents. They've provided love and tolerated their younger son's preoccupation with self and his wandering around the country during the past five years.

An Exploration of the Type A Behavior Pattern
in Chronic Headache Sufferers

TABLE OF CONTENTS

TYPE A BEHAVIOR PATTERN	
Historical Perspectives.....	1
Description of the Pattern.....	2
Measurement of the Pattern.....	4
Structured Interview.....	4
Jenkins Activity Survey.....	7
Relation of Pattern to CHD.....	9
Underlying Mechanisms of the Pattern.....	13
Psychological Correlates of the Pattern.....	17
Psychopathology.....	19
Type A Behavior Pattern and Stress.....	21
Type A Behavior Pattern and Social Functioning.....	23
HEADACHE CLASSIFICATION	
Migraine Headache.....	25
Symptomatology.....	25
Pathophysiology.....	28
Psychological Correlates.....	31
Muscle Contraction Headache.....	33
Symptomatology.....	33
Pathophysiology.....	34
THE PRESENT STUDY.....	35
HYPOTHESES.....	39
METHOD	
Subjects.....	41
Materials.....	44
Procedure.....	50
RESULTS.....	55
DISCUSSION.....	82
REFERENCES.....	97
APPENDICES.....	116
VITA.....	145

Abstract

Recently, investigations have examined the possible link between the Type A Behavior Pattern (TABP) and chronic headache. Several studies have indicated a significant relation between Type A, as measured by the Jenkins Activity Survey (JAS), and headache frequency. As well, several researchers have noted the similarities in the descriptions of the Type A individual and those characteristics of the "migraine personality." To date, no prospective study has examined whether that set of characteristics ascribed to migraineurs is in fact the TABP. The second focus of this investigation was to provide a comprehensive description of the psychological functioning of Type A and B headache sufferers across several domains: psychopathology, social functioning, health beliefs and behaviors, and daily stress monitoring.

Sixty chronic headache sufferers (30 tension, 30 migraine) volunteered as subjects for this investigation. Participants provided full headache histories and were diagnosed by both a doctoral candidate in clinical psychology and a neurologist according to Ad Hoc Committee criteria. All participants kept headache diaries for eight weeks and

completed several psychological questionnaires including the JAS.

Approximately fifty-three percent of migraineurs were classified as Type A (at or greater than 75th%ile) compared to only 23 % of muscle contraction headache volunteers, $p < .05$. Statistical analyses also revealed significant relations between Type A and several headache pain parameters (i.e., frequency, intensity). Statistical differences were also obtained between Type A and B headache sufferers in several domains.

Results revealed that a significant proportion of migraine headache sufferers are Type A. This strongly implies that the construct of Type A needs to be expanded beyond the traditional notion (i.e., coronary-prone) to a newer, more general conceptualization (i.e., vascular-prone). As well, significant differences on several measures of psychological functioning revealed noteworthy and insightful descriptions of Type A and B headache sufferers. Treatment implications and future investigations are highlighted.

TABP and Headache

An Exploration of the Type A Behavior Pattern in Chronic Headache Sufferers

Historical Perspectives of the TABP

It was not that long ago that medical textbooks in cardiology contained no information concerning the effects of psychological risk factors on coronary heart disease (CHD) (Caffrey, 1968). In Stamler's (1965) historical, comprehensive review of atherosclerosis, he failed to mention the possibility that psychological factors could influence CHD. The reality of the situation however is that behavior and emotion affecting the cardiovascular system can be traced back over 350 years to the writings of a British physician, Sir William Harvey. He noted in 1628 that "every affection of the mind that is attended with either pain or pleasure, hope or fear, is the cause of an agitation whose influence extends to the heart" (in Eastwood & Trevelyan, 1971, p. 290). Over two-hundred years later, Sir William Osler, another noted British physician rediscovered Harvey's writings and added "I believe that the high pressure at which men live and the habit of working the machine to its maximum capacity are responsible for arterial degeneration rather than excesses in eating or drinking" (in Jenkins, Zyzanski, & Rosenman, 1979, p. 3). Osler's

description of "the coronary-prone" patient would remain an esoteric one until the Menningers (1936) adopted this position, bringing the notion of coronary-prone behavior to the United States.

The modern notion of the coronary-prone behavior pattern--also called Type A--is an epidemiological construct that arose from Friedman and Rosenman's (1974) observations of the behavior of cardiac patients in their private practice during the 1950's. Compared with the noncardiac patients they were treating, middle-aged and younger patients suffering from cardiac disorders seemed to possess a noteworthy constellation of behavioral characteristics (Matthews, 1982). Disappointed by the failure of traditional risk factors for heart disease (e.g. hypertension, smoking, obesity, etc.) to predict half of the new cases of clinical coronary heart disease (Jenkins, 1976), they turned their attention to systematically observing that collection of behaviors that subsequently was termed the Type A behavior pattern (TABP).

Description of the Pattern

Cardiologists Friedman and Rosenman were chiefly responsible for the earliest descriptions and development of the TABP. In extreme manifestations, the pattern represents "a tightly woven tapestry of habits, goals, characteristic modes of striving and

achievement motivation, and personality traits" (Sparacino, 1979, p. 38). Individuals displaying this pattern are usually overtly competitive, aggressive or even hostile (Glass, 1977; Manuck & Garland, 1979; Nowack & Sessenrath, 1980), exceedingly demanding of self and other, and chronically restless, impatient, and time conscious (Manuck, Craft, & Gold, 1978; Lovallo & Fishkin, 1980; Carver & Glass, 1978; Irvine & Allen, 1982). According to Friedman (1969), the Type A behavior pattern refers to

"a characteristic action-emotion complex which is exhibited by those individuals who are engaged in a relatively chronic struggle to obtain an unlimited number of poorly defined things from their environment in the shortest period of time and, if necessary, against the opposing efforts of other things or persons in the same environment" (p. 84).

Jenkins (1976) further observes that the TABP represents neither "a stressful situation nor a distressed response, but rather a style of behavior with which some persons habitually respond to circumstances that arouse them (p. 1034)." The overt manifestations of Type A individual's struggle include explosive, accelerated speech, a heightened pace of living, impatience with slowness, concentrating on more

than one activity at a time, self-preoccupation, dissatisfaction with life, evaluation of the worthiness of one's activities in terms of numbers, a tendency to challenge and compete with others even in noncompetitive situations, and free-floating hostility (Matthews, 1982; Matthews & Haynes, 1986). The major facets or "core" elements of the TABP are extremes of aggressiveness, easily aroused hostility, a sense of time urgency, and competitive achievement striving (Rosenman, 1978). The extent to which Type A represents a "trait" depends on one's underlying model of a trait. Strictly speaking, the TABP is not considered to be a trait. Rather, it is a set of "overt behaviors that is elicited from susceptible individuals by an appropriately challenging environment" (Matthews, 1982, p. 293). Additionally, the TABP is not to be considered a discrete typology. Rather, it is hypothesized to be a continuum of behaviors ranging from extreme Type A to extreme non-Type A or Type B. This notion will be discussed in more detail later.

Measurement of the Type A Behavior Pattern

Structured Interview. As noted before, the initial formulation of the coronary-prone behavior pattern was based on the clinical experience of Friedman and Rosenman. Recognizing the need for improved

specification of the criteria for measuring the behavior pattern, these cardiologists developed a measure based on a structured interview (SI) (Rosenman, et al., 1964). The SI was designed to provide a suitable challenge to elicit the TABP in predisposed individuals. The SI requires about 15 minutes to administer and is audiotaped or videotaped for subsequent scoring. Both interviewers and raters must be trained to provide a standardized, valid assessment.

Rating of the SI takes into account stylistics of speech (i.e., the way something is said by the interviewee), the content of the answers (i.e., what is said), and overt psychomotor, nonverbal behaviors exhibited in the interview. Although all three factors are taken into account in the scoring, the content and nonverbal behaviors are weighed less heavily, because Type As often have little insight into their own behavior (Rosenman, 1978). Instead, emphasis is placed on the speech stylistics. The value of the stylistics for assessment of coronary-prone behavior has been confirmed (Schucker & Jacobs, 1977). Methodological studies of the SI have shown high levels of interrater reliability (Caffrey, 1968) and stability over time (Jenkins, Rosenman, & Friedman, 1968).

Type As who have been identified through the use of the SI have been shown to be at higher risk for CHD

incidence regardless of other risk factors (Brand, Rosenman, Sholtz, & Friedman, 1976; Friedman & Rosenman, 1959; Jenkins, 1971; Jenkins, 1976; Rosenman et al., 1975). This is also holds when attempting to predict the severity of atherosclerosis, the underlying coronary process (Blumenthal, Williams, Kong, Schanberg, & Thompson, 1978; Friedman et al., 1968; Dembroski, MacDougall, Williams, Haney, & Blumenthal, 1985; Zyzanski, Jenkins, Ryan, Flessas, & Everist, 1976). It seems likely that the behavior pattern is quite stable for most individuals over time. In subjects in the Western Collaborative Group Study (WCGS) and other similar smaller scale investigations, 75-80% showed a similar categorical assessment by the SI method over a period of 12 to 20 months (Jenkins, Rosenman, & Friedman, 1965; Keith, Lown, & Stare, 1965).

The SI is not an ideal measure because it is an empirical instrument that is not truly objective and does not provide numerical quantification. Moreover, as noted above, it requires a period of training for its effective administration and assessment. On a practical level as well, it requires much time and expense. In an effort to overcome some of these shortcomings, attempts have been made to develop a questionnaire which has the ability to identify

individuals demonstrating the behavior pattern. The Jenkins Activity Survey (JAS) was developed to duplicate the clinical assessment of the TABP by a more standard psychometric procedure and to make Type A assessment more accessible for researchers.

Jenkins Activity Survey. The best-studied, most widely accepted paper and pencil measure of the TABP is the Jenkins Activity Survey (Jenkins, Zyzanski, & Rosenman, 1979) which has been available in several forms since 1964 for research and clinical use with different populations. The JAS was constructed over an 8-year period; four earlier editions were available previous to the current Form C (for use with employed adults) which was published and copyrighted by Jenkins et al. (1979). Items for the JAS were derived from the SI as well as from Jenkin's observations of interview behavior and the theory of Type A behavior. The earlier forms of the JAS were administered to males who had also been rated on the SI. The 40 items that correlated best with the ratings of the SI were kept and additional new items were developed. Discriminant function analyses were used at each stage of development to select items that might best differentiate between independently assessed Type A and Type B individuals. Form C contains the 52 items that best discriminated between the two groups.

The TABP as assessed by the JAS is significantly related to CHD prevalence in many populations. JAS scores for TABP were predictive of new cases of CHD (Jenkins, Rosenman, and Zyzanski, 1974), risk of reinfarction in the WCGS (Jenkins, Zyzanski, Rosenman, & Cleveland, 1971; Jenkins, et al., 1976), and degree of basic coronary atherosclerosis in some (Zyzanski et al., 1976), if not all (Blumenthal, et al., 1978), studies. (Several researchers have noted that the Blumenthal et al. (1978) study included many persons with demographic characteristics that were substantially different from the population for which the JAS was developed and standardized.) Generally, findings from a vast literature suggest that, compared to the SI, the JAS is a somewhat weaker predictor of CHD incidence (Brand, et al., 1976) and of the physiological arousal, which is thought to be the underlying mechanism which links the behavior pattern to CHD (MacDougall, Dembroski, & Musante, 1979). The relative strength of the SI compared to that of the JAS, and other questionnaires that purport to measure the TABP, may be that the interview is based more on direct observation of the behavior pattern than upon the content of answers to questions. On balance, while the JAS is somewhat inferior to the SI when attempting to predict CHD prevalence, its use in the TABP

research literature is widespread. "In spite of the instrument's limitations, research does support its utility. It can evaluate broad group differences and provide clinical investigators with a means of assessing an important construct in proneness to CHD" (Green, 1982, p.356).

Relation of TABP to CHD

A significant relation of the TABP with CHD prevalence has been found in both sexes that could not be attributed to differences of diet or any other traditional risk factors (Friedman & Rosenman, 1959; Rosenman & Friedman, 1961). Many other studies have confirmed these first investigations (for reviews see Feinleib, Brand, Remington & Zyzanski, 1978; Rosenman & Chesney, 1980). These confirmations proved to be significant whether the pattern was measured by either the SI, or the JAS (Jenkins, Rosenman, & Zyzanski, 1979), or other measures (Bortner, 1979; Kannel & Gordon, 1974; Thurstone, 1949).

Differences of TABP may in part explain considerably higher CHD rates in the densely populated, industrialized regions of the United States and England (Sigler, 1959) compared to the farm belt, where consumption of animal and dairy fat is higher. Such differences probably also help to explain higher rates in the United States compared to Europe (Keys et al.,

1972) and in the Framingham investigation's males compared to those in Yugoslavia (Kozarevic, Pirc, Ravic, Dawber, Gordon, & Zukel, 1976), Puerto Rico and Hawaii (Gordon, Garcia-Palmeiri, Kagan, Kannel, & Schiffman, 1974), and Paris (Ducimetiere, Cambien, Richard, Rakotovo, & Claude, 1980).

The association between TABP and CHD has received major confirmation in prospective research as well. The Western Collaborative Group Study was a prospective epidemiological investigation of over three-thousand healthy males, aged 39-59 years at intake in 1960-1961, who were employed by 10 California companies (Rosenman et al., 1964). Participants were comprehensively studied for all traditional health risk factors. The most detailed descriptions of the population and methodology can be found in Rosenman et al. (1964), as well as the findings at follow-up (Rosenman, Brand, Jenkins, Friedman, Strauss, & Wurm, 1975; Rosenman, Brand, Sholtz, Friedman, 1976).

The 8.5 year follow-up found CHD in 257 men. Final results showed that men classified as Type A at intake were 2.37 times as likely to develop CHD over the follow-up period as were Type B individuals (Rosenman et al., 1975). This relation was later statistically adjusted to reflect the impact for other risk factors and the relative Type A/B risk of CHD was

reduced to 1.97. The significant adjusted figure, 1.97, represented the relative risk for TABP that was independent of other risk factors. These findings indicate a synergistic pattern for CHD risk in which the TABP operates with nearly constant multiplicative effect applied to whatever background level results from other risk factors. Both of the observed associations, adjusted and non-adjusted risk ratios were statistically significant, $p < .001$, and therefore could not be attributed to chance fluctuations; these results were also quite comparable to the findings of the later Framingham investigation (Haynes, Feinleib, & Kannel, 1980).

The Framingham Study (Kannel & Gordon, 1974) yielded a multivariate risk equation for CHD prediction based on standard risk factors. The predicted risk levels in the Framingham data correlated highly with those obtained in the WCGS. The findings demonstrated a direct association between CHD incidence and the TABP of an approximate risk ratio of 1.9, $p < .0006$, and 2.1, $p < .002$, for Type A to Type B males, aged 39-40 and 50-59 years, respectively. Thus, substantial risk is associated directly to the pattern and does not diminish as individuals become older.

In the WCGS the association of TABP with CHD incidence prevailed for initial myocardial infarction

(MI), whether symptomatic or not, as well as for angina pectoris (Rosenman et al., 1975). Although significant CHD incidence occurred in Type A men even at low risk factor levels, Type B individuals at similar levels exhibited relative CHD immunity (Rosenman, Friedman, Jenkins, Straus, Wurm, & Kositchek, 1966). The TABP also was strongly associated with recurring and fatal CHD events (Jenkins et al., 1976; Rosenman et al., 1966).

Subsequent investigations have confirmed the relation between the coronary-prone behavior pattern and CHD incidence. As part of the study of CHD among Japanese men in Japan, Hawaii, and California, over two thousand males completed the JAS in 1967-1968 (Cohen, Syme, Jenkins, Dagan, & Zyzanski, 1975). Among the most interesting findings of this investigation were (a) Japanese men in Hawaii who were classified as having undergone cultural change were more prone to CHD and (b) those individuals who were both culturally mobile and Type A had two to three times the CHD risk at follow-up (Brand, 1978). These results support the initial TABP construct as being an interplay between specific behaviors and an environment that challenges the susceptible individual.

Major confirmation of the relation between CHD and the coronary-prone individual was obtained in the

follow-up to the Framingham Study (Haynes, Feinleib, Levine, Scotch, & Kannel, 1978). A cohort of nearly 2,000 individuals was administered an extensive questionnaire in 1965-1967 that provided measures of behavior, situational stress, sociocultural mobility, and somatic strain. Among these psychometric instruments, the Framingham Type A Scale, was significantly related with CHD prevalence in both sexes, even after controlling for other risk factors. Subjects aged 40-74 and free of CHD ($n = 1674$) were then followed for an additional 8 years. During this follow-up period, Type A males were found to be over twice as likely as Type Bs to develop angina and suffer MIs, with stronger associations in white- than in blue-collar workers (Haynes, Feinleib, & Kannel, 1980). These associations were still significant when statistically adjusted in order to control for other risk factors. In fact, the respective incidence of angina and MI was 3.32 and 2.14 higher in Type A men than Type B women.

Mechanisms Underlying the TABP and CHD

As previously noted, the TABP has been found to be associated not only with an increased incidence of acute CHD clinical events (MI and sudden death) but also with increased levels of the underlying pathological process, coronary atherosclerosis. These

associations suggest the existence of mechanisms that link psychobehavioral processes, most likely via central nervous system mediation, with those processes involved in the formation of the atherosclerotic plaque. Extensive laboratory, clinical, and epidemiological evidence suggests that such mechanisms involve (a) hormonal and lipid responses, and (b) physiological responses, both associated with varying behavioral states.

A number of studies by Friedman, Rosenman, and their co-workers have shown that extreme Type A persons exhibit exaggerated hormonal and lipid responses to various psychological and behavioral challenges. Type A individuals have generally been found to have higher levels of serum cholesterol than their Type B counterparts, both prior to the emergence of clinically evident CHD (Friedman, Byers, Rosenman, & Elevitch, 1970) and after the clinical stage is reached (Blumenthal et al., 1978). With regard to sympathetic nervous system function, Type A subjects have been found both to excrete increased amounts of norepinephrine during a typical work day (Friedman, St. George, & Byers, 1960) and to show elevated serum norepinephrine levels during a challenging competitive task (Friedman, Byers, Diamant, & Rosenman, 1975).

There is now a rapidly growing body of research from several laboratories concerned with identifying differences in psychophysiological responses between Type A and Type B individuals. This research is the logical extension of the earlier work with regard to enhanced excretion or secretion of catecholamines among Type A persons. If it was reliably demonstrated that Type A individuals exhibited excessive sympathetic arousal in response to specific challenge, an important step will have been taken toward defining the mechanisms through which behavior plays a role in the pathogenic process in CHD (Williams, Friedman, Glass, Herd, & Schneiderman, 1978).

Dembroski, MacDougall, Shields, Petitto, and Lushene (1978) studied the physiological response of 50 Type A and Type B subjects who were challenged to respond rapidly and accurately on three tasks involving either perceptual-motor or cognitive skills. In general, it was found that Type A subjects showed significantly greater cardiovascular changes indicative of sympathetic nervous system arousal than did Type B subjects. In addition, it was found that increased levels of hostility or competitiveness during the SI were predictive of heightened physiologic responses during the tasks. Using a similar set of challenging tasks, Manuck, Craft, and Gold (1978) found Type A

males to show greater systolic blood pressure elevations during task performance in comparison to Type B participants.

In an extension of earlier work, Dembroski, MacDougall, Herd, and Shields (1978) subjected Type A and B participants to the cold pressor test and a reaction time test under conditions of both high and low challenge. They found that Type A subjects were more physiologically responsive overall, though this effect was most pronounced under high-challenge conditions. When the subjects were re-classified with regard to level of hostility and competitiveness, it was found that, in contrast to Type B individuals, Type As who also displayed competitiveness and hostility were hyperresponsive to both low- and high-challenge instructions during both tasks. In addition to the differential effect of hostility and competitiveness on the physiological responses of Type A as compared to Type B subjects demonstrated in this study, Scherwitz, Berton, and Leventhal (1978) found that high levels of self-involvement (measured as the simple frequency of use of personal pronouns during the structured interview) were related to elevated levels of cardiovascular responses across a wide variety of experimental tasks among Type A but not Type B subjects.

In addition to these empirical studies, it has been proposed (Williams, 1975) that both alpha-adrenergically mediated vasoconstrictor responses during sensory intake, or vigilance behaviors and beta-adrenergically mediated cardiac output responses during mental work or emergency situations, are two potential mechanisms whereby physiological responding during qualitatively different behavioral states contribute both to the atherosclerotic process and to the precipitation of acute clinical events. Ongoing studies have recently produced evidence which supports this hypothesis. Whether the behavior pattern is assessed by the SI or JAS, Type A male undergraduates show a significantly larger increase in forearm blood flow and a larger increase in plasma epinephrine and cortisol than do Type Bs during a challenging mental arithmetic task (Williams, 1975).

Psychological Correlates of the TABP

There are a number of reasons why the psychological correlates (i.e., those psychological constructs such as anxiety, assertiveness, hostility, introversion, locus of control, etc.) of the TABP are important to investigate. From an epidemiological perspective, it is important to ascertain in a precise manner those components of the TABP which are chiefly responsible for the detrimental effects of the pattern.

Research has demonstrated that not all those individuals identified as Type A develop CHD or any other of the other related cardiovascular disorders (Eysenck & Fulker, 1983). Secondly, from a treatment point of view, it is important to be able to describe the psychological functioning of Type As and Bs. If the way Type As behave is detrimental to their health, it is crucial that we determine before treatment, what in fact it is we are attempting to alter. Describing how Type As differ from Type Bs is of utmost importance in order to accomplish this task. Whether we take angry, hostile, unassertive As and make them Bs or non-angry, non-hostile, assertive Type As is still an unanswered question. Unfortunately, the quality of research in this area of TABP is certainly the poorest. It is unfortunate that the Type A/B distinction has previously tended to develop in isolation from mainstream psychological research. What will follow is a review of the research investigating the psychological correlates of the TABP.

The developers of the Type A concept have emphasized that the behavior pattern is not a reflection of stress, anxiety, or any other psychological disturbance (Jenkins et al., 1979). Recent reviews have noted that there is a need for a more comprehensive view of the TABP than exists today

(Eysenk & Fulker, 1983; Matthews, 1982). There is a need for it to be related to other, well-established constructs, and, for it to be related to modern theories of psychology (Gilbert & Reynolds, 1984). Studies to date that have evaluated the relation of the construct to well-established personality measures have generally been limited in number and weak in design. For example, Irvine, Lyle, and Allon (1982) found significant correlations between Eysenck's measure of neuroticism and both the Type A and Speed-Impatience scales of the JAS in a small sample ($n = 37$). Eysenck and Fulker (1983) found both the Extraversion and Neuroticism factors of the Eysenck Personality Questionnaire to correlate significantly with another unvalidated measure of the TABP. Lovallo and Pishkin (1980) found Type As categorized by the SI to be higher in neuroticism than Bs.

Psychopathology

A small controversy within the Type A literature began when Irvine et al. (1982) published their results. They concluded that Type A was psychopathology. This conclusion provoked many researchers in the field to attempt to replicate Irvine et al.'s (1982) results (or rather, attempt to fail to replicate their results!). Chesney, Black, Chadwick and Rosenman's (1981) results a year earlier reached

just the opposite conclusions. Chesney et al. (1981) found no differences between Type As and Bs ($n = 384$) on neuroticism, anxiety (STAI), and depression and somatization scales of the SCL-90R. These authors concluded that "there is little relationship between the TABP and 'psychological distress'" (Chesney et al., 1981, p. 225). Wadden, Anderton, Foster, and Love (1983) attempted to study these same relations. They explored the relation between the JAS scales and psychopathology as measured by the MMPI. Results indicated that the JAS Type A scale did not correlate significantly with the MMPI "neurotic" scales. The Type A scale however did correlate significantly with other MMPI scales, but all the correlations were negative, demonstrating an inverse relation between Type A behavior and psychopathology (Wadden et al., 1983). Unfortunately, the subjects in this study were a "mixed lot;" they were recruited from various hospital clinics, with some patients diagnosed with essential hypertension and various other cardiac-related risk factors, none of which were controlled experimentally nor statistically. Still, these findings were in direct opposition to the claims of Jenkins et al. (1979) who still claimed that the TABP was unrelated to psychological disturbance.

Although the sample size in the Chesney et al. (1981) study was certainly adequate, the population represented is certainly questionable; subjects were employed males without any known history of CHD or any other cardiovascular disorder. This implies that while these subjects might have been classified as Type A, they probably were not truly representative of a clinical sample of Type As, i.e., subjects identified as having some cardiovascular dysfunction. This is the major flaw in most of the research in this area. Almost all the studies reviewed, attempting to discover possible correlations (and therefore descriptions) between the TABP and other psychological concepts have used non-clinical, often undergraduate, populations. The generalizability of these studies is certainly questionable. Although Jenkins and his co-workers advocate further investigations of the psychological correlates of the TABP, to date, no empirical study using a clinical sample of Type As, classified by a validated measure of the construct, has investigated this important domain.

TABP and Measures of Stress and Health Behaviors

Although the major hypothesis linking the TABP with CHD and other cardiovascular disorders is concerned with excessive sympathetic nervous system arousal, a second hypothesis has gained some attention.

It suggests that Type As fail to perceive physical symptoms and thus chronically overexpose themselves to stressors (see Hart, 1983 for a comprehensive review of this hypothesis). Moreover, Type A individuals may experience an inordinate delay in seeking medical care after the onset of cardiac-related symptoms, which in itself is a risk factor of CHD (Carver, Coleman, & Glass, 1976). Laboratory and field studies have also extended the notion that Type As fail to report physical symptoms (Burke & Weir, 1980; Hart, 1983; Matthews & Carra, 1982; Weidner & Matthews, 1978). To date, no investigation has attempted to prospectively study differences between Type A and B individuals as they monitor daily stressors. This is due in large part to the lack of a valid instrument to measure daily stress, but also to the fact that this second hypothesis is generally overlooked in the experimental literature.

All of these findings imply potential differences between Type As and Bs on dimensions of illness behaviors. To date however, no empirical study has examined systematic differences between Type A and B individuals on reliable measures of illness behaviors and beliefs. If significant differences exist between these two groups, one could speculate that current

intervention strategies for Type A individuals could benefit from this new treatment component.

TABP and Social Functioning

Perhaps the most active research area in TABP involves the assessment of social skills. Researchers have hypothesized that interpersonal skill deficits among Type As may account for the development and maintenance of the hostile style and overtly competitive beliefs and interactions that characterize the pattern (Watkins, 1986; Watkins & Eisler, 1986). The mechanisms by which interpersonal inadequacy affects physical health have begun to be examined. For instance, some researchers have suggested that socially unskilled individuals may fail to develop social support systems. Berkman and Syme (1979) describe a relation between lack of social support, stress symptoms, and early mortality. Cobb (1976) also presents evidence that supportive interactions protect people from some of the health consequences of stress.

Early TABP intervention studies (Roskies, Kearney, Spevack, Surkis, Cohen, & Gilman, 1979; Roskies, Spevack, Surkis, Cohen, & Gilman, 1978; Suinn & Bloom, 1978) were based largely on anxiety reduction models. These studies generally failed to produce any significant reduction in the magnitude of the behavior pattern. Consequently, this strategy was dropped.

Later component studies (e.g., Levenkron, Cohen, Mueller, and Fisher, 1983) attempted a number of intervention strategies to alter the pattern (e.g., time-urgency elements). These studies as well, failed to alter the pattern. Most recently, studies have attempted to change hostility and anger magnitude measures, instead of the TABP per se (Thurman, 1985). Thurman (1985) suggests that that training Type A individuals in more appropriate interpersonal styles could have a significant effect on the pathological aspects of the pattern. At this time, no study has systematically examined differences between As and Bs on these important parameters. If the proposed study is successful in demonstrating reliable differences on social functioning dimensions (e.g., assertion, social avoidance, fear of negative evaluation), new treatments for altering these components will be developed.

Overview of Headache Classification

Cecil's Textbook of Medicine (Beeson, McDermott, & Wyngaarden, 1979) notes that the headache is the most common of all physical complaints. Andrasik, Blanchard, Arena, Saunders, & Barron (1982) reported that this widespread pain complaint has the highest prevalence across virtually all levels of social class, age, race, education and intelligence. Approximately ninety percent of all individuals have reported headache symptoms or problems during particular periods in their lives. Adams, Feuerstein, and Fowler (1980) noted that an estimated 42 million Americans suffer from headaches; that number they point out is nearly equivalent to the common cold. The Ad Hoc Committee on Classification of Headache (1962) established fifteen different categories of headaches, which included migraine and muscle contraction headaches, sinus headaches, and a variety of headaches resulting from organic bases. As noted previously, because almost all individuals suffer headaches from time to time, there is a large subgroup of the general population classified as chronic headache individuals. These individuals suffer from headaches on a regular basis over months or years. Because behavioral researchers have been involved almost exclusively with the first two syndromes (muscle contraction and migraine), no

further discussion of other headaches would be appropriate here.

The issue of reliable diagnosis of headache has not yet been settled. That is, although a reliable set of diagnostic criteria have not been fully established and accepted by the medical and psychological community, a workable clinically-relevant set of diagnostic criteria were proposed by the Ad Hoc Committee (1962). These criteria have also become the diagnostic criteria used in most scientific investigations regarding headaches.

The following discussion of the pathophysiology and clinical symptomatology of muscle contraction and migraine headaches is aimed at providing sufficient information to link the TABP with headache research. In the case of migraine headache, an additional section regarding the personality variables associated with that vascular syndrome has been included. For full literature reviews see Adams, Feurstein, and Fowler (1980) for migraine and Andrasik et al. (1982) and Williamson (1981) for muscle contraction headaches.

Migraine Headaches

Symptomatology. The Ad Hoc Committee (1962) identified five types of vascular headaches: classic and common migraines, cluster headache, hemiplegic migraine, and lower-half headache. The vast majority

of vascular headache patients are classified as either classic or common migraine (Williamson, 1981) whereas the other types have been rarely investigated.

Migraine is characterized by severe, throbbing pain that has a unilateral or one-sided locus at onset. The most common locations of pain are near the temporal, orbital, supraorbital, or occipital regions of the head. For some patients, the pain may remain localized and for others, it may radiate to other areas. The pain usually lasts for 4-8 hours, though many individuals report headache bouts of up to several days. The frequency of headache has been reported to range from two or three per week (or more) to less than one per year. Most migraine patients report that head pain is often accompanied by nausea and vomiting; it should also be noted that often patients report feeling better following a vomiting episode. Other common features of the migraine headache include: anorexia, hypersensitivity to light, sound, odors, constipation or diarrhea.

Migraineurs are often further classified as either common or classic. The classic migraine headache sufferer reports experiencing "warning signals" or prodromes before the headache phase. The prodromal signs include blind spots in the visual field, flashing lights, vertigo, parathesias of the face or hands, etc.

Common migraine has all of the same characteristics except there is not a clearly defined prodromal phase. About 85% of migraineurs are classified as common and their pain duration seems to be slightly longer as compared to classic migraine sufferers (Adams, Feuerstein, & Fowler, 1980).

Pathophysiology. Early psychophysiological research in this area revealed migraine to be of vascular origin (Tunis & Wolff, 1952); extra- and intra-cranial artery vasoconstriction during the preheadache phase followed by hypervasodilation during the headache attack (Andrasik et al., 1982). Although some of the aspects of this simple model have not been supported in empirical studies of migraine for various reasons (ie. poor methodologies, equivocal results, poor control groups, inadequate descriptions of diagnostic procedures), scientists and practitioners alike are still convinced that the predominant end organ system of the migraine attack lies in the vascular system. That is, migraine headache is a dysfunction of the cranial vascular beds (Bakal, 1975; O'Brien, 1971).

Graham and Wolff (1938) were the first to show that the pulsations of the temporal artery are increased during the headache phase of migraines. Their work was based on observations of the effect of

ergotamine tartrate on extracranial vessels in the relief of migraine. The ergotamine diminished the increased amplitude of the arterial pulsation, with corresponding relief of the headache. These results seemed reasonable in view of work with histamine, which had clearly shown that stretched extracranial arteries are capable of producing pain (Clark, Hough, & Wolff, 1936). The above discoveries laid the foundation for the vascular theory of migraine.

An accident involving an angiogram with a patient (Dukes & Vieth, 1964) while having a migraine attack demonstrated for the first time the "biphasic" nature of migraine. In recent years, investigators have postulated that an agent, or agents, causing vasoconstriction may initiate the headache sequence. Sicuteri (1967) proposed that such substances as amines, including epinephrine and norepinephrine, and serotonin--all potent vasoconstrictors--were responsible. Further evidence was found that during the migraine attack itself, some subjects secrete increased amounts of catecholamine end products (Sicuteri, 1967).

Based upon the vascular, biochemical and neurological mechanisms that have been postulated as having some relation to the etiology of migraine, Diamond and Dalessio (1978) have formulated the

"unified theory of migraine." Although their conceptualization accounts for a large number of the components of the disorder (i.e., biphasic aspect, vasodilation of cranial arteries, pulsating pain, etc.) a major deficiency is that it "emphasizes pathophysiology and minimizes the role of environmental, psychological, and behavioral factors in the etiology of migraine" (Williamson, 1981, p. 169). Because migraine is viewed by most researchers as a psychophysiological disorder (i.e., one that has psychological as well as physiological aspects), the model has been re-proposed by Cinciripini, Williamson, and Epstein (1980) as the "biobehavioral theory of migraine" which now integrates the early biological research with the later behavioral findings into a single theoretical framework. The new model introduces the relation of "stress" and other psychological constructs (e.g., inadequate coping strategies, possible reinforcement of pain reporting and other "illness behaviors," etc.) into the possible causes and maintaining factors associated with migraine headaches. Because this new model addresses a wider scope of etiological factors, no conclusions can yet be reached regarding its adequacy. It has however served as a guide for subsequent research which hoped to link the psychological and physiological components of migraine.

Psychological Correlates. The traditional psychosomatic literature is replete with characterizations of "the migraine personality." The stereotype of the migraine sufferer is that of a "tense, driving, obsessional perfectionist, with an inflexible personality, who maintains a store of bottled up resentments which neither can be expressed nor resolved" (Henryk-Gutt & Rees, 1973, p. 142). Dalessio (1972) noted that 90% of the migraineurs he has treated were overly ambitious and preoccupied with achievement and success. Almost all attempted to dominate or overcontrol their environments usually through acquisition of power. He added "many of these driving individuals said they had lost the ability to 'feel tired'. With few exceptions they were overtly perfectionistic, persistent and exacting, attempting always to arrange or bring order wherever possible" (Dalessio, 1972, p. 369).

Although the notion of the "migraine personality" has been "the clinical lore" for many years, empirical investigations attempting to scientifically confirm the existence of this "personality profile" have usually failed. Equivocal results have been the general rule (Cuypers, Altenkirch, & Bunge, 1981; Henryk-Gutt & Rees, 1973; Kudrow & Sutkus, 1979; Rogado, Harrison, & Graham, 1974; Waters & O'Connor, 1971), with most

researchers suggesting that poor methodology (i.e., poor headache diagnostic criteria, using only a limited headache population, the lack of an appropriate non-headache control group, and use of non-standardized interviews or procedures) has been the major problem with these studies (Harrison, 1975; Kudrow & Sutkus, 1979). Still others hold the view that the "migraine personality" is simply a biased sample of pain complainers who seek medical attention for their head pain (Phillips, 1976).

Some support for the position that "personality" may be a factor in the etiology of migraine is received from studies that have shown that migraineurs generally are not exposed to more stressors than non-headache controls but that they may demonstrate a more adverse emotional reaction to stress (Andrasik, Blanchard, Arena, Teders, Teevan, & Rodichok, 1982; Henryk-Gutt & Rees, 1973). It is becoming apparent that what might have been considered to be a "personality" or a specific grouping of traits, is instead, the tendency for the TABP to occur with high frequency within the vascular headache population. This would explain why practitioners report this phenomena yet empirical studies attempting to measure "psychopathology" usually come up with inconsistent findings. What was suspected to be a constellation of "personality traits" may very

well be instead, the "tightly woven tapestry" (Sparacino, 1979) that Rosenman and Friedman have written about prolifically.

Muscle Contraction Headache

Symptomatology. Muscle contraction or tension headache was described by the Ad Hoc Committee (1962) as "an ache or sensation of tightness, pressure or constriction; widely varied in intensity, frequency and duration; sometimes long lasting; commonly occipital; and associated with muscle contraction in the absence of permanent structural change; usually as part of the individual's reaction to life stress." More recently, Olton and Noonberg (1980), in a review of the adjectives used to describe muscle contraction headaches, found that such statements as "tightness," "pressure," "soreness," and "tight band" were most commonly reported. It has further been suggested that the pain in this type of headache is dull, occasionally changing to a throbbing ache, and is usually bilateral (Appenzeller, Feldman, & Friedman, 1979). The location of the pain varies greatly, and, though generally occipital, it may radiate to the temporal, parietal, or frontal regions (Friedman, 1979).

Studies of headache sufferers' diaries have provided information relative to the characteristics of muscle contraction headache (Cohen & McArthur, 1981;

Friedman, 1979; Raskin & Appenzeller, 1980).

Specifically, it has been found that the duration of these headaches may range from a few hours to weeks or months of constant pain, with the time of onset most often between the hours of four and eight A.M. and P.M. (Diamond & Dalessio, 1978). A significant proportion of muscle contraction headache sufferers report that their headaches increase in severity as the day progresses (Appenzeller et al., 1979).

Pathophysiology. Various theories have been offered to explain the origin of the pain in tension headache (Dalessio, 1978; Diamond & Dalessio, 1978; Kudrow, 1978; Wolff, 1963). All of these views share one thing in common: the importance of abnormal contractions of head muscles. Wolff and his co-workers (Wolff, 1963; Tunis & Wolff, 1954) first advanced the notion that the sustained contraction of head muscles was responsible for the pain in tension headache. Subsequently, most of the research and conceptualization of muscle contraction headache has been based on their model. This is true even though much of their original work was based on small non-clinical samples in which extreme physical or pharmacological interventions were used to induce the onset of head pain.

Although reviews of psychophysiological investigations of tension headache reveal a great deal of inconsistencies in results obtained by various researchers, findings concerning the relation between EMG and pain are suggestive that muscle contraction is still the basis for the experience of discomfort. Current research in this area is attempting to determine if homogeneous subgroups of tension headache patients (i.e., those with abnormal EMG during headache phase vs. those patients who do not have elevated muscle activity) need to be evaluated separately. It is hoped that when these two groups are examined as discrete entities, clearer and more conclusive results should be forthcoming.

The Present Study

Recently, two investigations of possible links between the TABP and headache have been published in the scientific literature. Although both produced encouraging results, both had weak methodologies which makes interpretation and generalization difficult. Although both exploratory studies had their individual faults, they provide an impetus to the present proposal.

Hicks and Campbell (1983) published the results of a survey they administered to 177 undergraduate students. Each participant responded to the student

version of the JAS and estimated the frequency with which they experienced tension or migraine headaches on a three-point scale with the following anchors: often, sometimes, never. Using a chi-square analysis, they found a relation between Type A/B and the "frequency of headache, $p < .01$, $C^2 = .05$." Results revealed that the frequency of self-reported headache symptomatology was significantly greater in the Type A individuals than in the Bs. Although the problems with this study's methodology are blatant (i.e., both measures possess questionable reliability and validity), the results suggest the feasibility of a more comprehensive study.

The next study in this area appeared in the literature the next year. Woods, Morgan, Day, Jefferson, and Harris (1984) provided additional results with a better design. The data provided by these researchers came from two sources: (a) another survey of female undergraduates (replicated across two large independent groups) and (b) the senior author's private practice patients, most of whom were diagnosed chronic headache sufferers. The surveys from the undergraduate samples ($n = 237$ and 206) revealed identical results; increasing frequencies of headache complaints (both vascular and tension symptoms) were significantly associated with higher scores on the Type

A scale of the JAS and eta squared approximated .03. The data from the client population demonstrated a similar trend. Nearly 75% of the headache patients were classified as Type A (that is, they scored above the 50th percentile on the JAS Type A scale). Woods et al. (1984) concluded that the results of their investigation strongly suggested that the results be replicated on headache populations and extended to other non-CHD, vascular-related populations as well (e.g., Raynaud's disease).

These results clearly revealed, albeit on a very small scale (clinical sample, $n = 16$), that a behavior pattern which has been only associated with coronary artery disease now can be considered to have implications for other cardiovascular problems as well. The implications are that the TABP, originally postulated to be a "centrally-located" construct can also affect the periphery of the human vascular system. It is interesting to note that what was originally termed the "coronary-prone" behavior pattern, that is Type A, may very soon be considered the "vascular-prone" behavior pattern. In fact, Adler, et al. (1971) reported a "pressured behavioral pattern" very much like what is now termed Type A, contributing to cerebrovascular disease.

Therefore it is the main purpose of the present study to explore the relations between the TABP and other important psychometric measures of chronic headache sufferers. The investigation will first focus primarily on the incidence of the pattern in the entire sample of chronic headache individuals as well as within each diagnostic category. Secondly, the investigation will attempt to describe the association between traditional headache pain parameters (eg., intensity, frequency) and JAS groups.

The proposed study will also investigate the psychological correlates of the TABP within this population. This comprehensive description of the pattern will sample correlates from three separate domains: psychopathology, social functioning, and health beliefs and behaviors. The need to rigorously investigate psychopathological aspects of the TABP has been previously addressed. As well, the probable differences between Type A and B individuals related to interpretations of stress levels and health behaviors has been documented. The most active area of empirical research within the Type A realm currently involves the assessment of social skill development of Type A and B individual. Therefore, measures of assertion and social functioning have been included.

Experimental Hypotheses

Based on the research literature summarized in this proposal, the following primary hypotheses are presented:

(a) A significantly larger proportion of Type As will be found within the migraine (vascular headache) sample compared to the muscle contraction headache sufferers; this is primarily based on the view that the coronary-prone behavior pattern needs to be expanded to encompass other vascular disorders, most particularly migraine headaches. Previously, retrospective studies documented earlier suggest this notion.

(b) Headache frequency in individuals will be positively correlated with JAS measures; retrospective studies noted earlier have suggested this relation.

(c) Headache intensity ratings will be related to JAS scores; Type A individuals will report less intense headaches than Type Bs; this prediction is based on the studies that demonstrate that Type A individuals tend to underestimate and under-report physical symptoms in the laboratory and more naturalistic settings.

The following secondary hypotheses are also suggested:

(d) The TABP will be relatively unrelated to valid measures of psychopathology in a headache population; superior studies in the field document that the

relations between measures of the TABP and psychopathology are weak. This will be the first study to examine this relationship within a clinical population.

(e) The TABP will be related to valid measures of social functioning in a headache population; research implies that level of social skill and interpersonal functioning may be important components in the development and maintainance of Type A behavior.

(f) The TABP will be related to instruments that measure health beliefs and behaviors in a headache population; relevant research literature implies that illness behaviors and health belief differences exist between As and Bs, however no investigation has directly investigated this relation.

(g) Type As in a headache population will report significantly less stress than Bs on the daily measures of stress while identifying equivalent numbers of daily encountered stressful events.

TABP and Headache

Method

Subjects

Research subjects were recruited through newspaper advertisements and referrals from the medical community. A sample of 30 tension headache sufferers and 30 migraineurs comprised the headache population for the study.

Analyses of participants' demographic information revealed two significant differences between migraine and muscle contraction volunteers. There was a significantly larger number of men than women in the muscle contraction group, $X^2(1) = 5.96, p < .02$. As well, there were significantly more blacks in the migraine sample, $X^2(1) = 5.19, p < .02$. Table 1 describes race and sex distributions for the groups. There were no significant differences between the groups on any other demographic variable. See Table 2 for age distribution by group and Table 3 for other demographic information. Characteristics of the sample in this investigation was representative of typical headache samples used in past research efforts.

The following criteria were used in reaching headache diagnostic decisions (Ad Hoc, 1962): tension headache sufferers were characterized by the presence of typical muscle contraction pain complaints such as aching, dull pain, tightness, tension and band-like or

Table 1

Distribution of race and sex among JAS and HA groups (n = 60).

Group*	Race		Sex	
	White	Black	Male	Female
MG-Type A	13	3	1	15
MG-Type X	6	3	1	8
MG-Type B	4	1	1	4
MC-Type A	7	0	3	4
MC-Type X	13	0	2	11
MC-Type B	9	1	6	4

*MG = migraine, MC = muscle contraction

Table 2

Mean and standard deviation for age by group.

Group [*]	<u>n</u>	<u>M(SD)</u>
MG-Type A	16	36.18(9.3)
MG-Type X	9	35.44(6.1)
MG-Type B	5	41.40(4.0)
MC-Type A	7	43.71(10.7)
MC-Type X	13	39.46(5.5)
MC-Type B	10	40.09(14.0)

* MG = migraine, MC = muscle contraction

Table 3

Additional demographic information (n = 60).

Marital Status

Single	18%
Married	61%
Divorced	20%

Educational Background

No High School Diploma	5%
High School Graduate	25%
Some College	29%
College Graduate	41%

Annual Income

Less than \$10,000	2%
\$10,000 - 29,000	32%
\$30,000 - 49,000	47%
Over \$50,000	19%

Employment Status

Part-time	16%
Full-time	63%
Homemaker	14%
Unemployed/Retired	7%

cap-like pressure. Further, the presence of no more than one of the following vascular headache symptoms were reported: nausea and/or vomiting, unilateral pain, throbbing pain, visual prodromes and relief of pain from vasoconstrictive drugs. In addition, subjects included in this investigation all reported experiencing at least two headaches per week for at least one year.

Headache sufferers meeting three of the following diagnostic criteria will be included within the migraine category: unilateral pain described as throbbing or pulsating, vomiting and nausea, relief from vasoconstrictive medication, and history of diagnosed migraine headache in a first-order family member. Individuals meeting the above criteria and reported suffering at least two headaches per month for at least one year participated in the study. Those individuals who met the criteria for both groups (combination or mixed headache sufferers), that is, suffer from two distinct types of headaches, were not included in this preliminary investigation.

In addition to the inclusion criteria described above, a number of conditions excluded individuals from participation. These included: sinus headaches (with a confirmed diagnosis) indistinguishable from other headaches, temporomandibular joint syndrome (based on a

confirmed dentist's diagnosis), structural damage or physical trauma (such as concussions or pinched nerves) and past or present major psychiatric illness (eg., psychosis). Additionally, subjects who did not have a neurological screening including at least a CT scan, skull X-Ray, or electroencephalogram (EEG) were excluded from the present study.

Assignment to headache category was based on two independent diagnoses. A board-certified neurologist diagnosed all subjects based on an interview and neurological examination. Also, a doctoral student in medical/clinical psychology diagnosed the subjects using the criteria described above. Discrepancies between the decisions of the two individuals were discussed and resolved before including a person in the study. If an agreement could not be reached regarding a subject's diagnosis, that individual was excluded from the study.

Each individuals assignment to JAS group membership was based on the participants JAS score (scale A). Those participants scoring at the 25th percentile or lower according to national group norms were considered Bs. Individuals scoring at the 75th %ile or higher were considered As. Those individuals scoring between these two cutoffs were considered Xs.

Materials

One time measures. Subjects will be given the following psychometric instruments during their first session:

Jenkins Activity Survey. The Jenkins Activity Survey-Form C (Jenkins, Zyzanski, & Rosenman, 1979) will be used to categorize the participants on the Type A/B parameter. As noted in an earlier part of the proposal, the JAS is the most popular and widely accepted paper and pencil measure of the TABP. Further, it has been argued that the JAS may be the only instrument which approaches the SI's ability to correlate significantly with CHD. Finally, another major advantage of the JAS is that it provides not only a global Type A measure but three factor analytically-derived subscales: hard-driving & competitive, job-involvement, and speed & impatience. The Speed and Impatience Factor (Factor S) deals with the time urgency revealed in the style of behavior of the Type A individual. Those scoring high on this factor eat very rapidly, become impatient with the conversation of others, hurry along other people, have strong tempers, and become irritated easily. The Job Involvement Factor (Factor J) expresses the degree of dedication to occupational activity. Typically, persons scoring high on this factor report having a

challenging, high-pressure job. They work overtime and confront important deadlines. They prefer promotion to a pay raise, but usually received both in the last few years. The Hard Driving and Competitive Scale (Factor H) involves perceptions of oneself as being hard-driving, conscientious, responsible, serious, competitive, and putting forth more effort than other people. A description of all JAS items and their factor loadings, along with the procedures used to construct factor scores, is given by Zyzanski and Jenkins (1970).

IBI. The Illness Behavior Inventory (Turkat & Pettegrew, 1985) was developed and validated as a 20-item self-report measure of illness behavior. Published results indicated that the IBI possesses acceptable levels of internal consistency (Cronbach's $\alpha = .89$), test-retest reliability ($r = .90$), as well as discriminant, concurrent and predictive validity. The instrument was developed as a dependent measure with various medical patients who exhibit excessive or inappropriate illness behavior. Each item on the scale is answered on a 6-point Likert-type scale from "very descriptive of me" to "not at all descriptive of me." This particular scale adopts the definition that illness behavior is "an overt behavior

performed by an individual which indicates that he or she is physically ill or in physical discomfort."

IBQ. The Illness Behavior Questionnaire (2nd Edition) was developed by Pilowsky and Spence (1983) as a self-report measure to record aspects of illness behavior, "particularly those attitudes that suggest inappropriate or maladaptive modes of responding to one's state of health" (p. 1). The 62-item questionnaire yielded four factor analytically derived measures: hypochondriasis, disease conviction, psychological vs. somatic concern, and irritability. Empirical studies demonstrate this instrument contains adequate reliability; test-retest reliabilities are .76, .76, .84, and .85 for the aforementioned scales, respectively. Additional psychometric information and normative data for various medical and control groups are available from in the manual (Pilowsky & Spence, 1983).

HLC. Wallston, Wallston, Kaplan, and Maides (1976) reported on the development and validation of the Health Locus of Control Scale. The HLC is a specific measure of expectancies regarding locus of control developed for prediction of health-related behaviors. Higher scores are indicative of individuals who perceive themselves as an active and involved determinant of their own health. This 11-item

instrument is scored in a 6-point, Likert-type format from "strongly agree" to "strongly disagree." Reported test-retest reliability is .72.

MMPI. The Minnesota Multiphasic Personality Inventory (Hathaway & McKinley, 1943) is the most extensively used, researched, and accepted measure of psychopathology (Butcher & Tellegen, 1978). As a self-report inventory that includes several measures of psychopathology, the MMPI has become the most widely used descriptive instrument and criterion measure in clinical psychology. The 544 true-false items yield several interrelated scale scores. Dahlstrom, Welsh, and Dahlstrom (1975) present a comprehensive review of the psychometric properties of this instrument.

STAI. The State Trait Anxiety Inventory-Trait (Spielberger, Gorsuch, & Lushene, 1970) was designed to be a self-administered measure of trait anxiety. The scale is one of the most widely used measures of the psychological construct, anxiety. Validity and reliability studies as well as normative data for many varied populations are available in the manual (Spielberger, Gorsuch, & Lushene, 1970). The inventory consists of 20 items rated on a four-point scale ranging from "not at all" to "very much so."

Zung. The Zung Self-Rating Depression Scale was developed to be a short, comprehensive, and reliable

instrument that measures the severity of depression (Zung, 1965). It contains 20 items that were generated to tap features of depression that had been identified in previous factor analytic studies of depression (Friedman, Cowitz, Cohen, & Granick, 1963). Each item is rated on a four-point scale with anchors ranging from "a little of the time" to "most of the time;" a depressive index is generated by summing the item scores. Reliability and validity studies reveal this instrument to be a fairly useful measure of depression that taps cognitive, behavioral, and emotional spheres of the syndrome.

SAD/FNE. The Social Avoidance and Distress scale and the Fear of Negative Evaluation scale were developed by Watson and Friend (1969). Both scales were developed to measure different aspects of social anxiety. The SAD was developed to measure the experience of distress, discomfort, fear, and anxiety in social situations. The FNE measures a construct defined as fear of receiving negative evaluations from others; The instruments consist of 28 and 30 descriptive statements, respectively, and subjects are asked to decide if each item describes themselves. The scales have very high indexes of homogeneity ($KR-20 = .94$ for both scales) and possess sufficient reliabilities:

test-retest reliability was .94 and .79 for the FNE and SAD, respectively.

Assertion Inventory. Gambrill and Richey (1975) developed this 40-item self-report instrument to measure the construct of assertiveness. Two relatively independent scores are derived: a probability measure rating how likely the subject is to engage in the behavior (test-retest reliability = .81), and a discomfort measure, indicating the amount of discomfort he/she would experience if behaving in that way (test-retest reliability = .87). Each item is rated on a five-point scale from "none" to "very much." In a recent critical literature review of "assertion inventories," Furnham and Henderson (1984) concluded that the uniqueness of this instrument, that is, it does not yield one global assertion index, in conjunction with its psychometrically-sound characteristics, it produces a superior assertion measure.

Daily measures. Subjects were required to fill out a daily headache record which monitored headache frequency, intensity, as well as degree of incapacitation and medication intake. In addition, participants completed the following two measures on a daily basis throughout the study:

DSI. The Daily Stress Inventory (Brantley, Waggoner, Jones, & Rappaport, in press) is a 58-item self-report measure for the daily assessment of sources and individualized impact of relatively minor stressful events. It was designed to assess sources of stress not typically assessed by major life event scales. Studies demonstrate that the scale possesses adequate reliability and validity coefficients (Brantley et al., in press). Administration of the scale produces three scores: the number of daily stress events (FREQ), the perceived total magnitude of the stressors (SUM), and the average stress index (AIR).

Procedure

The present study involved eight weeks of self-monitoring by all subjects. During this period of time, subjects met in small groups bi-weekly with the investigator.

First session. During the first visit, subjects completed an informed consent form. Subjects were also administered all of the instruments listed under "one time measures." They were then supplied with the necessary forms for and instructed in the use of the daily monitoring procedures.

Second session. During the second visit, research participants returned with their home records for the first two weeks. Any errors or misunderstandings in

the self-monitoring procedure were clarified and/or corrected. Home records were collected from subjects and new headache records and daily self-monitoring materials (i.e., DSI) were distributed for the following period.

Third, Fourth, and Fifth sessions. These meetings were similar in nature to the second session in that self-monitoring data were collected, questions and problems were addressed, and new forms were distributed. During the last session, at the end of the eighth week of monitoring, arrangements were made for participants to receive individual headache treatment.

TABP and Headache

Results

Independent Variable

The Jenkins Activity Survey (JAS) Type A Scale was used to divide the sample into Types A, X, and B classifications. As noted earlier, those individuals scoring at the 25th percentile (according to national norms) or lower were considered Type B. Participants whose JAS-A scale score was at the 75th percentile or higher was considered Type A. Those individuals whose score lies between the 25th and 75th percentiles were classified as Type X (i.e., individuals who have some Type A and Type B characteristics).

Incidence of TABP in Headache Population

The main purpose of this study was to investigate the incidence of the TABP in a chronic headache population. It was hypothesized that a significantly larger proportion of migraineurs would be classified as Type A as compared to muscle contraction headache sufferers. A 2 X 3 (Headache diagnostic group by JAS group) chi-square analysis revealed a significant difference in the distributions, $\chi^2 (2) = 5.92$, $p < .05$; see Table 4). Significantly more Type A individuals were found in the migraine diagnostic group as compared with the muscle contraction headache group. Three 2 X 2 follow-up chi square analyses were performed to ascertain where the significant

Table 4

Frequency of sample by JAS X HA.

JAS	HA		
	MG	MC	
A	16	7	23
X	9	13	22
B	5	10	15
	30	30	

differences were within the significant 2 X 3 analysis. See Tables 5, 6, and 7 for these analyses. Significant differences were found between As and Bs as well as As and Xs. Non-significant results were obtained for the chi square analysis between Bs and Xs.

Headache Data

Data Reduction

Mean measures of headache intensity (HAI; 1-10 rating scale; see appendix for rating form) were computed for each subject. These data were obtained from daily headache self-monitoring forms. Mean measures were obtained by averaging each headache intensity rating for the entire two month monitoring period. The average number of headache days per month for the eight week period (HAF) was also be recorded for each subject (0-28).

Data Analyses

The two head pain parameters (HAI & HAF) were analyzed by a 2 X 3 (Type of Headache by JAS Group) completely randomized MANOVA. Results indicated significant differences for JAS group, multivariate $F(4, 108) = 2.76, p < .03$ and headache diagnosis, multivariate $F(2, 53) = 7.03, p < .002$. The interaction of these main effect was not significant, multivariate $F(4, 108) = .62, p < .66$. A follow-up two-way ANOVA for HAI revealed significant differences

Table 5

Frequency of sample by JAS/HA designation

JAS	<u>Headache</u>	
	MG	MC
A	16	7
B	5	10
	21	17
		38

 $\chi^2 (1) = 4.82, p < .03$

Table 6

Frequency of sample by JAS/HA designation.

JAS	<u>Headache</u>	
	MG	MC
A	16	7 23
X	9	13 22
	25	20 45

$$X^2 (1) = 3.74, p = .05$$

Table 7

Frequency of sample by JAS/HA designation.

	Headache		
	MG	MC	
JAS			
X	9	13	22
B	5	10	15
	14	23	37

 $\chi^2 (1) = .22, p < .63$

for JAS group, $F(2, 54) = 3.76, p < .03$ (Table 8). A follow-up two-way ANOVA for HAF indicated significant differences for headache group, $F(1, 54) = 14.27, p < .0007$ (Table 9). No other main effects or interactions were significant. Post-hoc analysis for HAI means revealed that Bs ($M = 3.1$) reported significantly less intense headaches than did Xs ($M = 4.1$) and As ($M = 3.9$). For HAF, MCs ($M = 20.9$) reported significantly more headaches than MGs ($M = 12.4$).

Psychologic Data

One-time measures

Subjects' data for all one-time dependent measures (i.e., IBI, SAD, MMPI, IBQ, FNE, HLC, STAI, Zung, Assertion Inventory) were analyzed in 2 X 3 (Type of Headache by JAS Group) completely randomized MANOVAs within domains (i.e., social functioning, psychopathology, health beliefs and behaviors) when possible.

Psychopathology. A 2 X 3 MANOVA for the standard MMPI validity (i.e., L, F, & K) and clinical (1, 2, 3, 4, 6, 7, 8, 9, & 0) scales revealed no significant main effects or interaction (Table 10). A 2 X 3 MANOVA using the Zung and STAI scores as dependent measures also showed no significant effects (Table 11).

Social functioning. The instruments within this domain were the Social Avoidance and Distress Scale

Table 8

Anova summary table for headache intensity rating (n = 60).

Source	SS	df	MS	F	p	η^2
JAS	835.44	2	417.72	3.76	.03	.12
HA	74.91	1	74.91	.68	.42	
JAS X HA	195.21	2	97.61	.88	.42	
Error	5992.27	54	110.99			

Table 9

Anova summary table for headache frequency (n = 60).

Source	SS	df	MS	F	p	η^2
JAS	295.05	2	129.52	1.97	.14	
HA	936.75	1	936.75	14.27	.0007	.18
JAS X HA	72.72	2	36.36	.55	.58	
Error	3544.98	54	65.65			

Table 10

Manova results for MMPI scales (n = 54).

Source of Variance	F	df	p
JAS	1.22	26,74	.25
HA	.92	13,36	.55
JAS X HA	.55	26,72	.92

Table 11

Manova results from STAI and Zung scales (n = 60).

Source of Variance	F	df	p
JAS	.73	4,108	.57
HA	.73	2,53	.49
JAS X HA	.87	4,108	.48

(SAD) and the Fear of Negative Evaluation Scale FNE). A 2 X 3 MANOVA using subjects' SAD and FNE scores as dependent measures yielded a significant JAS by HA diagnosis interaction, multivariate $F(4, 101) = 3.41$, $p < .01$ (Table 12). A 2 X 3 ANOVA for the FNE revealed no significant interaction effects (Table 13). However, a 2 X 3 ANOVA for the SAD revealed a significant interaction, $F(2, 51) = 4.84$, $p < .01$. (See Table 14). Figure 1 contains group means for SAD data. A post-hoc simple effects test revealed that the mean for the MC-Bs was significantly higher than the MG-B mean, $p < .05$. No other group means were significantly different from each other.

A 2 X 3 MANOVA for the two subscores of the Assertion Inventory (i.e., Degree of Discomfort & Response Probability) revealed no significant differences. (See Table 15).

Health Beliefs and Behaviors. A 2 X 3 MANOVA for four scales of the Illness Behavior Questionnaire (Scales 2, 3, 7, & Whiteley Hypochondriasis) revealed a significant effect for JAS group, multivariate $F(8, 92) = 2.08$, $p < .05$ (Table 16). There were no other significant effects. Tables 17, 18, 19, and 20 present ANOVA summary tables for IBQ Scales 2, 3, 7, & Whiteley Hypochondriasis, respectively. These analyses revealed only two significant differences, both main effects for

Table 12

Manova results for SAD/FNE scales (n = 57).

Source of Variance	F	df	p
JAS	.17	4,101	.95
HA	.37	2,50	.70
JAS X HA	3.41	4,101	.01

Table 13 .

Anova summary table for FNE scale (n = 57).

Source	SS	df	MS	F	p	η^2
JAS	34.17	2	17.09	.27	.77	
HA	33.50	1	33.50	.53	.48	
JAS X HA	321.23	2	160.62	2.51	.09	
Error	3201.20	51	64.02			

Table 14

Anova summary table for SAD scale (n = 57).

Source	SS	df	MS	F	p	η^2
JAS	18.55	2	9.27	.18	.83	
HA	3.15	1	3.15	.06	.79	
JAS X HA	419.53	2	245.76	4.84	.01	.16
Error	2540.66	51	50.81			

Figure 1.

Table 15

Manova results for Assertion Inventory scales (n = 46).

Source of Variance	F	df	p
JAS	.74	4,80	.57
HA	.51	2,39	.61
JAS X HA	1.54	4,80	.19

Table 16

Manova results for IBQ scales (n = 54).

Source of Variance	F	df	p
JAS	2.08	8,92	.05
HA	.84	4,45	.51
JAS X HA	1.93	8,92	.07

Table 17

Anova summary table for IBQ scale 2 (Disease Conviction; n = 54).

Source	SS	df	MS	F	p	η^2
JAS	9.18	2	4.59	2.32	.11	
HA	2.96	1	2.96	1.50	.22	
JAS X HA	.52	2	.26	.13	.87	
Error	95.11	48	1.98			

Table 18

Anova summary table for IBQ scale 3 (Psycho vs Somatic; n = 54).

Source	SS	df	MS	F	p	η^2
JAS	4.94	2	2.48	3.40	.04	.12
HA	.01	1	.01	.01	.87	
JAS X HA	2.17	2	1.09	1.50	.23	
Error	34.86	48	.73			

Table 19

Anova summary table for IBQ scale 4 (Irritability; n = 54).

Source	SS	df	MS	F	p	η^2
JAS	1.37	2	.68	.60	.56	
HA	1.37	1	1.37	1.20	.28	
JAS X HA	.76	2	.38	.34	.72	
Error	54.36	48	1.13			

Table 20

Summary table for IBQ Whiteley Hypochondriasis Scale (n = 54).

Source	SS	df	MS	F	p	η^2
JAS	44.77	2	22.38	3.01	.05	.11
HA	.65	1	.65	.09	.76	
JAS X HA	34.47	2	17.23	2.32	.11	
Error	356.60	48	7.43			

JAS group. Significant results were obtained for Scale 3, $F(2, 48) = 3.40, p < .04$ and Whiteley Hypochondriasis Scale, $F(2, 48) = 3.01, p < .05$. For Scale 3, group means were 1.60, 1.12, and .75 for As, Xs, and Bs, respectively. A Tukey's test revealed a significant difference between Type As and Bs. No other group mean differences were obtained. For the Whiteley Hypochondriasis Scale, group means were 2.58, 4.73, and 4.13 for Type A, X, and B, respectively. A Tukey's test revealed a significant difference between Type As and the other two groups. No other significant differences were obtained.

A 2 X 3 ANOVA for the Health Locus of Control revealed no significant differences. (See Table 21).

A 2 X 3 ANOVA for the Illness Behavior Inventory revealed a significant main effect for headache diagnosis, $F(1, 53) = 7.17, p < .009$. Group means were 70.14 and 58.44 for MGs and MCs, respectively. A significant effect was also obtained for JAS group, $F(2, 53) = 4.41, p < .02$ (Table 22). Group means were 55.47, 66.14, and 72.50 for As, Xs, and Bs, respectively. A Tukey's test for JAS means revealed a significant difference between As and Bs only, $p < .05$.

Daily measures

Data Reduction. Daily Stress Inventory scores (FREQ, SUM, & AIR) were computed for each participant

Table 21

Anova summary table for HLC (n = 56).

Source	SS	df	MS	F	p	η^2
JAS	46.64	2	23.32	.42	.67	
HA	4.05	1	4.05	.07	.78	
JAS X HA	228.15	2	114.08	2.05	.14	
Error	2780.92	50	55.62			

Table 22

Anova summary table for IBI (n = 59).

Source	SS	df	MS	F	p	η^2
JAS	2468.15	2	1234.07	4.41	.02	.13
HA	1996.18	.1	1996.18	7.17	.009	.14
JAS X HA	312.85	2	156.42	.56	.58	
Error	14761.63	53	278.52			

for the first 28 days of the monitoring period. The frequency of item endorsement (FREQ), the total of these endorsements (SUM) and the SUM divided by the FREQ (average intensity rating: AIR) were each averaged for all subjects, yielding three dependent measures per subject.

Data Analysis. Obtained DSI means were subjected to a 2 X 3 MANOVA. Results revealed no significant differences (Table 23).

All group means for all dependent measures can be found in the appendices.

Table 23

Anova results for DSI scales (FREQ, SUM, AIR; n = 49).

Source of Variance	F	df	p
JAS	1.19	6,84	.32
HA	2.56	3,41	.07
JAS X HA	1.35	6,82	.23

TABP and Headache

Discussion

The primary purpose of this investigation was to examine the distribution of Type A and B individuals within a chronic headache population. Specifically, it was hypothesized that there would be a significantly larger proportion of Type As within the migraine diagnostic group as compared with a sample of muscle contraction headache sufferers. For many years, practitioners treating headache sufferers made note of the "migraine personality." This clinical lore developed in the absence of any empirical demonstration of the phenomenon. Indeed, a review of the literature examining the personality characteristics of migraineurs provided equivocal results.

After close examination of the descriptions provided by practitioners, it was hypothesized that what was being noted was not "personality" or characteristics of psychopathology, per se, but instead, the high incidence of Type As within this population of vascular headache individuals. Although two previous studies had provided some evidence of a significant relation between headache occurrence and the TABP within a general population (Hicks & Campbell, 1983; Woods et al., 1984), no prospective study to date had documented this relation.

Results from the chi-square analysis in this investigation clearly support the primary hypothesis: a significantly larger proportion of MGs were classified as Type A by the JAS. Indeed, over 53% of the MGs scored between the 75th and 99th percentile on the JAS Type A scale, a conservative measure of TABP. This high incidence rate is clearly a phenomenon found only in the vascular headache sample. In the MC sample, less than 25% of headache sufferers scored in this upper quartile.

Examination of the lower quartiles of the headache population illustrate a differential distribution as well. Whereas a third of the MCs were classified as Type B (i.e., 33.33% of MCs scored at the 25th percentile or lower), only 16.66% of MGs scored in this lowest quartile.

It is important to note that the importance of this finding now allows the broadening of the concept of TABP. As originally formulated by cardiologists Rosenman and Friedman, individuals possessing characteristics of Type A were at risk to develop cardiovascular disease. Subsequent to their original conception, nearly all of the research has focused on a single population. That is, all large investigations of the TABP have revolved around those individuals at risk of developing coronary artery disease. With this

demonstration, (i.e., Type A individuals are at risk to develop other vascularly-related disorders), the boundaries of TABP research are widened.

The secondary foci of this investigation were to:

(a) explore the relation between JAS scores and traditional headache pain parameters and (b) provide a comprehensive psychologic description of the characteristics of Type As and Bs within a chronic headache population (i.e., how they might differ on measures of social functioning, headache beliefs and behaviors, and psychopathology).

Turning first to the headache pain data, significant differences were found for both headache intensity ratings and headache frequency. For HAF, significantly more headaches were suffered by tension headache individuals than migraineurs. This finding is not surprising due to the nature of the two types of headache as well as the criteria for entry into the study. In fact, the headache data from this study might become suspect had these significant differences not been obtained.

More interesting were the results of the HAI analysis: Type Bs reported significantly less intense headpain as compared to As and Xs. This result was in the opposite direction from the original hypothesis. The hypothesis that As would report less intense head

pain than Bs grew out of the laboratory findings that Type As tend to suppress the reporting of physical complaints and symptoms. This first attempt to generalize these findings outside of the laboratory has failed. These initial results need to be replicated in future studies.

Also of note is the result that significantly different intensity ratings were not obtained between muscle contraction headache subjects and migraineurs. It is usually assumed that migraine headache attacks, due to their vascular nature and associated symptoms, are the more painful. This lack of findings invites further empirical investigation.

Several hypotheses were suggested as secondary goals of this investigation. Each was concerned with providing a description of Types A and B headache sufferers within a particular domain of psychological functioning.

A controversy within the Type A literature involves the relation between measures of the TABP and psychopathology. Irvine and associates published results which demonstrated a strong correlation between the two constructs (Irvine et al., 1982), concluding that Type A was psychopathology. Although some researchers (Irvine et al., 1982) have attempted to demonstrate that the TABP is a constellation of

traditional constructs of psychopathology, others (Chesney et al., 1981; Wadden et al., 1983) have demonstrated that the TABP does not strongly correlate with measures of psychologic disturbance in various populations. To date, no investigation was conducted within a chronic headache population.

Consistent results were obtained within this study for all measures of psychopathology (i.e., MMPI, STAI, and Zung). It was hypothesized that measures of psychopathology would not be related to JAS scores. This study was successful in demonstrating that within a chronic headache population, measures of Type A are not significantly related to measures of psychopathology. Results from statistical analyses of MMPI, STAI and Zung data revealed no significant differences between those headache volunteers classified as Type A, B, or X.

These findings have several important implications. First, from a treatment viewpoint, traditional intervention procedures used to modify levels of depression, anxiety, paranoia, or other psychological disturbances will have little effect on Type A behavior per se. Additionally, because of the lack of significant statistical differences between As and Bs on these measures, obtained differences between

these groups on others measures cannot be accounted for by differences in levels of psychopathology.

Turning to the social functioning data, it was hypothesized that Type A and B headache sufferers would differ on measures of assertion, social avoidance and fear of negative evaluation. Results within this domain are less consistent than above and more difficult to interpret.

Concerning the Assertion Inventory data, there were no significant differences between headache diagnostic groups nor JAS classifications. As well, the statistical analyses revealed no differences for FNE data. However, the interaction effect was significant for SAD data, with post-hoc analyses revealing that for Type Bs only, muscle contraction headache sufferers scored significantly higher than migraineurs. See Figure 1.

The SAD was developed and validated as a measure of social avoidance. Those individuals scoring high (usually above 9) on this scale tend to avoid social interactions, prefer to work alone, report that they talk less, and worry about social relationships; Type B tension headache sufferers scored above this cutoff score ($\bar{M} = 13.85$) with their migraine counterparts scoring significantly lower ($\bar{M} = 2.04$). Unfortunately, it is unclear how to interpret this finding; there is

no current existing literature which would predict this outcome. It is hoped that replication of this study will provide additional information in order to understand this result.

The lack of consistent results within the social functioning domain is disappointing. As noted earlier, this area currently seems to be the most active with several very recent investigations demonstrating differences between Type A and B college students on levels of social skill (Watkins, 1986; Watkins & Eisler, 1986). Both of these studies, using behavioral assessment of social skill, revealed clear differences between As and Bs. One explanation for the inconsistency between this investigation and others may lie in the assessment technique used. In this study, questionnaire or self-report data was the only source of information whereas the previous studies used a behavioral assessment methodology. It is possible that while social skill differences do exist between Type A and B individuals, these differences are not exhibited on questionnaires designed to measure assertion, social avoidance, and fear of negative evaluation. Future studies need to continue to investigate this area with both self-report and behavioral assessments of social skill.

One of the three questionnaires used to describe the health beliefs and behaviors of headache sufferers Typed A, B, or X, the Health Locus of Control, did not statistically differentiate between the groups. However, as hypothesized, significant differences were obtained for the other two measures, the Illness Behavior Questionnaire and the Illness Behavior Inventory.

On the IBI, statistical differences were obtained between Types A and B, with Type Bs evidencing higher scores than Type As. Normative data for the IBI report 72.5 for patients labeled as high illness behavior patients and 53.7 for low illness behavior patients. The means for As (55.47) and Bs (72.50) coincide quite closely with the normative data; therefore obtained differences are not merely statistically different but in comparison to normative data, they become quite meaningful.

These data are rather striking because they reflect substantial differences between Type A and B headache individuals along illness behavior parameters. Because the IBI was developed to identify patients with excessive or inappropriate illness behavior, and scores on this questionnaire correlate positively with medical expenditures, frequency of medical utilization, number of days in the hospital, and other similar indices

(Turkat & Pettegrew, 1983), obtained results confirm the notion that Type As possess lower rates of illness behaviors than their Type B counterparts. But as noted by Eagleston et al. (1986) there is the possibility that Type As may not actually exhibit less illness behavior but merely report this difference. In future investigations concerned with illness behavior differences between As and Bs, researchers need to obtain additional valid measures of illness behavior (eg., hospital and doctor records, medication indices).

Statistical differences were also obtained between migraine and muscle contraction headache sufferers on the Illness Behavior Inventory. Results demonstrated that migraineurs scored higher on the IBI than tension headache volunteers. Although group means were significant, they did not coincide as well with normative data as did the Type A-B differentiation. This effect, although important to document, is not surprising. The physical symptoms which commonly accompany migraine headache attacks are usually substantially incapacitating so that individuals usually exhibit those behaviors measured by the IBI (i.e., consultation with a physician, taking medication, substantial interference with daily functioning while ill).

Two of the scales from the Illness Behavior Questionnaire differentiated between Type A and B headache subjects. Statistical analyses revealed differences between Type A and B headache sufferers on the Whiteley Hypochondriasis Scale of the IBQ as well as Scale 3, Psychologic versus Somatic perception of illness. Specifically, As scored higher ($M = 1.6$) than Bs ($M = .75$) on Scale 3 with As ($M = 2.58$) scoring lower than Xs or Bs ($M_s = 4.73$ and 4.13 , respectively) on the Whiteley Hypochondriasis Scale.

The Whiteley Scale was developed to distinguish patients who exhibited high levels of hypochondriacal behavior from those individuals with normal levels. According to the scale's developers, a high score indicates "somatic preoccupation, disease affirmation, disease phobia, and indicates the increased probability of a hypochondriacal disorder" (Pilowsky & Spence, 1984, p. 125). Scale 3 of the IBQ (Psychologic vs. Somatic perception of illness) indicates the degree to which the patient perceives the illness in "psychologic" as opposed to "physiologic" terms.

These differences are consistent with the notion that Type A individuals fail to perceive physical symptoms and thus chronically overexpose themselves to stressors (Burke & Weir, 1980; Hart, 1983). In a recently published report, Eagleston and his colleagues

determined that "Type A children keep pushing themselves to perform when ill, perhaps denying the severity or meaning of their symptoms" (Eagleston, et al., 1986, p. 360).

It was hypothesized that Type A headache sufferers would report fewer stressors on the Daily Stress Inventory as compared to Type Bs. It was further suggested that Type As would rate these stressful events significantly lower than their Type B counterparts. The analyses of the DSI data revealed no significant differences between JAS groups nor headache diagnosis on any of the three scales (i.e., FREQ, SUM, & AIR).

These negative results are puzzling because the most recent studies in this area are beginning to demonstrate with increasing frequency a strong difference between Type A and B individuals in the way they report stress and tension levels both within laboratory settings and the natural environments (Matthews & Cara, 1982; Siegel, 1982; Weidner & Matthews, 1978). However, none of the studies which suggest that differences exist used a daily measure of stress but instead used more global measures (i.e., Life Events Survey). Future studies need to administer both global and daily measures of stress to ascertain if differences in reporting exist with parameters.

In a recent study, Carmody and colleagues (Carmody, Hollis, Matarazzo, Fay, & Connor, 1984) suggested that the environmental conditions under which stress data is collected might affect whether Type As suppress subsequent stress ratings. Their study concluded that Type As are most likely to suppress stress symptom reports in field or naturalistic settings when under conditions of high challenge. The stress data gathered in this study was done without any "challenge" manipulation nor was there any consequences to subjects report of either high or low levels of stress. Future studies, both within the headache population and more traditional Type A populations, need to include such conditions in order to ascertain if such differences exist.

Because the primary intention of this investigation was exploratory in nature, there are a number of limitations in attempting to generalize results of this study. Specifically, because of the lack of a control group of nonheadache individuals, the results of this investigation cannot be generalized to other populations. However, now that this investigation has provided clear evidence that a large proportion of individuals suffering from vascular headaches are indeed Type A, future studies might examine whether psychologic differences between the JAS

groups here are also encountered in more traditional Type A populations. This investigation clearly opens the door for that direction of study.

Although several psychological questionnaires were used in this study to provide a comprehensive description, the investigation by no means encompassed all constructs within psychopathology, social functioning, health beliefs and behaviors, etc. As well, this investigation used only one measure of each psychological construct. It will be important in future studies to use not only different questionnaires but different procedures to measure certain constructs (e.g., behavioral assessment of assertion, actual illness behaviors).

Additional studies are needed to replicate the findings obtained here and to further expand our knowledge of the ways in which Type As and Bs function. As mentioned earlier, actual this study failed to demonstrate significant differences between Types A and B on three measures of social functioning, the assessment of social skill levels among Type A and B individuals is an empirical question ripe for investigation (Watkins, 1986; Watkins & Eisler, 1986). As well, current investigations point to the importance of anger and hostility levels as mediators in the development of CHD in Type A individuals (Matthews &

Haynes, 1986). When this research is performed, it will be important however to include not only traditional Type A populations (i.e., those at risk for CHD) but other populations like this one, as well.

In spite of the limitations noted above, the findings obtained in this effort are encouraging. In summary, this investigation was successful in several spheres. First, this study provides a clear demonstration that the traditional conceptualization of the TABP needs to be expanded. This is based on the high incidence of Type A individuals within the vascular headache group. What was initially referred to as "coronary-prone behavior" instead needs reconceptualized as "vascular-prone behavior." In addition, this study provides clear evidence that the "migraine personality" which headache practitioners have written about for years without any empirical evidence may in fact be the same constellation of characteristics referred to as the Type A Behavior Pattern. Besides a replication of the findings of this study, future investigations need to begin to examine the biological mechanisms which link Type A behavior to migraine headache.

In addition, this investigation was successful in describing the psychological functioning of Type A and B headache sufferers across several domains. Some of

the significant results obtained in this study should provide impetus for further empirical investigation (i.e., health beliefs and behaviors, social functioning). It is also hoped that further investigation along these lines will lead toward improved treatment procedures for Type A individuals.

The non-significant results within the psychopathology domain provide further evidence in yet another population that the JAS and traditional measures of psychopathology (eg., MMPI, STAI, and Zung) are not related. This finding should help to focus Type A interventions away from traditional procedures and toward more innovative strategies.

TABP and Headache

REFERENCES

- Adams, H. E., Feuerstein, M., & Fowler, J. L. (1980).
The migraine headache: A review of parameters,
theories, and interventions. Psychological
Bulletin, 87, 217-237.
- Ad Hoc Committee on classification of headache.
(1962). Classification of headache. Journal of
the American Medical Association, 179, 717-718.
- Andrasik, F., Blanchard, E. B., Arena, J. B., Saunders,
N. L., & Barron, K. D. (1982). Psychophysiology
of recurrent headache: methodological issues and
new empirical findings. Behavior Therapy, 13,
407-429.
- Andrasik, F., Blanchard, E. B., Arena, J. G., Teders,
S. J., Teevan, R. C., and Rodichok, L. D.
(1982). Psychological functioning in headache
sufferers. Psychosomatic Medicine, 44, 171-182.
- Andrasik, F., Blanchard, E. B., Arena, J. G., Teders,
S. J., & Rodichok, L. D. (1982). A cross
validation of the Kudrow-Sutkus classification
system for diagnosing headache type. Headache,
22, 2-5.
- Appenzeller, O. (1969). Vasomotor function in
migraine. Headache, 9, 147-155.
- Appenzeller, O., Feldman, R. G., & Friedman, A. P.
(1979). Migraine headache and related conditions:
panel 7. Archives of Neurology, 36, 784-805.

- Bakal, D. A. (1975). Headache: A biopsychological perspective. Psychological Bulletin, 82, 369-382.
- Beeson, P. B., McDermott, W., & Wyngaarden, J. B. (1979). Cecil's Textbook of Medicine. Philadelphia: W.B. Saunders Company.
- Berkman, L. F. & Syme, L. (1979). Social networks, host resistance, and mortality: A 9 year follow-up study of Alameda County residents. American Journal of Epidemiology, 109, 186-204.
- Blumenthal, J. A., Williams, R. B., Kong, Y., Schanberg, S. M., & Thompson, L. (1978). Type A behavior pattern and coronary atherosclerosis. Circulation, 58, 634-639.
- Bortner, R. W. (1969). A short rating scale as a potential measure of pattern A behavior. Journal of Chronic Diseases, 22, 87-91.
- Brand, R. J. (1978). An examination of the association between A-B behavior and coronary heart disease incidence. In T.M. Dembroski, S.M. Weiss, J.L. Shields, S.G. Haynes, & M. Feinleib (Eds.), Coronary-prone behavior. New York: Springer-Verlag.
- Brand, R. J., Rosenman, R. H., Sholtz, R. I., & Friedman, M. (1976). Multivariate prediction of coronary heart disease in the Western Collaborative Group Study compared to the findings of the Framingham Study. Circulation, 53, 348-355.

- Brantley, P. J., Waggoner, C. D., Jones, G. N., & Rappaport, N. B. (in press). A daily stress inventory: development, reliability and validity. Journal of Behavioral Medicine.
- Burke, R. J. & Weir, T. (1980). Career success and personal failure: nature of the problem. Industrial Relations, 27, 7-17.
- Caffrey, B. (1968). Reliability and validity of personality and behavioral measures in a study of coronary heart disease. Journal of Chronic Diseases, 21, 191-204.
- Carmody, T., Hollis, J., Matarazzo, J., Fay., S. & Connor, W. (1984). Type A behavior, attentional style, and symptom reporting among adult men and women. Health Psychology, 3, 45-61.
- Carver, C., Coleman, A. E., & Glass, D. C. (1976). The coronary-prone behavior pattern and the suppression of fatigue on a treadmill test. Journal of Personality and Social Psychology, 33(4), 460-466.
- Carver, C. and Glass, D. (1978). Coronary-prone behavior pattern and interpersonal aggression. Journal of Personality and Social Psychology, 36, 361-366.
- Chesney, M. S., Black, G. W., Chadwick, J. H., & Rosensman, R. H. (1981). Psychological correlates of the Type A behavior pattern. Journal of Behavioral Medicine, 2, 217-219.

- Cinciripini, P. M., Williamson, D. A., and Epstein, L. H. (1980). Behavioral treatment of migraine headache. In J.M. Ferguson & C.B. Taylor (Eds.). The Comprehensive Handbook of Behavioral Medicine (Vol. 2). Jamaica, N.Y.: Spectrum Press.
- Clark, D. H., Hough, B., & Wolff, H. G. (1936). Experimental studies on headache: observations on histamine headache. Archives of Neurology and Psychiatry, 35, 1054-1069.
- Cobb, S. (1976). Social support as a moderator of life stress. Psychosomatic Medicine, 38, 300-313.
- Cohen, J. B., Syme, S. L., Jenkins, C. D., Dagan, A., & Zyzanski, S. J. (1975). The cultural context of Type A behavior and the risk of CHD. American Journal of Epidemiology, 102, 434.
- Cohen, M. J., & McArthur, D. L. (1981). Classification of migraine and tension headache from a survey of 10,000 headache diaries. Headache, 21, 25-29.
- Cuypers, J., Altenkirch, H., and Bunge, S. (1981). Personality profiles in cluster headaches and migraine. Headache, 21, 21-24.
- Dalessio, D. J. (1972). Wolff's Headache and other Head Pain. (3rd Ed.). London: Oxford University Press.

- Dembroski, T. M., MacDougall, J. M., Herd, J. A., and Shields, J. M. (1978). Effect of level of challenge on pressor and heart rate responses in Type A and B subjects. Journal of Applied Social Psychology, 9, 209-228.
- Dembroski, T. M., MacDougall, J. M., Shields, J. L., Pettito, J., and Lushene, R. (1978). Components of the Type A coronary-prone behavior pattern and cardiovascular responses to psychomotor performance challenge. Journal of Behavioral Medicine, 1, 159-176.
- Dembroski, T. M., MacDougall, J. M., Williams, R. B., Haney, T. L., & Blumenthal, J. A. (1985). Components of Type A, hostility, and anger-in: Relationship to angiographic findings. Psychosomatic Medicine, 47, 219-223.
- Diamond, S. and Dalessio, D. J. (1978). The Practicing Physician's Approach to Headache (2nd Edition). Baltimore: Williams & Willkins.
- Ducimetiere, P., Cambien, F., Richard, J. L., Rakotovao, T., & Claude, J. R. (1980). Coronary heart disease in middle-aged Frenchmen. Lancet, 1, 1346-1349.
- Dukes, H. T. & Vieth, R. G. (1964). Cerebral arteriography during migraine prodrome and headache. Neurology, 14, 636.

- Eagleston, J. R., Kirmil-Gray, K., Thoresen, C. E.,
Wiedenfeld, S. A., Bracke, P., Heft, L. & Arnow,
B. (1986). Physical health correlates of Type A
Behavior in children and adolescents. Journal of
Behavioral Medicine, 9, 341-362.
- Eastwood, M. R., and Trevelyan, H. (1971). Stress and
coronary heart disease. Journal of Psychosomatic
Research, 15, 289-292.
- Eysenck, H. J., & Fulker, D. (1983). The components
of Type A behaviour and its genetic determinants.
Personality and Individual Differences, 4,
499-505.
- Feinleib, M., Brand, R. J., Remington, R., & Zyzanski,
S. J. (1978). Section summary: Association of
the coronary-prone behavior pattern and coronary
heart disease. In T.M. Dembroski, S.M. Weiss,
J.L. Shields, S.G. Haynes, & M. Feinleib (Eds.),
Coronary-prone behavior. New York:
Springer-Verlag, 2-9.
- Friedman, A. P. (1978). Migraine. Medical Clinics of
North America, 62, 481-494.
- Friedman, A. P. (1979). Characteristics of tension
headache: a profile of 1420 cases.
Psychosomatics, 20, 451-461.
- Friedman, M. (1969). Pathogenesis of Coronary Artery
Disease. McGraw-Hill: New York.
- Friedman, M., Byers, S. O., Diamant, J., & Rosenman, R.
H. (1975). Plasma catecholamine response of

coronary-prone subjects (Type A) to a specific challenge. Metabolism, 24(2), 205-210.

Friedman, M., Byers, S. O., Rosenman, R. H., & Elevitch, F. R. (1970). Coronary-prone individuals (Type A behavior pattern): Some biochemical characteristics. Journal of the American Medical Association, 21, 1030-1037.

Friedman, M., & Rosenman, R. H. (1959). Association of specific overt behavior pattern with blood and cardiovascular findings. Journal of the American Medical Association, 169, 1286-1296.

Friedman, M. & Rosenman, R. H. (1974). Type A Behavior and your Heart. New York: Knopf.

Friedman, M., St. George, S., Byers, S. O. (1960). Excretion of catecholamines, 17-ketosteroids, 17-hydroxy-corticoids and 5-hydroxyindole in men exhibiting a particular behavior pattern (A) associated with high incidence of clinical coronary artery disease. Journal of Clinical Investigations, 39, 758-764.

Friedman, M., Straus, R., Wurm, M., & Kositchek, R. (1968). The relationship of behavior pattern A to the state of the coronary vasculature: a study of 51 autopsied subjects. American Journal of Medicine, 44, 525-538.

- Gambrill, E. D. & Richey, C. A. (1975). An assertion inventory for use in assessment and research. Behavior Therapy, 6, 550-561.
- Gilbert, D. G., & Reynolds, J. H. (1984). Type A Personality: Correlations with personality variables and nonverbal emotional expressions during interpersonal competition. Personality and Individual Differences, 5, 27-34.
- Glass, D. C. (1977). Stress behavior patterns and coronary disease. American Scientist, 65, 177-187.
- Glass, D. C. (1977). Behavior Pattern, Stress, and Coronary Disease. Hillsdale, N.J.: Erlbaum.
- Gordon, T., Garcia-Palmieri, M. R., Kagan, A., Kannel, W. B., & Schiffman, J. (1974). Differences in coronary heart disease in Framingham, Honolulu, and Puerto Rico. Journal of Chronic Diseases, 27, 329-337.
- Graham, J. R. & Wolff, H. G. (1938). The mechanism of migraine headache and the action of ergotamine tartrate. Archives of Neurology and Psychiatry, 39, 737-763.
- Harrison, R. (1975). Psychological testing in headache: a review. Headache, 15, 453-463.
- Hart, K. E. (1983). Physical symptom reporting and health perception among Type A and B college males. Journal of Human Stress, 9, 17-22.

- Haynes, S. B., Feinleib, M., Levine, S., Scotch, N., & Kannel, W. B. (1978). The relationship of psychosocial factors to coronary heart disease in the Framingham Study: prevalence of coronary heart disease. American Journal of Epidemiology, 107, 384-402.
- Haynes, S. G., Feinleib, M., & Kannel, W. B. (1980). The relationship of psychosocial factors to coronary heart disease in the Framingham Study. III. Eight-year incidence of coronary heart disease. American Journal of Epidemiology, 111, 37-58.
- Henryk-Gutt, R. and Rees, W. L. (1973). Psychological aspects of migraine. Journal of Psychosomatic Research, 17, 141-153.
- Hicks, R. A. & Campbell, J. (1983). Type A-B behavior and self-estimates of the frequency of headaches in college students. Psychological Reports, 52, 912.
- Irvine, J., Lyle, R., and Allon, R. (1982). Type A personality as psychopathology. Journal of Psychosomatic Research, 26, 183-189.
- Jenkins, C. D. (1971). Psychologic and social precursors of coronary disease. New York Journal of Medicine, 284, 244-255, 307-317.
- Jenkins, C. D. (1976). Recent evidence supporting psychologic and social risk factors for coronary

- disease. New England Journal of Medicine, 294, 987-994, 1033-1038.
- Jenkins, C. D., Rosenman, R. H., & Friedman, M. (1965). Replicability of rating the coronary-prone behavior pattern. British Journal of Preventive and Social Medicine, 27, 424-434.
- Jenkins, C. D., Rosenman, R. H., & Zyzanski, S. J. (1974). Prediction of clinical coronary heart disease by a test for the coronary-prone behavioral pattern. New England Journal of Medicine, 290, 1271-1275.
- Jenkins, C. D., Zyzanski, S. J., & Rosenman, R. H. (1976). Risk of new myocardial infarction in middle-aged men with manifest coronary heart disease. Circulation, 53, 342-347.
- Jenkins, C. D., Zyzanski, S. J., and Rosenman, R. H. (1979). Manual for the Jenkins Activity Survey. New York: Psychological Corporation.
- Jenkins, C. D., Zyzanski, S. J., Rosenman, R. H., & Cleveland, G. (1971). Association of coronary-prone behavior scores with recurrence of coronary heart disease. Journal of Chronic Diseases, 24, 601-611.
- Kannel, W. B., & Gordon, T. (1974). The Framingham Study. DHEW Publication (NIH) 74-599. Washington, D.C.: U.S. Government Printing Office.
- Keith, R. A., Lown, B., & Stare, F. J. (1965). Coronary heart disease and behavior patterns: an

- examination of method. Psychosomatic Medicine,
27, 424-434.
- Keys, A., Aravanis, C., Blackburn, H., Vanbuchem, F. S.
 P., Buzina, R., Djordjenic, B. S., Fidanza, F.,
 Karvonen, M. J., Menotti, A., Puuddu, V., & Taylor,
 H. L. (1972). Probability of middle-aged men
 developing coronary heart disease in 5 years.
Circulation, 45, 815-828.
- Kozarevic, D., Pirc, B., Ravic, Z., Dawber, T. R.,
 Gordon, T., & Zukel, W. J. (1976). The
 Yugoslavia cardiovascular disease study. Part II:
 factors in the incidence of coronary heart
 disease. American Journal of Epidemiology, 104,
 133-140.
- Kudrow, L. (1978). Current aspects of migraine
 headache. Psychosomatics, 19, 48-57.
- Kudrow, L. and Sutkus, B. J. (1979). MMPI pattern
 specificity in primary headache disorders.
Headache, 19, 18-24.
- Levenkron, J. C., Cohen, J. D., Mueller, H. S., &
 Fisher, E. B. (1983). Modifying the Type A
 coronary-prone behavior pattern. Journal of
Consulting and Clinical Psychology, 51, 192-204.
- Lovallo, W. R. and Fishkin, V. (1980). A
 psychophysiological comparison of Type A and B men
 exposed to failure and uncontrollable noise.
Psychophysiology, 17, 29-36.

- MacDougall, J. M., Dembroski, T. M., & Musante, L. (1979). The structured interview and questionnaire methods of assessing coronary-prone behavior in male and female college student. Journal of Behavioral Medicine, 2, 71-84.
- Manuck, S. B., Craft, S., & Gold, J. (1978). Coronary prone behavior pattern and cardiovascular response. Psychophysiology, 15, 403-411.
- Manuck, S. B. & Garland, F. N. (1979). Coronary prone behavior pattern, task incentive, and cardiovascular response. Psychophysiology, 16, 135-142.
- Matthews, K. A. (1982). Psychological perspectives on the Type A behavior pattern. Psychological Bulletin, 91, 291-323.
- Matthews, K. A. & Carra, J. (1982). Suppression of menstrual distress symptoms: a study of Type A behavior. Personality and Social Psychology Bulletin, 8, 146-151.
- Matthews, K. A. & Haynes, S. G. (1986). Type A behavior pattern and coronary disease risk: update and critical evaluation. American Journal of Epidemiology, 123, 923-960.
- Nowack, K. & Sessenrath, J. (1980). Coronary-prone behavior, locus of control and anxiety. Psychological Reports, 47, 359-364.

- O'Brien, M. D. (1971). Cerebral blood flow changes in the migraine headache. Headache, 10, 139-143.
- Olton, D. S., & Noonberg, A. R. (1980). Biofeedback: clinical applications in behavioral medicine. Englewood Cliffs, N.J.: Prentice Hall.
- Phillips, C. (1976). Headache and personality. Journal of Psychosomatic Research, 20, 535-542.
- Pilowsky, I. & Spence, N. D. (1983). Manual for the IBQ (second edition).
- Raskin, N. H., & Appenzeller, O. (1980). Headache. In L.H. Smith, Jr. (Ed), Major problems in internal medicine (vol 19). Philadelphia: W. B. Saunders.
- Rogado, A. Z., Harrison, R. H., & Graham, J. R. (1974). Personality profiles in cluster headache, migraine, and normal controls. Archives of Neurobiology, 37, 227-241.
- Rosenman, R. H. (1978). The interview method of assessment of the coronary-prone behavior pattern. In T.M. Dembroski, S.M. Weiss, J.L. Shields, S.G. Haynes, & M. Feinleib (Eds.), Coronary-Prone Behavior. New York: Springer-Verlag.
- Rosenman, R. H., Brand, R. J., Jenkins, C. D., Friedman, M., Straus, R., and Wurm, M. (1975). Coronary heart disease in the Western Collaborative Group Study: final follow-up experience of 8.5 years.

Journal of the American Medical Association, 233,
872-877.

Rosenman, R. H., Brand, R. J., Sholtz, R. I., &
Friedman, M. (1976). Multivariate prediction of
coronary heart disease during 8.5 year follow-up
in the Western Collaborative Group Study.

American Journal of Cardiology, 37, 903-910.

Rosenman, R. H. & Chesney, M. A. (1980). The
relationship of the Type A behavior pattern to
coronary heart disease. Activitas Nervosa
Superior, 22, 1-45.

Rosenman, R. H. & Friedman, M. (1961). Association of
a specific overt behavior pattern in females with
blood and cardiovascular findings. Circulation,
24, 1173-1184.

Rosenman, R. H., Friedman, M., Jenkins, C. D., Straus,
R., Wurm, M., & Kositchek, R. (1967). Recurring
and fatal myocardial infarction in the Western
Collaborative Group Study. American Journal of
Cardiology, 19, 771-775.

Rosenman, R. H., Friedman, M., Straus, R., Jenkins, C.
D., Zyzanski, S. J., and Wurm, M. (1970).
Coronary heart disease in the Western
Collaborative Group Study: A follow-up experience
of 4.5 years. Journal of Chronic Diseases, 23,
173-190.

Rosenman, R. H., Friedman, M., Straus, R., Wurm, M.,
Kositchek, R., Hahn, W., and Werthessen, N. T.

- A predictive study of coronary heart disease: The Western Collaborative Group Study. Journal of the American Medical Association, 189, 15-22.
- Roskies, E., Kearney, H., Spevack, M., Surkis, A., Cohen, C., & Gilman, S. (1979). Generalizability and durability of treatment effects in an intervention program for coronary-prone (Type A) managers. Journal of Behavioral Medicine, 2, 195-207.
- Roskies, E., Spevack, M., Surkis, A., Cohen, C., & Gilman, S. (1978). Changing the coronary-prone (Type A) behavior pattern in a nonclinical population. Journal of Behavioral Medicine, 1, 201-216.
- Scherwitz, L., Berton, K., & Leventhal, H. (1978). Type A assessment and interaction in the behavior pattern interview. Psychosomatic Medicine, 39, 229-240.
- Schucker, B. & Jacobs, J. R. (1977). Assessment of behavioral risk for coronary disease by voice characteristics. Psychosomatic Medicine, 39, 219-228.
- Sicuteri, F. (1967). Vasoneuroreactive substances and their implications in vascular pain. In A.P. Friedman (Ed.), Research and clinical studies of headache. Baltimore: Williams & Wilkens.
- Sigler, L. H. (1959). The mortality from arteriosclerotic and hypertensive heart diseases in the United States. Part I: possible relation

- distribution of population and economic status.
American Journal of Cardiology, 1, 605.
- Sparacino, J. (1979). The Type A behavior pattern: a critical assessment. Journal of Human Stress, 5, 37-51.
- Speilberger, C. D., Gorsuch, R. L., & Lushene, R. E. (1970). The manual for the STAI. Palo Alto: Consulting Psychologists Press, Inc.
- Suinn, R. M., & Bloom, L. J. (1978). Anxiety management training for pattern A behavior. Journal of Behavioral Medicine, 1, 25-35.
- Thurman, C. W. (1985). Effectiveness of cognitive-behavioral treatments in reducing Type A behavior among university faculty. Journal of Counseling Psychology, 32, 74-83.
- Thurstone, L. L. (1953). Thurstone Temperament Schedule. Science Research Associates: Chicago.
- Tunis, M. M. and Wolff, H. G. (1952). Analysis of cranial artery pulse waves in patients with vascular headache of the migraine type. American Journal of Medical Science, 224, 565-568.
- Turkat, I. D. & Pettegrew, L. D. (1984). Development and validation of the Illness Behavior Inventory. Journal of Behavioral Assessment, 5, 35-47.
- Wadden, T. A., Anderton, C. H., Foster, G. D., & Love, W. (1983). The Jenkins Activity Survey: Does it

- measure psychopathology? Journal of Psychosomatic Research, 27, 321-325.
- Wallston, B. S., Wallston, K. A., Kaplan, G. D., & Maides, S. A. (1976). Development and validation of the Health Locus of Control Scale. Journal of Consulting and Clinical Psychology, 44, 580-585.
- Waters, W. E. and O'Connor, P. J. (1971). Epidemiology of headache in women. Journal of Neurology, Neurosurgery, and Psychiatry, 34, 148-153.
- Watkins, P. L. (1986). Behavioral assessment of interpersonal skill among Type A and B college students. Unpublished doctoral dissertation.
- Watkins, P. L. & Eisler, R. M. (1986, March). Behavioral assessment of interpersonal skill among Type A and B college students. Paper presented at the annual meeting of the Society of Behavioral Medicine, San Francisco.
- Watson, D. & Friend, R. (1969). Measurement of social-evaluative anxiety. Journal of Consulting and Clinical Psychology, 33, 448-457.
- Weidner, G. & Matthews, K. A. (1978). Reported physical symptoms elicited by unpredictable events and the Type A coronary-prone behavior pattern. Journal of Personality and Social Psychology, 36, 1213-1220.
- Williams, R. B. (1975). Physiologic mechanisms underlying the association between psychosocial

- and coronary heart disease. In W.D. Gentry & R.B. Williams (Eds.), Psychosocial aspects of myocardial infarction and coronary care. St. Louis: C.V. Mosby, 37-50.
- Williams, R. B., Friedman, M., Glass, D. C., Herd, J. A., & Schneiderman. (1978). Section summary: Methods of linking behavioral and pathophysiological processes. In T.M. Dembroski, S.M. Weiss, J.L. Shields, S.G. Haynes, & M. Feinleib (Eds.), Coronary-prone behavior. New York: Springer-Verlag, 120-128.
- Williamson, D. A. (1981). Behavioral treatment of migraine and muscle contraction headaches: outcome and theoretical explanations. Progress in Behavior Modification, 2, 163-201.
- Wolff, H. G. (1963). Headache and other Head Pain. London: Oxford University Press.
- Woods, P. J., Morgan, B. T., Day, B. W., Jefferson, T., and Harris, C. (1984). Findings on a relationship between Type A behavior and headaches. Journal of Behavioral Medicine, 7, 277-286.
- Zyzanski, S. J. & Jenkins, C. D. (1970). Basic dimensions within the coronary prone behavior pattern. Journal of Chronic Diseases, 22, 781-795.
- Zyzanski, S. J., Jenkins, C. D., Ryan, T. J., Flessas, A., & Everist, M. (1976). Psychological

coronary angiographic findings. Archives of
Internal Medicine, 136, 1234-1237.

Appendices

Headache intensity rating (1 - 10) with anchors/adjectives.

Rating	Descriptor
1	Just Noticeable
2	Weak
3	Mild
4	Uncomfortable
5	Strong
6	Intense
7	Severe
8	Very intense
9	Intolerable
10	Excruciating

PLEASE NOTE:

Copyrighted materials in this document have not been filmed at the request of the author. They are available for consultation, however, in the author's university library.

These consist of pages:

Assertion Inventory	118-119
Fear of Negative Evaluation Scale	121-
IBI	123-124
Illness Behavior Questionnaire	125-126
Social Avoidance and Distress Scale	128-129

**University
Microfilms
International**

300 N Zeeb Rd., Ann Arbor, MI 48106 (313) 761-4700

DAILY STRESS INVENTORY

Subject: _____

Date: _____

Below are listed a variety of events that may be viewed as stressful or unpleasant. Read each item carefully and decide whether or not that event occurred within the past 24 hours. If the event did not occur, place an "X" in the space next to that item. If the event did occur, indicate the amount of stress that it caused you by placing a number from zero to 7 in the space next to that item (see numbers below). Please answer as honestly as you can so that we may obtain accurate information.

X = did not occur (past 24 hrs.) 3 = caused a little stress 6 = caused very
1 = occurred but was not stressful 4 = caused some stress much stress
2 = caused very little stress 5 = caused much stress 7 = caused me to
panic

1. Performed poorly at task _____	32. Argued with spouse/boyfriend/
girlfriend _____
2. Performed poorly due to others _____	33. Argued with another person _____
3. Thought about unfinished work _____	34. Waited longer than you wanted _____
4. Hurried to meet deadline _____	35. Interrupted while thinking/
relaxing _____
5. Interrupted during task /
activity _____	36. Someone "cut" ahead of you in
a line _____
6. Someone spoiled your completed
task _____	37. Performed poorly at sport/game _____
7. Did something you are
unskilled at _____	38. Did something that you did not
want to do _____
8. Unable to complete a task _____	39. Unable to complete all plans
for today _____
9. Was unorganized _____	40. Had car trouble _____
10. Criticized or verbally
attacked _____	41. Had difficulty in traffic _____
11. Ignored by others _____	42. Money problems _____
12. Spoke or performed in public _____	43. Store lacked a desired item _____
13. Dealt with rude waiter/
waitress/salesperson _____	44. Misplaced something _____
14. Interrupted while talking _____	45. Bad weather _____
15. Was forced to socialize _____	46. Unexpected expenses (fines,
traffic ticket, etc.) _____
16. Someone broke a promise/
appointment _____	47. Had confrontation with an
authority figure _____
17. Competed with someone _____	48. Heard some bad news _____
18. Was stared at _____	49. Concerned over personal appearance _____
19. Did not hear from someone
you expected to hear from _____	50. Exposed to feared situation or
object _____
20. Experienced unwanted physical
contact (crowded, pushed) _____	51. Exposed to upsetting TV show,
movie, book _____
21. Was misunderstood _____	52. "Pet peeve" violated (someone
fails to knock, etc.) _____
22. Was embarrassed _____	53. Failed to understand something _____
23. Had your sleep disturbed _____	54. Worried about another's problems _____
24. Forgot something _____	55. Experienced narrow escape from
danger _____
25. Feared illness/pregnancy _____	56. Stopped unwanted personal habit
(overeating, smoking, nailbiting) _____
26. Experienced illness/physical
discomfort _____	57. Had problem with kid(s) _____
27. Someone borrowed something
without your permission _____	58. Was late for work/appointment _____
28. Your property was damaged _____	Any stressors that we missed? (list below)
29. Had minor accident (broke
something, tore clothing) _____	59. _____
30. Thought about the future _____	60. _____
31. Ran out of food/personal
article _____	

HLC

For each statement below circle the number which indicates how much you either agree or disagree with it. Use the following scale:

	1....	2....	3....	4....	5....	6
	strongly disagree					strongly agree
1. If I take care of myself, I can avoid illness	1	2	3	4	5	6
2. Whenever I get sick, it is because of something I've done or not done	1	2	3	4	5	6
3. Good health is largely a matter of good fortune	1	2	3	4	5	6
4. No matter what I do, If I am going to get sick I will get sick	1	2	3	4	5	6
5. Most people do not realize the extent to which their illnesses are controlled by accidental happenings	1	2	3	4	5	6
6. I can only do what my doctor tells me to do	1	2	3	4	5	6
7. There are so many strange diseases around that you can never know how or when you might pick one up	1	2	3	4	5	6
8. When I feel ill, I know it because I have not been getting the proper exercise or eating right	1	2	3	4	5	6
9. People who never get sick are just plain lucky	1	2	3	4	5	6
10. People's ill health results from their own carelessness	1	2	3	4	5	6
11. I am directly responsible for my health	1	2	3	4	5	6

Self-Evaluation Questionnaire

Directions: A number of statements which people have used to describe themselves are given below. Read each statement and then rate how you generally feel on the 1 to 4 rating scale below. There are no right or wrong answers.

	almost never			almost always
1. I feel pleasant	1	2	3	4
2. I tire quickly	1	2	3	4
3. I feel like crying	1	2	3	4
4. I wish I could be as happy as others	1	2	3	4
5. I am losing out on things because I can't make up my mind soon enough	1	2	3	4
6. I feel rested	1	2	3	4
7. I am "calm, cool, and collected"	1	2	3	4
8. I feel that difficulties are piling up so that I cannot overcome them	1	2	3	4
9. I worry too much over something that really doesn't matter	1	2	3	4
10. I am happy	1	2	3	4
11. I am inclined to take things hard	1	2	3	4
12. I lack self-confidence	1	2	3	4
13. I feel secure	1	2	3	4
14. I try to avoid facing a crisis or difficulty	1	2	3	4
15. I feel blue	1	2	3	4
16. I am content	1	2	3	4
17. Some unimportant thought runs through my mind and bothers me	1	2	3	4
18. I take disappointments so keenly that I cannot put them out of my mind	1	2	3	4
19. I am a steady person	1	2	3	4
20. I get in a state of tension or turmoil as I think over my recent concerns and interests	1	2	3	4

Table 24

Group means for Assertion Inventory-RP (n = 46).

<u>JAS Group</u>	<u>Headache Diagnosis</u>		
	Migraine	Muscle Contraction	
A	99.36	102.71	101.04
X	113.67	107.64	110.65
B	105.50	111.29	108.39
	106.18	107.21	

Table 25

Group means for Assertion Inventory-DD (n = 46).

<u>JAS Group</u>	<u>Headache Diagnosis</u>		
	Migraine	Muscle Contraction	
A	88.18	94.57	91.38
X	104.67	88.55	96.61
B	77.75	109.14	93.45
	90.20	97.42	

Table 26

Group means for DSI-Frequency (n = 49).

<u>JAS Group</u>	<u>Headache Diagnosis</u>		
	Migraine	Muscle Contraction	
A	12.58	11.07	11.83
X	11.81	10.74	11.28
B	9.28	14.82	12.05
	11.23	12.21	

Table 27

Group means for DSI-Sum (n = 49).

<u>JAS Group</u>	<u>Headache Diagnosis</u>		
	Migraine	Muscle Contraction	
A	33.24	26.92	30.20
X	32.49	27.22	29.85
B	23.12	24.22	23.67
	29.70	26.12	

Table 28

Group means for FNE (n = 57).

<u>JAS Group</u>	<u>Headache Diagnosis</u>	
	Migraine	Muscle Contraction
A	12.27	15.00
X	16.88	8.69
B	11.25	11.62
	13.46	11.77

Table 29

Group means for HAF (n = 60)

<u>JAS Group</u>	<u>Headache Diagnosis</u>		
	Migraine	Muscle Contraction	
A	13.06	24.71	18.89
X	9.89	17.92	13.91
B	14.20	20.00	17.10
	12.38	20.88	

Table 30

Group means for HAI (n = 60)

<u>JAS Group</u>	<u>Headache Diagnosis</u>		
	Migraine	Muscle Contraction	
A	4.25	3.57	3.91
X	4.24	3.89	4.07
B	2.94	3.25	3.09
	3.81	3.57	

Table 31

Group means for HLC (n = 56)

<u>JAS Group</u>	<u>Headache Diagnosis</u>	
	Migraine	Muscle Contraction
A	32.73	39.29
X	36.71	34.54
B	39.50	35.90
	35.98	36.57

Table 32

Group means for IBI (n = 59).

<u>JAS Group</u>	<u>Headache Diagnosis</u>		
	Migraine	Muscle Contraction	
A	58.37	52.57	55.47
X	74.12	58.15	66.14
B	80.40	64.60	72.50
	70.97	58.44	

Table 33

Group means for IBQ scales (n = 54).

Group	Illness Behavior Questionnaire Scale			
	2	3	7	WI
MG	2.43	1.17	2.01	3.93
MC	1.92	1.14	1.67	3.69
Type A	1.64	1.60	2.07	2.58
Type X	2.63	1.12	1.83	4.73
Type B	2.25	.75	1.62	4.13
MG-A	1.79	1.86	2.14	3.00
MG-X	3.00	.90	1.90	5.80
MG-B	2.50	.75	2.00	3.00
MC-A	1.50	1.33	2.00	2.17
MC-X	2.25	1.33	1.75	3.67
MC-B	2.00	.75	1.25	5.25

Table 34

Group means for MMPI scales (n = 54).

Group	MMPI Scale									
	L	F	K	1	2	3	4	5	6	7
MG	4.49	4.42	12.46	62.10	56.14	61.12	56.26	44.03	52.40	53.47
MC	4.57	4.75	13.11	65.33	61.67	64.11	56.74	53.23	55.66	59.93
Type A	4.27	4.91	12.90	58.23	55.74	58.64	54.87	50.60	55.26	55.53
Type X	3.93	5.33	11.60	69.41	63.41	66.27	60.45	45.48	56.52	62.02
Type B	5.38	3.50	14.06	63.50	57.56	62.94	54.19	49.81	50.31	52.56
MG-A	5.50	4.00	15.00	60.50	53.75	61.50	57.00	45.25	47.75	49.00
MG-X	4.13	5.00	10.12	68.62	59.75	62.87	58.62	41.50	54.37	57.50
MG-B	3.83	4.25	12.25	57.17	54.92	59.00	53.17	45.33	55.08	53.92
MC-A	5.25	3.00	13.12	66.50	61.37	64.37	51.37	54.37	52.87	56.12
MC-X	3.73	5.67	13.07	70.20	67.07	69.97	62.27	49.47	58.67	66.53
MC-B	4.71	5.57	13.14	59.29	56.57	58.29	56.57	55.86	55.43	57.14

Table 34

Group means for MMPI scales (n = 54).

Group	MMPI Scale		
	8	9	0
MG	53.07	56.28	57.99
MC	56.91	54.66	58.38
Type A	57.27	55.97	59.88
Type X	58.38	58.31	59.79
Type B	49.31	52.12	54.87
MG-A	55.83	56.08	60.33
MG-X	54.62	58.75	61.37
MG-B	48.75	54.00	52.25
MC-A	58.71	55.86	59.43
MC-X	62.13	57.87	58.20
MC-B	49.87	50.25	57.50

Table 35

Group means for SAD (n = 57).

<u>JAS Group</u>	<u>Headache Diagnosis</u>		
	Migraine	Muscle Contraction	
A	10.87	8.25	9.56
X	12.12	5.92	9.02
B	2.75	13.12	7.94
	8.58	9.10	

Table 36

Group means for STAI (n = 60)

<u>JAS Group</u>	<u>Headache Diagnosis</u>	
	Migraine	Muscle Contraction
A	44.19	43.14
X	43.44	43.77
B	32.80	43.20
	40.14	43.37

Table 37

Group means for Zung (n = 60)

<u>JAS Group</u>	<u>Headache Diagnosis</u>	
	Migraine	Muscle Contraction
A	38.31	36.43
X	37.33	38.77
B	33.40	36.70
	36.35	37.30

CURRICULUM VITAE

Neil B. Rappaport, Ph.D.

Current Address: University of Alabama at Birmingham
Division of General and
Preventive Medicine
1717 11th Ave South
Birmingham, AL 35294

Educational Background:

1986-present	University of Alabama at Birmingham Division of General and Preventive Medicine Post-Doctoral Fellowship
1985-1986	Univ. of Mississippi Medical Center Dept. of Psychiatry and Human Behavior Clinical Psychology Residency
1981-1985	Louisiana State University Dept. of Psychology Clinical Psychology Doctoral Program
1979-1981	San Diego State University Dept. of Psychology Experimental Psych. Masters Program
1976-1979	San Diego State University Dept. of Psychology B.A. (Major: Psychology)_
1975-1976	Grossmont College
1973-1975	University of California, San Diego

Professional Memberships:

Association for the Advancement of Psychology
American Psychological Association
Association for the Advancement of Behavior Therapy
Southeastern Psychological Association

Publications:

Brantley, P. J., Waggoner, C. D., Jones, G. N., &
Rappaport, N. B. (in press). A daily stress
inventory: Development, reliability, and validity.
Journal of Behavioral Medicine.

- Rappaport, N. B., McAnulty, D. P., Waggoner, C. D., Brantley, P. J. (in press). Cluster analysis of MMPI profiles in a chronic headache population. Journal of Behavioral Medicine.
- Dubbert, P. M., Rappaport, N. B., & Martin, J. E. (in press). Exercise in cardiovascular disease. Behavior Modification.
- Osborne, Y. H., Hinz, L. D., Rappaport, N. B., Williams, H. S., & Tuma, J. T. (in press). Social attractiveness, temperament, and socioeconomic status as predictors of tendency to report child abuse. Journal of Social and Clinical Psychology.
- Osborne, Y. H., Rappaport, N. B., & Meyer, R. (in press). The role of persuasion in sentencing severity with mock jurors. Behavioral Sciences and the Law.
- Williams, H. S., Osborne, Y. H., & Rappaport, N. B. (in press). Child abuse reporting laws: Differences among professional groups in knowledge and compliance. The Southern Psychologist.
- Callon, E. B., Brantley, P. J., McAnulty, D. P., Waggoner, C. D., Rappaport, N. B., Jones, G. N., Goreczny, A. (1986). The effect of muscle contraction headache chronicity on frontal EMG. Headache, 26, 356-359.
- McAnulty, D. P., Rappaport, N. B., Waggoner, C. D., Brantley, P. J., Barkemeyer, C., & McKenzie, S. J. (1986). Psychopathology in volunteers for headache research: Early vs. later respondents. Headache, 26, 37-38
- McAnulty, D. P., Rappaport, N. B., & McAnulty, R. D. (1985). An a posteriori investigation of the standard MMPI validity scales. Psychological Reports, 57, 95-98.
- Osborne, Y. H. & Rappaport, N. B. (1985). Influence of seriousness of charge, defendant's race and SES, and juror characteristics in sentencing severity. Behavioral Sciences and the Law.
- Rappaport, N. B., & McAnulty, D. P. (1985). The effect of accented speech on the scoring of ambiguous WISC-R responses by prejudice and non-prejudice raters. Journal of Psychoeducational Assessment, 3, 275-283.

DOCTORAL EXAMINATION AND DISSERTATION REPORT

Candidate: Neil B. Rappaport

Major Field: Psychology

Title of Dissertation: An Exploration of the Type a Behavior Pattern in Chronic Headache Sufferers

Approved:

Major Professor and Chairman

Dean of the Graduate School

EXAMINING COMMITTEE:

Date of Examination:

October 10, 1986