DIFFERENTIAL APPLICATION
OF COGNITIVE AND BEHAVIORAL TREATMENTS
FOR MIGRAINE

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Master of Arts

by
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May 1984
DIFFERENTIAL APPLICATION OF COGNITIVE AND BEHAVIORAL TREATMENTS FOR MIGRAINE

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Differential Application of Behavioral and Cognitive Treatments for Migraine

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The problem. While research has demonstrated the effectiveness of behavioral and, more recently, cognitive treatments for migraine, exclusively-behavioral and cognitive treatments have not been compared. Additionally, few variables have been identified as predictors of differential treatment response.

Procedure. A 2 (locus of control) x 2 (treatments) stratified block design was used to investigate the interaction of locus of control with treatments for migraine, in order to help clarify the interaction of subject variables with treatment and to compare the effectiveness of procedurally similar interventions, differing primarily with respect to treatment orientation. A total of 16 community residents, screened as suffering from migraine or combined muscle contraction-migraine headaches, were classified as either internals or externals and randomly assigned to one of two treatment conditions: behavioral self-control plus relaxation or cognitive coping plus relaxation. Multiple measures were administered over time.

Findings. Results failed to support a differential treatment approach based on locus-of-control orientation or greater therapeutic efficacy for either the cognitive or behavioral treatments for migraine. Exploratory analyses did reveal that substantially more cognitive-group, rather than behavioral-group, participants reported applying treatment-related coping strategies to control headache. Pain pattern was also found to be significantly correlated with treatment outcome.

Conclusions. Findings support continued investigation of the cognitive-behavioral treatment distinction in migraine research.

Recommendations. Additional comparisons between more effective behavioral and cognitive treatments for migraine, more rigorous assessment of whether group participants acquired intended treatment techniques and further investigation of the interaction of treatments with locus of control are needed. Pain location, headache frequency, headache type, and some scales of Melzack's Pain Questionnaire and Lanyon's Psychological Screening Inventory also merit rigorous investigation to see if prediction of outcome can be improved.
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Chapter 1

INTRODUCTION AND REVIEW OF THE LITERATURE

Migraine is a painful, debilitating condition, conservatively estimated to afflict at least 12 million Americans. Distinguished from the more commonly occurring muscle tension headache by its vascular nature, migraine is characterized as a periodic pain of widely varying intensity, frequency and duration, commonly unilateral and pulsating in onset. Attacks may be accompanied by any one or number of the following symptoms: nausea, vomiting, diarrhea, constipation, anorexia, extreme irritability, chills, blushing, sweating or edema of the hands or face. Some may also be preceded by a distinct prodromal phase, consisting of conspicuous visual, motor or mood disturbances. Although pain is usually limited to the head, it may include the face (Ad Hoc Committee on Classification of Headache, 1962; Dalessio, 1972). There is often a history of migraine in the patient's family and it appears to afflict women more often than it does men.

The etiology of migraine remains unclear, although there is a general consensus that the precipitants are psychophysiological. Vascular, biochemical, genetic, neuromuscular, dietary, hormonal, personality, and situational factors have all been cited as precipitating migraine attacks (Adams, Feurnstein, & Fowler, 1980; Bakal, 1975; Ward, 1982). Specific vascular mechanisms believed to be involved include vasoconstriction of the extra-cranial arteries during the preheadache or prodromal phase, followed by a rebound vasodilation of
the same arteries during the painful headache phase.

The activity of biochemical factors in pain production is suggested to operate as follows: a release of platelet serotonin is speculated to produce the vasoconstriction associated with the prodromal phase of the migraine attack. A subsequent depletion of serotonin decreases the normal tonus of the affected cranial arteries and results in a passive vasodilatation of the arterial walls. In conjunction with this activity, pain producing histamines and kinins are presumably synthesized and released, reducing the pain threshold of the cranial arteries involved. The combination of vasodilatation and biochemical activity produces migraine headache pain (Adams et al., 1980).

Contraction of the scalp muscles is also believed to cause pain, but only when the local pain threshold is lowered. The subsequent lowering of pain threshold as a result of biochemical activity, therefore, increases the likelihood that painful muscle contraction symptoms will occur. Ward (1982) even suspects that a "vicious cycle" is established where muscle contraction occurs in almost all headaches, regardless of cause.

The chief chemical agents found in food which have been implicated in precipitating migraine attacks include tyramine (found in cheese, fish, beans and dairy products), histamine, sodium nitrite and monosodium glutamate. Tyramine and histamine are suspected to produce cerebral vasoconstriction which in turn gives rise to a rebound vasodilatation and onset of headache pain. Anecdotal reports of people being cured from migraine by removal of particular foods such as chocolate, sugar, fried foods and alcohol also exist. Allergic reactions due to food sensitivity could conceivably induce a headache.
by producing vasomotor changes in the nose which may then lead to headache (Dalessio, 1972). However, no well-controlled studies have provided evidence directly linking specific food allergens to the production of headache pain.

The relevance of sleep for migraine-susceptible individuals has also been considered. It has been suggested that the slow respiration associated with deep sleep gives rise to excess amounts of carbon dioxide in the blood and, consequently, produces vasodilatation which initiates migraine attacks. *Reductions in the amount of sleep up to 6-7 hours has decreased migraine headache frequency for some individuals.*

Considerable clinical agreement exists with respect to the personality characteristics of migraine headache sufferers. They have commonly been described as perfectionistic, achievement-oriented, situationally-anxious and routing-regimented individuals (Mitchell & Mitchell, 1971).

Although familial incidence data are supportive of an inherited predisposition to migraine, the hypothesized role of heredity is tentative, at best. Wolff (cited in Dalessio, 1972) suspects that genetic and certain situational factors interact. He presumes that susceptibility to migraine is determined by genetic factors which are manifested in headache when the individual fails to cope with antecedent psychological stress (see also Henryk-Gutt & Rees, 1973). Evidence has been presented linking the effects of continued stress to undesirable changes in the cardiovascular system and to other physiological processes as well (Kiritz & Moos, 1974).

Thus, it can be argued, from several perspectives, that migraine is a vascular response to situations in which the individual experiences
stress. For this reason, Mitchell and Mitchell (1971) argue that a major goal of treatment should be to increase the migraine patient's ability to modify or control stressful environmental situations and his emotional reactivity to stress. Similarly, on the basis of his clinical experience, Wolff (cited in Dalessio, 1972) estimated that approximately two thirds of those afflicted with migraine can be helped by getting them to change their attitudes and beliefs. These approaches to the treatment of migraine would seem to have greater preventative utility over pharmacological interventions which are designed primarily for pain termination. Critical reviews of the treatment literature support this view by suggesting that (a) pharmacological intervention is inadequate as the sole treatment for headache and (b) behavioral-psychological techniques hold the most promise for reducing or eliminating headache pain (Adams et al., 1980; Bakal, 1975).

Since extracranial vasodilatation is believed to be a major pain mechanism of the migraine attack, any procedure that interrupts or reduces this dilatation is likely to reduce the intensity of the attack. Thus procedures such as application of pressure to the common carotid artery or any of its external branches (e.g., temporal, occipital or supraorbital arteries), placing an ice cap over these vessels, breathing of 100% oxygen (or a mixture of 90% oxygen and 10% carbon dioxide), and even standing on one's head have been cited as providing some pain relief (Dalessio, 1972); however, effects are short-lived or unpredictable and cannot be relied upon for therapeutic use.
Biofeedback and Relaxation Training

Recent applications of autogenic plus temperature biofeedback training packages (Blanchard, Theobald, Williamson, Silver, & Brown, 1978; Medina, Diamond, & Franklin, 1976; Sargent, Green, & Walters, 1973), cephalic blood volume pulse (BVP) biofeedback (Bild & Adams, 1980; Friar & Beatty, 1976; Sturgis, Tollison, & Adams, 1978), electromyograph frontalis (EMG) biofeedback (Bild & Adams, 1980; Medina et al., 1976; Sturgis et al., 1978), and relaxation training (Blanchard et al., 1978; Lutker, 1971) have been the focus of behavioral-psychological treatments for migraine. These have achieved a measure of success in alleviating or eliminating migraine headache symptoms by training individuals to voluntarily raise finger temperature, reduce muscle tension or produce vasoconstriction in their cranial artery at the perceived onset of headache symptoms.

Initially, relaxation and EMG biofeedback training were included in some studies as control conditions but were found to be therapeutically effective for treating migraine, contrary to original expectations. For example, Blanchard et al. (1978) demonstrated that a progressive muscle relaxation control was as effective as temperature biofeedback plus autogenic training at follow-up, and that relaxation training was even more effective than biofeedback at the end of treatment. Bild and Adams (1980) compared the effectiveness of BVP biofeedback, and EMG biofeedback control and a waiting list control. They found that both BVP and EMG biofeedback were effective treatments for migraine, although the BVP feedback emerged superior to that of EMG. BVP training appears to specifically alter an important physiological pain mechanism involved
in migraine, that of vasodilatation. However, the manner in which temperature biofeedback, EMG biofeedback and relaxation training operate to produce migraine symptom relief is not yet clear. Sturgis et al. (1978) treated two individuals with combined migraine and tension headache symptoms and separately assessed the effects of BVP and EMG biofeedback on these. The BVP training produced reductions in migraine but not tension headache symptoms, whereas the EMG training had the reverse effect. His results (a) support the independence between the dual pain mechanisms of vasodilatation and muscle contraction hypothesized to be involved in combination headache and (b) highlight the potential usefulness of obtaining separate assessments of migraine and tension headache symptoms for detecting differential treatment effects, even in predominately migraine headache sufferers. It is likely that these people may not discriminate or report the presence of tension headache symptoms, especially if their migraine symptoms are much more severe.

Closer examination of the nonspecific effects of biofeedback and relaxation treatments for tension headache sufferers has been prompted by results of studies demonstrating minimal correspondence between learned control of frontal EMG and headache improvement (Epstein & Abel, 1977; Holroyd, Andrasik, & Westbrook, 1977). In one study investigating the effects of biofeedback for tension headache, Holroyd and Andrasik (1980) found that all subjects receiving treatment significantly improved in comparison to a no-treatment (self-recording only) control, irrespective of whether they learned to decrease, increase or maintain constant levels of frontal EMG. In an attempt to account for nonspecific effects, the authors questioned subjects
at different points throughout the study, asking them to enumerate which strategies they learned to use to control their headaches as a function of treatment. Most reported devising and using specific behavioral or cognitive coping strategies in headache-eliciting situations, even though they never received explicit instruction in these techniques. Other researchers utilizing biofeedback and relaxation treatments for tension headache have implicated that similar non-specific effects contribute importantly to symptom relief (Budzinski, Stoyva, & Adler, 1970; Holroyd, Andrasik & Noble, 1980; Holroyd et al., 1977). This suggests that specifically incorporating behavioral or cognitive self-control components into relaxation oriented treatments for tension headache might increase therapeutic efficacy. Reeves (1976) used a combination cognitive plus EMG biofeedback training procedure for treating a case of tension headache and obtained effective results.

**Behavioral Therapies**

Mitchell and White (1977) demonstrated the applicability of the above speculation in the treatment of migraine. They trained individuals in self-recording, self-monitoring and the following two automated levels of behavioral self management and self control: (1) skill acquisition which consisted of muscle, mental and differential relaxation and self-desensitization and (2) skill acquisition which involved training in acquisition of thirteen additional behavioral and cognitive self-help skills. Although training in stage 1 of behavioral self-management produced a 45% reduction in
headache frequency, training in acquisition of additional behavioral and cognitive coping skills resulted in significantly greater headache improvement. The authors concluded that an increase in the range of skills learned provided individuals with greater control over problematic antecedent stimuli and thereby furthered headache relief. The incorporation of strategies which encourage individuals to alter stressful environmental situations, into relaxation or biofeedback treatment packages for migraine, would appear to enhance treatment efficacy by producing changes in the migraine sufferer's vasoreactive chain of events at an early point in time. This is consistent with Mitchell's (1971) earlier study where he found a combination of relaxation training, desensitization and assertive therapy to be superior to that of relaxation training alone in treating migraine headaches.

Most behavioral self-control approaches to stress management typically proceed in a similar step-wise fashion. They train the individual to (a) identify environmental cues that trigger tension and anxiety, (b) observe his reaction to this situation and the consequences of his reaction, (c) objectify his problems in terms of behavioral excesses and deficits, (d) set goals, (e) work out a self-management strategy and (f) self-apply that strategy in stressful situations (see all of Mitchell's studies and also, Sanchez-Craig, 1976). However, many behavior therapists now maintain that maladaptive behavior and emotional arousal is often evoked by cognitively mediated activity such as self-verbalizations and visual imagery, rather than by the objective stimulus properties of the situation itself.
As a result, current cognitive learning therapies have been developed which follow a similar outline as the behavioral self-management approach described above, except that they focus on modifying the client's idiosyncratic self-statements and ideations, rather than emphasizing solely overt behavior change.

Cognitive Therapies

The emergence of cognitive therapies and their usefulness in clinical practice was a result of developments beginning within the boundaries of behavioral, as well as nonbehavioral, therapies. In reviewing this history, Mahoney and Amkoff (1978) identified two revolutionary developments that occurred within the area of behaviorism: (a) interest and research in the area of self-control (see Skinner, 1953) stimulated interest and controversy in the concept of reciprocal-determinism (a philosophy which views the individual as an active participant in his own development), as well as further scrutiny of concepts such as freedom, free will, and countercontrol, and (b) principles of operant and classical conditioning were extrapolated to private events (see Homme, 1965; Skinner, 1957). Thus, formerly disregarded covert behaviors were now considered appropriate topics of analysis for a science of behavior and became subject to the same experimental manipulations as overt events. Soon afterwards, applications of covert conditioning principles such as covert sensitization and covert reinforcement began to appear in the literature, and thoughts, feelings and images became targets of behavior change as well as a means for inducing other behavior change.
Mahoney and Arunkoff (1978) partly attribute the acceptance of behavior therapy within the domain of clinical psychology and psychiatry to the popularization of systematic desensitization in treating nonpsychotic adults. Because this behaviorally-based procedure is extensively reliant on mental imagery, it was described as receiving much empirical scrutiny from behavior therapists during the mid-1960s. With this investigation came a liberalization of operant technologies, such that behavioral treatments incorporated components such as instruction, modeling and substitution of verbal praise for prior tangible rewards instead of focusing primarily on manipulating immediate consequences. Outside of the behavioral domain, cognitive and social learning theorists (see Beck, 1970; Ellis, 1977) were offering theoretical models for clinical acceptance. Other behavior therapists (Bandura, 1969; Mischel, 1973) were conceptualizing cognitive and information processing models of behavior change. In this manner, the early conditioning analysis of self control was replaced by more mediational accounts and cognitive-behavior therapy became less distinct from other conceptual approaches.

Mahoney (in Mahoney & Arunkoff, 1978) describes the present state of affairs as relatively diversified in principles and procedures, but offers the following commonalities among cognitive-learning theory assumptions:

1. Humans develop adaptive and maladaptive behavior and affective patterns through cognitive processes (e.g., selective attention, symbolic coding).
2. These cognitive processes can be functionally activated
by procedures that are generally isomorphic with those
of the human learning laboratory (although there may be other
procedures which activate the cognitive processes as well).

3. The resultant task of the therapist is that of a
diagnostician-educator who assesses maladaptive cognitive
processes and subsequently arranges learning experiences that
will alter cognitions and the behavior and affect patterns
with which they correlate (p. 692).

The endorsement of the importance of cognitive processes, subject to
conventional principles of learning, distinguishes cognitive learning
therapies. Although different classifications of cognitive therapies,
such as cognitive restructuring (Beck, 1970; Ellis, 1977), coping-skills
therapies (Meichenbaum, 1977) and problem-solving therapies (D'Zurilla &
Goldfried, 1971; Mahoney & Arnow, 1978) exist, cognitive treatment
packages described in the literature often include combinations of the
above. All types train the individual to (a) discover and detect
maladaptive cognitions, (b) recognize their undesirable effect and
(c) replace them with more adaptive and incompatible thoughts.

Cognitive psychotherapies and cognitive-behavioral treatment
combinations have come into growing popularity with considerable
promise of effectiveness (Dush, Hirt & Schroeder, in press);
they have yet to be rigorously tested as a treatment for migraine.
They have, however, been demonstrated effective in the treatment
of chronic tension headache (Holroyd & Andrasik, 1978; Holroyd et al.,
1977) which, like migraine, is generally precipitated by
antecedent psychological stress.
In one study Holroyd et al. (1977) compared cognitive and biofeedback treatments with a waiting list control and found that only the cognitive group demonstrated substantial reductions in headache activity. These results particularly emphasize the importance of attending to the environmental antecedents of pain, since the biofeedback group did not show headache improvement in spite of being the only group to show reductions in frontal EMG.

In a second study Holroyd and Andrasik (1978) demonstrated significant advantages for the cognitive treatment of tension headache utilizing four groups: cognitive self-control, cognitive plus relaxation self-control, headache discussion and a symptom-monitoring control. The two cognitive groups and the headache discussion group were provided with similar rationales which encouraged subjects to adopt cognitively oriented explanations for their symptoms. Only the cognitive self-control groups received specific self-instructional coping strategies for managing stress and controlling headaches. All cognitively oriented treatments produced substantial reductions in headache symptoms over that of the symptom-monitoring control. These results raise questions about the effective components of the cognitive treatments, but suggest that there is therapeutic value in presenting a cognitively oriented treatment rationale. Other studies also support this implication (Thorpe, Amantu, Blakely & Burns, 1976; Wein, Nelson & Odom, 1975).

More recently, a cognitive-behavioral treatment for migraine headache sufferers, consisting of self-recording, self-monitoring, cognitive restructuring, guided imagery, self-reinforcement, muscle
tension relaxation and educational components, was compared to a "minimal treatment" control group containing self-recording and educational components, and focusing on muscle tension relaxation and active facilitation of group discussion (Dush & Konecky, 1982). No significant differences in overall post-treatment pain levels between conditions were observed. However, post-hoc analysis revealed a significant interaction between type of treatment presentation and initial headache frequency ($F = 4.92; p < .05$).

The cognitive treatment resulted in a significant reduction of headache ratings for individuals with initially low-frequency headaches, whereas the resource condition produced significant headache relief for individuals with initially high-frequency headaches. The investigators speculated that the high-frequency headache individuals who benefited from the relaxation training had primarily combined migraine and tension headache symptoms, whereas the low-frequency headache individuals who did not had primarily migraine headache symptoms. This was corroborated by the observation that 80% of high frequency subjects reported some degree of bilaterality of pain, compared to only 14% of low frequency subjects. The results merit further investigation on two counts: (a) the reliability of the two treatment effects needs to be verified in future replications, particularly since the headache frequency factor included in the design was derived from the same, relatively small sample and (b) variables in addition to headache frequency (e.g., type of headache or type of client) are speculated to be interacting with treatment effects; this requires clarification to allow for greater predictability of outcomes.
Rather than debate on the priority of cognitive, behavioral, or physiological variables in affecting maladaptive behavior, many investigators are focusing their efforts on identifying the type of client and clinical problems with which different therapies will have the most success. Studies investigating individual differences in response to treatment have found anxiety level (Meichenbaum, Gilmore, & Fedoravicious, 1971; Safran, Alden, & Davidson, 1980), subjects' conceptual level (Spoth & Meade, 1981), locus of control (Auerbach, Kendall, Cuttler, & Levitt, 1976; Houston, 1972; Kilmann, Albert, & Soltite, 1975; Friedman & Dies, 1974; Schwartz & Higgens, 1979), initial headache frequency (Dush & Konecky, 1982) and headache symptomatology (Sturgis et al., 1978) related to treatment outcome. However, only two of the above studies were designed for migraine headache sufferers. More investigations in this area are needed given the unique complexities of migraine etiology.

**Hypothesis for Present Investigation**

The present study was designed to provide a controlled investigation of cognitive and behavioral treatments for migraine, presented in combination with progressive muscle relaxation and matched according to subjects' locus of control. While a variety of programmed behavior therapy techniques have been experimentally tested for the treatment of migraine, the effectiveness of primarily cognitive therapies has only briefly been addressed. In addition, there are no studies to date comparing the effectiveness
of thorough cognitive and exclusively behavioral treatments for migraine. This comparison would provide useful information about the potential active ingredients of treatments for migraine, which have not yet been successfully identified. (Furthermore, investigations in this area are needed, considering the important role that precedent research has assigned to the modification of environmental and emotional variables in pain control.)

While cognitive and behavioral self control treatments for migraine are considered primarily preventive in nature and aimed toward reducing the incidence of headache, other procedures, such as relaxation training and pharmacological treatments, are geared toward minimizing headache intensity or duration once symptoms have appeared. Thus, relaxation training was incorporated into the cognitive and behavioral treatments for migraine (a) to provide migraine sufferers with a method of controlling their pain while they are acquiring coping strategies designed to prevent it, and (b) to assist in desensitizing individuals from conditioned fear responses to oncoming headaches which frequently develop. Although the status of relaxation as an effective treatment component remains unclear, certain components have been identified to enhance its effectiveness. These include that it be live (Paul & Trimble, 1970) and presented as an active coping skill (Goldfried & Trier, 1974). Since the progressive relaxation procedure standardized by Bernstein and Borkovec (1973) meets the above requirements, it was selected for use in this study.

Examination of Dush and Konecky's (1982) recent study suggests the rationale for matching treatments with subject variables in the present
study. As noted previously, an interaction was found between initial headache frequency and treatment presentation. The authors additionally noted that subjects receiving cognitive treatment reacted with varying degrees of responsiveness to self-statement modification during group discussion: some appeared to identify and discuss their anxiety-evoking cognitions with ease, whereas others could not. They recommended that investigations of relationships between other features of the migraine sufferer be made in order to further clarify their findings. Following this, subjects in the present study were matched to treatments according to locus of control. This was selected as the individual difference variable of interest based on a hypothesis that it would reflect the differential effects of treatments compared in this study, and because it has a history of interacting with treatments. Although Holroyd et al. (1977) found locus of control unrelated to tension headache improvement as a function of cognitive and biofeedback treatments, other evidence suggests that (a) externals tend to prefer directive therapies, whereas internals tend to prefer nondirective therapies (Kilmann et al., 1975) and (b) externals relate more positively to group behavior therapies than do internals (Friedman & Dies, 1974; Schwartz & Higgins, 1979).

The null hypothesis of the study predicts no differences between groups. The alternative hypotheses follow:

H1: Locus of control will interact with treatments.

Thus, externally-oriented individuals will respond better to the behavioral treatment and internally-oriented individuals will respond better to the cognitive treatment.
H₂: A significant effect for treatments may appear. Thus, one treatment may produce greater reductions in headache symptomatology than the other.

No predictions were made as to which treatment might emerge more effective, should a main effect for treatments appear.

Exploratory analyses will also be conducted to test the following predictions: (1) individuals with initially low headache frequency may respond better to the cognitive treatment than individuals with initially high headache frequency, (2) mean heart rate measure will be lower immediately after relaxation training than it was immediately before for both treatment groups, (3) posttreatment locus of control scores may reflect a shift towards internality and (4) some demographic, headache or subject variables assessed during pretreatment may correlate with treatment effectiveness.
Chapter 2

METHODS

Subjects

Subjects were recruited through public service announcements asking for volunteers for an experimental psychological treatment program for migraine headache sufferers. They were screened in a telephone interview and scheduled for an introductory meeting if they reported having at least one migraine per month and met two of the following four criteria: (1) headaches are predominately one-sided, (2) onset is abrupt or sudden, (3) headaches are usually accompanied by nausea or vomiting or sensitivity to light, and (4) they had received an independent diagnosis by their physician for migraine or vascular headache (see Appendix A). Individuals with combined migraine and tension headache symptoms qualified as long as they met the above criteria. Participants included 20 females and 4 males with a mean age of 40 years and a mean duration of headache symptoms of 23 years. All gave informed consent and obtained clearance from their personal physician to participate in the study.

Seven participants (six females and one male) were eliminated from the study prior to the data analysis (four were from the behavioral group and three were from the cognitive). Two participants from the cognitive group and one from the behavioral group did not complete the program due to schedule conflicts (e.g., too many responsibilities.
due to the holidays and a new job). One participant in the behavioral group dropped out after she developed arthritis in her leg and could not walk. Another participant from the same group simultaneously discontinued since she depended on the former member for transportation to the meetings. Two other participants (one from each group) dropped out after missing the second treatment session due to illness (one was hospitalized). They could not be contacted by telephone for follow-up questioning.

**Measures**

**Symptoms**

For at least 2 weeks prior to receiving treatment, continuing through to a 2 week posttreatment assessment and for 2 weeks at a 6 week follow-up, participants maintained a headache data card on which they rated the occurrence and intensity of their headaches on a 5-point scale (adapted from Blanchard et al., 1978) every hour from 8 A.M. to 12 P.M. An index of overall headache activity was calculated by summing daily headache ratings and computing weekly averages. As shown in Appendix B, the record also permitted quantification of type of headache symptoms (migraine versus tension), presence of associated symptoms (indicated by a check for each identifiable symptom occurring before or during headache), and medication intake.

**Medication Index**

Medications listed by the participants on their data cards were grouped into categories of vasoconstrictors, analgesics, beta-receptor blockers, antidepressants, narcotics, or minor tranquilizers. Because
visual inspection of individual functions representing the total weekly number of tablets or capsules taken for each category revealed no differentiating trends, the total weekly number of tablets or capsules taken was summed across categories to produce a single index of medication intake.

**Process Questionnaire**

Six behaviorally and six cognitively oriented items were devised by the author to measure the extent to which participants reported altering their overt (behavioral items) versus covert (cognitive items) responses in headache-eliciting situations (see Appendix D). Each set of items was designed to reflect types of coping strategies emphasized by each treatment orientation. Subjects completed these measures at both pretreatment and posttreatment assessments.

**Heart Rate Measure**

As a brief index of psychophysiological arousal, participants were requested to take their own pulse (beats per 10 s.) before and after all relaxation sessions conducted in the treatment setting and to record these measures on sheets provided for them in their folders.

**Locus of Control**

Rotter's Internal-External Locus of Control Scale (Rotter, 1966) was administered to subjects at pretreatment and posttreatment assessments. The initial measure was used to match subjects to treatments. It was reassessed after treatment because it was of interest to see whether treatment would produce change in subjects' initial orientation. When Cox, Freundlich, and Meyer (1975) administered locus of control at posttreatment assessment, equally significant shifts toward internality
appeared for subjects receiving EMG feedback and relaxation treatments (as well as placebo medication) for tension headache.

**Program Evaluation Questionnaire**

Subjects were asked to complete a Program Evaluation Questionnaire (see Appendix N) at posttreatment assessment. The first four items assessed experimental demand characteristics; the last four items were included to examine possible nonspecific treatment effects.

**Additional Measures**

A Pain and Health Concerns Questionnaire adapted from McGill's (see Appendix C), Zuckerman and Lubin's Multiple Affect Adjective Checklist (or MAAC; Zuckerman & Lubin, 1966), and Lanyon's Psychological Screening Inventory (or PSI; Lanyon, 1973) were administered at pretreatment assessment. The Pain and Health Concerns Questionnaire obtained descriptive sample information in addition to assessing verbal descriptors of pain. The other measures were included to assess various subject dimensions (e.g., discomfort, depression, expressiveness) so that their impact on headache improvement could be examined.

**Procedure**

Following initial telephone screening, participants met in groups for an introductory meeting where the investigator gave an overview of treatment and client responsibilities, obtained their informed consent and permission to tape record meetings, explained baseline recording procedures and the physician referral requirement, and administered pretreatment questionnaires. A mean was computed for the Locus of Control Scale ($M = 10.5$) and subjects were classified as
either externals or internals based on whether their scores fell above (externals) or below (internals) the mean. They were then randomly assigned to treatment groups following stratification for locus of control. Approximately one day after the introductory meeting, participants were contacted by telephone and informed of their weekly meeting times. A two-week baseline period preceded the beginning of treatment.

Throughout treatment, participants were required to make up missed sessions by listening to a tape recording of the missed session before the next meeting. At the end of the fifth session, participants were instructed to complete the posttreatment questionnaires (i.e., Locus of Control, Process, and Program Evaluation Questionnaires). They were additionally instructed to continue recording headache symptoms for 2 weeks on their data cards, and to mail this information to the author in the self-addressed stamped envelope provided. Participants who did not return their posttreatment data within 3 weeks of the last meeting received a phone call from the author, prompting them to do so. Approximately 6 weeks after the end of posttreatment assessment, participants received a packet in the mail containing 14 recording cards, a self-addressed stamped envelope and instructions to again monitor headache symptoms for 2 weeks and return the information to the author (see Appendix 0).

Treatments

Treatment procedures were administered during five weekly, 1½ hour sessions (with the exception of a two-week break during the
Christmas holidays). The investigator conducted both treatment groups. Although she had previous experience as a cotherapist in treating migraine headaches with cognitive and relaxation procedures in a group format (e.g., Dush & Konecky, 1982), this was her first experience as the primary therapist. Both treatments were conducted in procedurally parallel fashion, but differed primarily with respect to emphasis on altering overt (behavioral focus) versus covert (cognitive focus) headache-eliciting events. Relaxation training, a component of both treatments, was presented during the first half of the third, fourth and fifth treatment sessions for both groups.

**Behavioral Self-Control Plus Relaxation Treatment**

This treatment focused on altering overt behavioral, as well as muscle contraction responses to stressful situations. Specific behavioral self-management strategies were adapted from Mitchell and Mitchell's (1971) and Mitchell and White's (1977) research on migraine headache. Treatment was designed to maximize causal reattribution of symptoms to ineffective behavioral responses in stressful situations or social interactions. Throughout, consistent self-monitoring, application of self-management strategies and self-reinforcement was stressed.

A brief synopsis of migraine psychophysiology was first presented, emphasizing a stress influence on migraine onset. Treatment rationale emphasized that disruptive anxiety and emotional reactions are largely a result of less than optimal behavioral responses to stressful environments or social interactions, and that a person can learn to reduce and eventually eliminate maladaptive stress reactions by identifying anxiety-evoking situations or individuals with whom he/she experiences
stress; then, deliberately changing his/her behavior in a way which is likely to produce effective interactions and therefore be incompatible with stress. Several concrete examples were provided on the variety of ways in which different individuals can respond to the same situation and how the less effective responses can trigger anxiety and migraine attacks.

Following presentation of treatment rationale, participants were encouraged to become more observant of their behavior during periods of stress. To facilitate identification of less than optimal responses, several dimensions of social environmental stimuli, identified by Kiritz and Moos (1974) as influencing physiological processes, were presented and discussed. The therapist also presented specific examples of behaviors that can lead to headache (e.g., making too many commitments, not expressing oneself effectively and setting too high criteria for reinforcement) in the context of a functional analysis. Subjects were encouraged to assist the therapist in specifying the problem in terms of behavioral excesses and/or deficits, identifying antecedents and consequences and setting goals. Group members were then instructed to form a list of stressful situations and to work in turn with the therapist while focusing on identifying (a) the event or person that triggered tension or anxiety, (b) their responses to the stressful situation, (c) the short term and long term consequences of their actions and (d) a reconceptualization of their problem in terms of behavioral excesses and/or deficits. Members were encouraged to learn from others in this analysis and to assist those having difficulty identifying behavioral components of their distress.

After subjects received training in objectively specifying stress-
related behaviors, they were instructed to (a) set long term and short
term goals, (b) develop a recording system for monitoring progress
toward goals, and (c) devise and implement their own strategy for
behavioral self-control. The therapist modeled application of self-
management strategies (see Appendix L) to situations identified as
problematic by group members (e.g., ones reflecting lack of assertive-
ness), and encouraged participants to monitor successful instances of
controlling behavior on a daily basis, to continuously apply self-
reinforcement for small therapeutic gains, and to periodically
review and revise their self-management plan.

Relaxation procedures were modeled after those outlined by Bernstein
and Borkovec (1973). The rationale for relaxation training emphasized
that muscle tension is a learned response and that practice in achieving
progressively deeper levels of relaxation will result in a partial
reduction of migraine symptomatology and in greater ability to effective-
ly manage other aspects of behavior. Participants initially received
training in the tensing and relaxing of 16 muscle groups. As they
learned to relax, the number of muscle groups was reduced to seven
and then relaxation by recall was faded in. Group members were
encouraged to practice the exercises at home on a daily basis for 20
minutes and to report on their successful and unsuccessful attempts.

**Cognitive Coping Plus Relaxation Treatment**

This treatment focused on altering cognitive, as well as, muscle
contraction responses to stressful situations. The cognitive treatment
format closely followed that used by Holroyd and Andrasik (1978). Specific
cognitive strategies were adapted from cognitively-oriented behavior
therapies (Beck, 1970, 1976; Ellis, 1958; Ellis & Gieger, 1977; Goldfried, Denteceo, & Weinberg, 1974; Meichenbaum, 1977). Treatment was designed to maximize causal reattribution of symptoms to dysfunctional cognitions. Throughout, continuous self-monitoring, coping skill application and self-reinforcement was stressed.

Subjects received the same synopsis of migraine psychophysiology, emphasizing a stress influence on headache onset, as the behavioral group. The rationale for the cognitive procedure emphasized that disruptive anxiety and emotional reactions are largely determined by what an individual says to himself/herself about a particular event or situation, and that a person can reduce and eventually eliminate maladaptive stress reactions by becoming aware of anxiety-evoking thoughts and purposely interrupting these before they interfere with adaptive responding. Several concrete examples were provided to illustrate the variety of events that can be perceived as stressful by different individuals and the way in which the respective self-statements can trigger anxiety and migraine attacks.

Following presentation of treatment rationale, participants were encouraged to purposely attend to and identify their self-statements during periods of stress. In order to facilitate self-statement identification, characteristics of anxiety-evoking cognitions and examples of self-statements identified by clinicians as frequently precipitating emotional reactions (e.g., that one must be perfect or liked by everyone) were presented and discussed. Participants practiced phrasing these self-statements in an if/then manner (e.g., if I am not perfect, then I will have failed) so that the consequences reflected by them could be specified and examined objectively. Group
members were then encouraged to form a list of stressful situations and to work in turn with the therapist while focusing on identifying (a) their emotional reactions or responses during stress (e.g., anger, withdrawal, unassertiveness), (b) the cues in the situation that triggered tension and anxiety, (c) their self-statements prior to becoming aware of the tension and while tense, and (d) the way in which these self-statements appeared to contribute to tension and headache. Members were encouraged to learn from others and to assist those having difficulty identifying cognitive components of their distress.

After participants received training in verbalizing anxiety-evoking self-statements, they were instructed to deliberately interrupt this sequence of events at the earliest sign of tension or emotional distress and (a) objectively evaluate the likelihood that they are correctly interpreting the situation (see Appendix M), (b) generate and apply self-statements that are positive and incompatible with the anxiety-evoking cognition, and (c) notice their subsequent decrease in anxiety and behave adaptively. The therapist verbally modeled application of cognitive reevaluation techniques, emphasizing coping over mastery. Subjects were additionally encouraged to review these coping strategies on a daily basis, to apply them at the earliest indication of oncoming headache or emotional reactivity and to administer covert self-reinforcement for small therapeutic gains.

The rationale for relaxation training emphasized that muscle tension is a learned response and that practice in achieving progressively deeper levels of relaxation will result in a partial reduction of migraine symptomatology and in greater ability to effectively
apply cognitive coping techniques. The remainder of the relaxation procedure was identical to that delivered in the behavioral treatment group.

**Experimental Design**

In order to test the predictions of the study, a 2 X 2 factorial analysis of covariance (Treatments X Locus-of-Control Orientations) was utilized, with pretreatment measures as the covariate. Dependent variables included measures of headache activity and medication intake at posttreatment and follow-up assessments. Differences in posttreatment Process Questionnaire scores were also examined. Since past research has consistently indicated the absence of any change occurring among waiting-list control subjects who were self-recording headache symptoms (Mitchell & Mitchell, 1971), no untreated controls were presently used. This allowed for increasing sample size in the two treatment conditions, as well as minimizing the ethical problems of not treating patients with serious disorders (O'Leary & Borkovec, 1978).
Chapter 3

RESULTS

Eleven subjects in the cognitive and six subjects in the behavioral group were included in the posttreatment data analysis. Although subjects were initially assigned to treatment groups randomly, following stratification for locus of control, inspection of Table 1 (differences between completers and noncompleters) reveals that the majority of dropouts were externally-oriented individuals. Thus, the exclusion of seven subjects from the analysis affected the initial equivalence between groups on this factor. Further examination of Table 1 for differences reveals that (a) a higher percentage of noncompleters reported experiencing unilateral plus bilateral head pain than completers, and (b) completers differed on the initial headache frequency variable between groups. Inspection of pretreatment group headache-activity means in Table 2, corroborates the latter observation. The above observations (differential dropout rate and unequal distribution of one independent and one dependent variable between groups) indicate that subjects' pretreatment scores need to be taken into consideration during the analysis. For this reason, analysis of covariance (with pretreatment scores as the covariate) was used to provide the most accurate assessment of treatment effects.
Table 1

Differences Between Completers and Noncompleters Assigned to Behavioral and Cognitive Treatment Groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>Completers</th>
<th></th>
<th>Noncompleters</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of subjects</td>
<td>6</td>
<td>11</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Reporting unilateral plus bilateral head pain</td>
<td>17%</td>
<td>36%</td>
<td>75%</td>
<td>66%</td>
</tr>
<tr>
<td>Having initially high headache frequency</td>
<td>33%</td>
<td>60%</td>
<td>25%</td>
<td>66%</td>
</tr>
<tr>
<td>Classified as externals</td>
<td>33%</td>
<td>46%</td>
<td>75%</td>
<td>66%</td>
</tr>
<tr>
<td>Positive family history for migraine</td>
<td>100%</td>
<td>64%</td>
<td>50%</td>
<td>66%</td>
</tr>
<tr>
<td>Mean age</td>
<td>46</td>
<td>37</td>
<td>45</td>
<td>35</td>
</tr>
<tr>
<td>Mean years of experiencing migraines</td>
<td>29.3</td>
<td>21</td>
<td>24.5</td>
<td>15.7</td>
</tr>
<tr>
<td>Mean # doctors consulted for head pain</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Mean years working at latest job</td>
<td>11.6</td>
<td>6</td>
<td>13.7</td>
<td>2</td>
</tr>
<tr>
<td>Highest level of education:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school</td>
<td>33%</td>
<td>27%</td>
<td>25%</td>
<td>0%</td>
</tr>
<tr>
<td>College</td>
<td>66%</td>
<td>46%</td>
<td>75%</td>
<td>100%</td>
</tr>
<tr>
<td>Beyond college</td>
<td>0%</td>
<td>27%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Marital status:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>0%</td>
<td>27%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Married</td>
<td>83%</td>
<td>73%</td>
<td>75%</td>
<td>66%</td>
</tr>
<tr>
<td>Divorced</td>
<td>17%</td>
<td>0%</td>
<td>25%</td>
<td>33%</td>
</tr>
<tr>
<td>Females</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean # children</td>
<td>3.5</td>
<td>2.5</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>
### Table 2

Means of Pretreatment, Posttreatment and Some Follow-up Measures for Major and Minor Dependent Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Behavioral Group</th>
<th>Cognitive Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group</td>
<td>Group</td>
</tr>
<tr>
<td></td>
<td>Pre:</td>
<td>Post:</td>
</tr>
<tr>
<td>Headache Activity^a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>11.3 (n = 5)</td>
<td>15.3 (n = 10)</td>
</tr>
<tr>
<td>Post</td>
<td>12.85 (&quot; )</td>
<td>16.8 (&quot; )</td>
</tr>
<tr>
<td>Follow-up</td>
<td>21.5 (n = 3)</td>
<td>12.47 (n = 8)</td>
</tr>
<tr>
<td>Medication Intake^b</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>14.0 (n = 5)</td>
<td>13.1 (n = 10)</td>
</tr>
<tr>
<td>Post</td>
<td>8.2 (&quot; )</td>
<td>13.6 (&quot; )</td>
</tr>
<tr>
<td>Follow-up</td>
<td>6.5 (n = 3)</td>
<td>9.7 (n = 8)</td>
</tr>
<tr>
<td>Process Questionnaire Scores^c</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre: Behaviorally-oriented</td>
<td>2.5 (n = 6)</td>
<td>2.7 (n = 11)</td>
</tr>
<tr>
<td>Cognitively-oriented</td>
<td>2.6 (&quot; )</td>
<td>2.6 (&quot; )</td>
</tr>
<tr>
<td>Post: Behaviorally-oriented</td>
<td>2.9 (&quot; )</td>
<td>3.15 (&quot; )</td>
</tr>
<tr>
<td>Cognitively-oriented</td>
<td>3.1 (&quot; )</td>
<td>3.16 (&quot; )</td>
</tr>
<tr>
<td>Heart Rate Measure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-relaxation</td>
<td>13.9 (&quot; )</td>
<td>13.9 (&quot; )</td>
</tr>
<tr>
<td>Post-relaxation</td>
<td>12.3 (&quot; )</td>
<td>12.3 (&quot; )</td>
</tr>
<tr>
<td>Locus of Control Scores^d</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre: Internals</td>
<td>8.0 (n = 4)</td>
<td>7.3 (n = 6)</td>
</tr>
<tr>
<td>Externals</td>
<td>12.5 (n = 2)</td>
<td>12.5 (n = 5)</td>
</tr>
<tr>
<td>Post: Internals</td>
<td>6.8 (n = 4)</td>
<td>6.5 (n = 6)</td>
</tr>
<tr>
<td>Externals</td>
<td>13.8 (n = 2)</td>
<td>10.6 (n = 5)</td>
</tr>
</tbody>
</table>

^a Weekly average of daily totals  
^b Weekly total  
^c Higher scores reflect more frequent application of coping strategies.  
^d Scores over 10.5 reflect external locus-of-control orientation.
Analysis of Treatment Effects

Posttreatment Symptom Measures

Posttreatment headache activity and medication intake were submitted to a 2 X 2 factorial analysis of covariance (Treatments X Locus of Control Orientations) in order to test the hypotheses of the study. No significant interactions or main effects emerged for either measure (see Table 3). However, the experimental design of the study did not allow for assessment of treatment effects, should changes in measures occur in a similar direction and magnitude across all conditions. To examine this possibility, mean daily headache activity and weekly medication intake, monitored throughout the study, were plotted for individuals and for treatment groups and visually inspected for changes (see Figures 1 & 2 for graphs of group averages on both measures). Graphs revealed highly variable data with much overlap between conditions and few or inconsistent trends. Because little or no improvement was indicated, further analyses on these measures did not seem warranted and were not conducted.

A number of additional, post hoc examinations of the data were made. Plots of daily headache activity for externally and internally oriented groups of individuals (see Figures 3 & 4) were inspected and revealed an interesting pattern: for both treatment conditions, the functions representing the external group contain an increasing trend in headache activity over the Christmas holidays, whereas the functions representing the internal group are variable, but lack this trend.

The number of daily additional symptoms participants reported experiencing before or during their headache was additionally plotted
### Table 3

Analysis of Covariance for Major Dependent Variables at Posttreatment Assessment

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Source</th>
<th>df</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headache Activity</td>
<td>Covariate&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1</td>
<td>2132.979</td>
<td>40.124</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Treatments</td>
<td>1</td>
<td>5.384</td>
<td>.101</td>
<td>.757</td>
</tr>
<tr>
<td></td>
<td>Locus of Control</td>
<td>1</td>
<td>71.750</td>
<td>1.350</td>
<td>.272</td>
</tr>
<tr>
<td></td>
<td>Interaction</td>
<td>1</td>
<td>75.136</td>
<td>1.413</td>
<td>.262</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>10</td>
<td>53.160</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medication Intake</td>
<td>Covariate&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1</td>
<td>4819.485</td>
<td>353.219</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Treatment</td>
<td>1</td>
<td>6.001</td>
<td>.441</td>
<td>.592</td>
</tr>
<tr>
<td></td>
<td>Locus of Control</td>
<td>1</td>
<td>11.105</td>
<td>.814</td>
<td>.528</td>
</tr>
<tr>
<td></td>
<td>Interaction</td>
<td>1</td>
<td>5.231</td>
<td>.383</td>
<td>.555</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>10</td>
<td>13.644</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Pretreatment headache activity  
<sup>b</sup> Pretreatment medication intake
Figure 1. Mean daily headache activity for behavioral and cognitive group participants completing posttreatment and follow-up assessments.

Data of subjects completing posttreatment follow-up (N=3 above; N=6 below)

Data of subjects completing posttreatment (N=5 above; N=10 below)

Mean headache activity for cognitive group

Mean headache activity for behavioral group
Figure 2. Mean weekly medication intake for behavioral and cognitive group participants completing posttreatment and follow-up assessments.
Figure 3. Mean daily headache activity for internally and externally oriented individuals in the cognitive group. Days 35 through 49 represent the week of Christmas.
Figure 4. Mean daily headache activity for internally and externally oriented individuals in the behavioral group. Days 35 through 49 represent the week of Christmas.
on individual graphs of daily headache activity, in order to examine the correspondence between the two measures. Generally, increases and decreases in the symptom measure corresponded with respective fluctuations in headache activity.

**Follow-up Symptom Measures**

Eight subjects in the cognitive and three subjects in the behavioral group were included in the follow-up data analysis. Due to the attrition of six subjects and the lack of consequence in earlier analyses, the locus of control factor was dropped from the experimental design in order to add power to the test. A one-way factorial analysis of covariance on follow-up headache activity (with pretreatment headache activity as the covariate) revealed a significant main effect for treatments \(F(1, 10) = 5.45, p < .05; \) Table 4). To further examine this effect, mean daily headache activity was replotted for individuals in both treatment groups across baseline through follow-up conditions using the data of only those subjects responding to follow-up assessment (see Figure 1). Inspection of functions for the follow-up condition indicated that headache activity was more variable for the behavioral group than it was for the cognitive. Calculation of an \(F\) statistic based on the variance of follow-up headache activity scores for both groups corroborates this observation by revealing that the greater variability in follow-up headache activity for the behavioral group was significant \(F(13, 13) = 7.05; p < .01\). While this suggests a more favorable impact for the cognitive treatment presentation over the behavioral, the presence of a 3½-week cyclic trend in the headache activity plot of behavioral-group participants completing follow-up
Table 4

Analysis of Covariance for Major Dependent Variables at Follow-up Assessment

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Source</th>
<th>df</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Headache</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Activity</td>
<td>Covariate&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1</td>
<td>2019.377</td>
<td>186.968</td>
</tr>
<tr>
<td></td>
<td>Treatment</td>
<td>1</td>
<td>58.924</td>
<td>5.456</td>
<td>.048</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>8</td>
<td>10.801</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medication</td>
<td>Covariate&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1</td>
<td>7.383</td>
<td>21.675</td>
</tr>
<tr>
<td></td>
<td>Intake</td>
<td>Treatment</td>
<td>1</td>
<td>.213</td>
<td>.624</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Error</td>
<td>8</td>
<td>.341</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Pretreatment headache activity
<sup>b</sup> Pretreatment medication intake
(see Figure 1) complicates the interpretation of results. Speculations regarding these should also be guarded since the data of only three behavioral-group participants was included in follow-up analyses.

A one-way factorial analysis of covariance on follow-up medication intake yielded no significant effect for treatments. Inspection of Figure 2 (which contains separate plots of medication intake for subjects responding to posttreatment and follow-up assessments) corroborates this by revealing no improvement in follow-up medication intake from baseline for either treatment group.

Process Questionnaire Scores

Posttreatment scores for behaviorally and cognitively oriented items on the Process Questionnaire were submitted to a 2 X 2 analysis of covariance (Treatments X Locus of Control Orientation) and revealed no significant main effects or interactions (Table 5). However, post hoc inspection of individual scores, as well as group means (see Table 2), indicated that scores for both sets of items did increase at posttreatment assessment. After a conservative correction for alpha slippage utilizing Dunn’s Procedure (α.05 = .014, α.01 = .003), t-tests for correlated means on behaviorally and cognitively oriented items revealed that both effects were significant (p < .01 and p < .05, respectively). That the analysis of covariance revealed no differences in sets of scores between groups, whereas t-tests revealed significant increases in both sets of scores, establishes that both groups of participants reported an increase in their application of both types of coping strategies, irrespective of what type of treatment they received. This indicates that (a) treatments produced change in the
### Table 5
Analysis of Covariance on Behaviorally and Cognitively Oriented Items of the Process Questionnaire

<table>
<thead>
<tr>
<th>Orientation of Items</th>
<th>Source</th>
<th>df</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioral Covariate</td>
<td>1</td>
<td>.169</td>
<td>.609</td>
<td>.450</td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td>1</td>
<td>.069</td>
<td>.248</td>
<td>.627</td>
<td></td>
</tr>
<tr>
<td>Locus of Control</td>
<td>1</td>
<td>.003</td>
<td>.010</td>
<td>.922</td>
<td></td>
</tr>
<tr>
<td>Interaction</td>
<td>1</td>
<td>.407</td>
<td>1.464</td>
<td>.250</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>12</td>
<td>.273</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive Covariate</td>
<td>1</td>
<td>1.633</td>
<td>4.364</td>
<td>.059</td>
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*a* Pretreatment behaviorally-oriented process questionnaire scores  
*b* Pretreatment cognitively-oriented process questionnaire scores
application of coping strategies for which they were designed and that (b) treatment effects generalized to produce change in application of coping strategies emphasized by the other treatment orientation.

Exploratory Analyses

Program Evaluation Questionnaire

In order to more fully investigate the nature of coping strategies acquired, two questions relating to coping strategy acquisition on the Program Evaluation Questionnaire were examined: (1) what parts of the program did you feel were the most useful, and (2) what strategies have you learned to use to control your headaches as a function of the program. While a high percentage of participants from both treatment groups reported utilizing relaxation techniques (100% and 90%, respectively), only 16% of participants (one person) in the behavioral group reported using strategies specifically related to their treatment orientation (e.g., deliberately attempting to change unassertive behavior), in contrast to 90% of participants in the cognitive group (who reported using some form of cognitive reevaluation) (see Figure 5). Thus, participants in the cognitive group reported learning more strategies for controlling headache as a function of treatment than did participants in the behavioral group. Note that these results are inconsistent with implications drawn from the Process Questionnaire.

The first four items of the Program Evaluation Questionnaire were designed to be sensitive to credibility and demand characteristics of treatments (see Appendix N). To assess whether groups differed in their responses to these, each item was submitted to a one-way
Figure 5. Per cent of individuals reporting usefulness of strategies for headache as a function of cognitive and behavioral treatments.
analysis of variance. No significant differences with even liberal criteria between groups emerged on any item (see Table 6).

**Heart Rate Measure**

A *t*-test for correlated means on the heart rate measure revealed significant decreases in heart rate at post-relaxation assessments for both treatment groups (*p* < .05). Although this measure (self-reports of heartbeats per 10 s.) was a very rough index of physiological responding, it does indicate that the relaxation training effected both groups similarly within the treatment setting.

**Initial Headache Frequency Parameter**

To examine whether initial headache frequency would reflect differential treatment effects (as recommended by Dush & Konecky, 1982), subjects were grouped on the basis of their baseline activity scores into two groups: (1) those who experienced less than 6 days of headache during the 2 week baseline and (2) those who experienced between 6 and 14 days of headache during the 2 weeks. A 2 X 2 repeated measures analysis of covariance (Treatments X Initial Headache Frequency) on post-treatment headache activity revealed no significant effects (see Table 7).

**Posttreatment Locus of Control Scores**

This analysis examined the extent to which locus of control scores changed as a function of treatment. A *t*-test for correlated means on pretreatment scores revealed no significant effects (*p* > .05). Although post hoc inspection of individual treatment scores revealed no more than a three digit change in either direction from initial
Table 6
Analysis of Variance on Items of the Program Evaluation Questionnaire

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Table 7
Repeted Measures Analysis of Covariance
(Initial Headache Frequency X Treatment)

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</table>

\(^a\) Pretreatment headache activity
scores for 87% of the participants, it is interesting to note that
scores for the remaining two participants (both from the cognitive
group) reflected a shift towards internality by a change of seven
and eleven digits.

Additional Measures

A partial correlational analysis, which adjusted for differences
in pretreatment headache activity, was additionally conducted between
headache activity outcome and a variety of demographic, headache and
subject variables (as measured by the Pain and Health Concerns Ques-
tionnaire, MAAC, and PSI). Significant correlations emerged between
posttreatment headache activity and the following seven variables:
pain pattern ($p < .01$); pain location ($p < .05$); the PRI(R)Evaluative,
PRI(R)Sensory, and TWC-Evaluative subclasses of Melzack's Pain Ques-
tionnaire (all $p < .05$; see Melzack, 1975, for scoring procedures);
and the Discomfort and Random-Responding scales of Lanyon's PSI
($p < .01$ and $p < .05$, respectively). Categories of these variables
predicting favorable response to treatment included: (a) a rhythmic,
periodic and intermittent pain pattern, (b) unilateral pain location,
(c) low scores on the PRI(R)Evaluative, TWC-Evaluative, and PSI
Random-Responding scales, and (d) high scores on the PRI(R)Sensory
and PSI Discomfort scales. Categories predicting less favorable
treatment response included (a) a continuous, steady and constant
pain pattern, (b) bilateral pain location, (c) high scores on the
PRI(R)Evaluative, TWC-Evaluative, and PSI Random-Responding scales,
and (d) low scores on the PRI(R)Sensory and PSI Discomfort scales.
Only three variables emerged as significantly correlated with head-
ache activity at follow-up: pain pattern ($p < .000$); the TWC-Evaluative subclass of Melzack's Pain Questionnaire ($p < .000$), and years of schooling ($p < .05$). It is interesting to note that 93% of follow-up participants reported a continuous, steady and constant pain pattern and that all follow-up participants scored the same (i.e., received a rating of 1) on the TWC-Evaluative scale. No significant correlations emerged between any demographic variables (other than years of schooling), other scales of Lanyon's PSI, other subclasses of Melzack's Pain Questionnaire, initial headache frequency, locus of control or any scales of the MAAC (i.e., depression, anxiety, or hostility).
Chapter 4

DISCUSSION

The present study was designed to extend research on migraine by (1) comparing the effectiveness of behavioral and cognitive treatments for migraine, and (2) investigating the usefulness of locus of control as a predictor of differential treatment effects. Various headache and subject variables were also examined in the latter context. In general, results did not convincingly support differential treatment efficacy. They also did not reveal an effect for the locus of control interaction with treatments. Exploratory analyses conducted on additional measures revealed that certain headache and subject variables correlated with treatment outcome. Results for these will be discussed further.

While a differential effect emerged for treatments in follow-up headache activity favoring the cognitive treatment presentation over the behavioral, it is not clear which variables contributed to this outcome. Moreover, the high attrition seriously questions the validity of the follow-up data. Results from the Process Questionnaire revealed that participants from both groups reported significantly increased application of both cognitive and behaviorally-oriented coping strategies in headache-eliciting situations, but not differentially. In contrast to this, post hoc examination of two open-ended questions on the Program Evaluation Questionnaire (i.e., Numbers 1 & 3 in the 2nd set of questions; see Appendix N) revealed that substantially more cognitive-group than behavioral group participants reported applying coping
strategies to control headache that were related to the treatment orientation they received. These self-report measures, however, provide no direct evidence indicating whether or not group participants acquired intended coping techniques. For this reason, and because interpretation of follow-up results is complicated by differential attrition and the presence of the 3½-week cyclic trend in the headache activity of behavioral-group participants completing follow-up (described previously on p. 38; also see Figure 1), follow-up results do not warrant specific conclusions regarding the greater effectiveness of cognitive or behavioral treatments for migraine. They do, however, suggest that the cognitive versus behavioral treatment distinction merits further investigation in migraine research. More rigorous assessment of coping strategy acquisition, as well as coping strategy application, is additionally needed.

The following headache and subject variables correlated with posttreatment headache activity: pain pattern, pain location, scores on the TWC-Evaluative, PRI(R)Evaluative and PRI(R)Sensory subclasses of Melzack's Pain Questionnaire and scores on the Random-Responding and Discomfort scales of Lanyon's PSI. Only pain pattern and scores on the TWC-Evaluative subclass of Melzack's Pain Questionnaire remained correlated with symptom outcome at follow-up, however, the effect for pain pattern was highly significant at both assessments: a continuous, steady and constant pain pattern was associated with less effective treatment response, whereas a rhythmic, periodic and intermittent pain pattern was associated with more effective treatment response. Thus, pain pattern appears useful in predicting responsiveness to treatment.

Implications regarding the predictive utility of the TWC-Evaluative
measure are not clear since all participants completing follow-up received the same score. Implications involving the predictive utility of pain location and headache frequency are additionally not clear. Dush and Konecky's study (1982) supported present findings that treatment response is predictable by pain location, while a recent cognitive plus relaxation treatment for chronic headache (Bakal, Demjen & Kaganov, 1981) found that symptom improvement was not related to pain location (or headache type). The latter authors' data are especially salient since pain location was more rigorously assessed. Both Dush and Konecky (1981) and Bakal et al. (1981) found a strong effect for initial headache frequency in predicting treatment response, but no effect was found in the present study. Another variable, years of schooling, correlated with present outcome at follow-up, but only marginally. Due to the inconsistent and/or marginal correlations obtained, the reliability of effects involving subject and headache variables requires further study.

Group (see Figure 1) and individual plots of daily headache activity suggested that neither the behavioral nor cognitive treatment substantially reduced migraine symptoms at either posttreatment or follow-up assessment. Locus of control also appeared to be unrelated to symptom outcome, although its usefulness as a predictor of treatment responsiveness would be more adequately examined amidst treatments producing stronger overall effects. The appearance of an increasing trend in headache activity for externally-oriented individuals over the Christmas holidays does suggest that the headache activity of externals may be more easily affected by changes in the external environment.
than the headache activity of internals. Continued investigation of locus of control in migraine research is indicated.

A number of limitations of the present study need to be kept in mind. One concerns the nature of the symptom recordings. Since pain is a subjective phenomenon, its measurement was self-reported and reliability was not assessed. However, attempts were made to improve the method of pain assessment. For example, the pain rating scale utilized in the present study (see Appendix B) was selected primarily because it provided participants with somewhat objective verbal criteria upon which to base their rating of pain experiences. This increases the likelihood that participants would consistently utilize the same criteria for evaluating and reporting their pain. In a recent review of migraine assessment and treatment, Blanchard and Andrasik (1982) briefly described a study which investigated the "social validation" of the headache diary by "significant others" and concluded that results "help justify the continued use of the headache diary in clinical research" (p. 864). The number of additional symptoms participants recorded as accompanying or preceding headache generally corresponded with daily fluctuations in headache activity, providing some support to the validity of the present self-reports. However, it is likely that some participants made changes in their self-recordings after the first treatment session, where a number of questions regarding recording procedures were clarified. This suggests that baseline recordings of symptom measures may have differed from later recordings. The 3-week cyclic trend appearing in the plot of headache activity for behavioral-group participants completing follow-up additionally suggests that the
baseline condition needs to be extended in order to minimize contamination of results by trends.

Two anecdotal observations additionally bear mentioning. The first concerns the difficulty that behavioral-group participants had in providing detailed descriptions of daily routine and problems experienced during headache. Since participants did volunteer these descriptions on occasion, when interacting with the therapist individually, it is the author's belief that certain aspects of the large group inhibited detailed descriptions of headache-related events. This suggests that behavioral treatments similar to the present study's may progress more optimally on an individual, or very small group, level. That the migraine sufferer may require greater therapeutic assistance for target-behavior identification is additionally implicated by Mitchell and Mitchell's (1971) postulation that headache-related behaviors, "though idiosyncratically inflexible, and hence maladaptive, are not necessarily maladaptive in terms of behavioral and cultural norms" (p. 151). The second observation concerns the effects of the relaxation procedure. Participants appeared better able to discern antecedent stressful situations to headache after receiving relaxation training and instructions to apply it at the onset of perceived muscle tension. Thus, implementing relaxation training at the start of treatment (versus mid-course) would seem to facilitate progress in self-control procedures aimed toward altering responses or reactions to environmental stress.

In summary, the first hypothesis of the study, that locus of control would interact with treatments, was not supported nor adequately investigated due to failure of treatments to produce
strong overall effects. The second hypothesis, that one procedure may be more effective in treating migraine than the other, was also not supported except in follow-up data which was seriously limited by excessive attrition. Cognitive-group participants did report a substantially greater amount of treatment-related coping-strategy application than did participants in the behavioral group. Although the pain-pattern headache variable appears useful in reflecting differential treatment response, implications regarding the predictive utility of the other headache and subject variables which correlated with treatment outcome are not clear.
REFERENCES


APPENDIX A

TELEPHONE SCREENING
Hello. This is __________, one of the researchers for the study. Before I tell you about the program, I was wondering if you would mind first answering a few questions about your headaches?

(If don't mind ask):

1. How did you find out that your headaches were migraine?
2. About how often do you have migraines?
3. Do you have other symptoms such as nausea or vomiting occurring with your headaches?
4. Do you get pain on one or on both sides of your head?
5. Does anyone else in your family have migraines?

(If the answer to Question #2 is at least once per week and if at least two of the remaining four responses were characteristic of migraine, rather than tension headache; include them in the study and say): This study will focus on teaching progressive muscle relaxation and stress management techniques for dealing with migraine. There will be a total of five classes that will meet once a week - each will last one hour and a half. It will be important for you to attend all meetings since this is a research project. There will also be an introductory meeting that will be held next week on either Monday or Tuesday night at 6:30. Are you interested in participating? Which night of the week is most convenient for you? Can I have your name and phone number please? We will also be asking you to get permission from your family physician to participate in the study, but you won't have to worry about that until after the introductory meeting. Do you have any questions? Meetings will be held in room 203 in Meredith Hall on the Drake University campus. Do you know where that is? (If no, tell them.) See you next Monday (or Tuesday).
Thank you for calling.

(If respondents do not qualify for the study say): This particular study was designed for people who have migraines at least once per month. How often headaches occur is important because of the times during which meetings were scheduled. We have just started to do research on migraines and plan to continue with studies in the future. If you would be interested in leaving your name and phone number, we could call you if a study designed for your particular type of headache symptoms comes up. (Take name and phone #.) Thankyou for your interest.
APPENDIX B

HEADACHE DATA CARD
HEADACHE DATA CARD

NAME ___________________________ DATE ___________________________

TOTAL HEADACHE INTENSITY ______

HEADACHE RATING SCALE:

1= Only aware of headache when attention is devoted to it.
2= Mild headache, can be ignored at times.
3= Headache painful, but person can still do his job.
4= Very severe headache, difficult to concentrate, can do only undemanding tasks.
5= Excruciating, incapacitating headache pain.

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<th>Medication</th>
<th>Symptoms</th>
<th>Time</th>
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APPENDIX C

PAIN AND HEALTH CONCERNS QUESTIONNAIRE
PAIN AND HEALTH CONCERNS QUESTIONNAIRE *

INSTRUCTIONS: The following questions are designed to provide information which can help us serve you in a better way. Most of the information will be in the form of simple listings. We would appreciate the 10 or 15 minutes you take to complete it.

I. Background Information

Date __________________________ Name __________________________ Age ______ Sex ______

Address __________________________________________________________ Zip __________

Marital Status ______ If married, how long? __________________________

If divorced or widow/widower, how long? ______ How many children? ______

Years of schooling ______ Occupation __________________________

Number of years at latest job __________________________

Living arrangements (apartment, own home, etc.) __________________________

Please list persons you're living with and their relationship with you:

II. Present Problem Information

1. Does anyone in your family have a history of migraine headache? ______

   If so, which members? __________________________

2. Please underline any of the following concerns that apply to you:

   Family concerns
   Martial stress
   Problems at school
   Health concerns
   Financial strain
   Legal problems
   Sad or depressed
   Loss of appetite
   Not eating right food
   Loss or gain of weight
   Loss of sleep
   Not enough exercise
   Low energy
   Difficulty concentrating
   Quick change of moods
   Panicky
   Shaky/trembling
   Nausea/vomiting

   Withdrawing from people
   Feeling inadequate
   Lack of enjoyed activities
   Too much medication
   Too much alcohol
   Feeling pessimistic
   Difficulty making friends
   Stress in relationship(s)
   Feeling lonely
   Sexual difficulties
   More energy than usual
   Very talkative
   Restless
   Nervous/tense
   Preoccupied with problems
   Diarrhea/constipation
   Swelling of hands or face
   Visual changes such as blind spots, light sensitivity or seeing stars

   Upset stomach
   Sweating
   Light headedness/dizziness
   Too busy/little recreation
   Too much worry
   Too many fears
   Feeling guilty
   Feeling angry/frustrated
   Nightmares
   Need attention
   Too much pain
   Confused
   Disorganized
   Laugh w/out reason
   Memory problems
   See/hear strange things
   Feeling used by people
   Feeling others out to get you

* Adapted from the BHS Health Concerns Questionnaire (Pain) of Iowa Lutheran Hospital, Des Moines, Iowa.
3. In front of the concerns you just underlined, please rate the severity of your concern as:

1=mildly distressing, 2=moderately distressing, 3=seriously distressing
4=severely distressing, 5=very severely distressing

III. Pain Description

Some of the following words describe your present pain. Circle the one word in each group that best describes it. Mark only one word in each group. Skip the groups that do not apply.

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<th>2.</th>
<th>3.</th>
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<td>Jumping</td>
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<td>Sharp</td>
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<td>Flashing</td>
<td>Boring</td>
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IV. Pain Intensity

The following phrases represent pain of increasing intensity:

1 = mildly distressing
2 = moderately distressing
3 = seriously distressing
4 = severely distressing
5 = very severely distressing

Using the above scale, write the number of the phrase that best describes each of the following:

- _____ Your pain right now.
- _____ Your pain as it usually feels.
- _____ Your pain at its worst.
- _____ Your pain at its least.
- _____ Your usual pain in the morning.
- _____ Your usual pain in the afternoon.
- _____ Your usual pain in the evening.
- _____ Your usual pain at night.
- _____ The worst headache you ever had.
- _____ The worst stomach-ache you ever had.
- _____ The worst sunburn you ever had.
- _____ The worst insect bite you ever had.

V. Pain Pattern

1. * Check the word group that best describes your pain:

- _____ Continuous, steady, constant
- _____ Rhythmic, periodic, intermittent
- _____ Brief, momentary, transient

2. The following is a list of situations and activities which can worsen pain. Please underline all the situations or activities which worsen your pain; then place a "1" beside the item which worsens it the most, a "2" beside the item which worsens it the next most, and so on.

- Heat
- Cold
- Damp
- Weather changes
- Pressure
- Movement
- No movement
- Standing
- Sitting
- Driving
- Urination/BM's
- Late in day
- Early in day

- Tension
- Bright lights
- Loud noises
- Going to work
- Sexual relations
- Mild exercise
- Coughing/sneezing
- Others that you can think of:

- ____________________________
- ____________________________
3. The following is a list of situations and activities which can relieve pain. Please underline all of those that relieve your pain; then place a "1" beside the item which relieves it the most, a "2" beside the item which relieves it the next most, and so on.

<table>
<thead>
<tr>
<th>Heat</th>
<th>Lying down</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cold</td>
<td>Sleep/rest</td>
</tr>
<tr>
<td>Pressure</td>
<td>Distraction (e.g., TV, read, visit)</td>
</tr>
<tr>
<td>Massage/vibrator</td>
<td>Going to work</td>
</tr>
<tr>
<td>Liquor</td>
<td>Sexual relations</td>
</tr>
<tr>
<td>Coffee/tea</td>
<td>Mild exercise</td>
</tr>
<tr>
<td>Eating</td>
<td>Others you can think of:</td>
</tr>
<tr>
<td>Movement</td>
<td></td>
</tr>
<tr>
<td>No movement</td>
<td></td>
</tr>
<tr>
<td>Sitting</td>
<td></td>
</tr>
</tbody>
</table>

4. Please underline each of the following activities with which your pain interferes:

- Appetite
- Hobbies
- Eating
- Recreation
- Sleeping
- Sexual relations
- Urination/BM's
- Exercise
- Work on the job
- Others:
- Work at home
- Social contacts
- Others you can think of:

V. Pain Origin

1. When did you first experience the pain for which you are now seeking help?

2. Check the circumstances under which the pain began.

- Accident at work
- Following surgery
- Accident at home
- Following illness
- Other accident
- Just began
- Other accident but not an accident
- Other (explain):
- At work but not an accident
- Describe circumstances:

3. In what part(s) of your body did the pain first begin?

1. 
2. 
3. 

4. What part(s) of your body now hurt when you experience pain?

1. 
2. 
3. 


5. If your pain has changed for better or worse since it first began, what caused the change(s)?

1. 
2. 
3. 

VII. Pain Treatment

1. Please underline any of the following treatments you have received for your pain. Place an "R" beside the ones that brought you relief; then indicate how long the relief lasted.

<table>
<thead>
<tr>
<th>Medication</th>
<th>TENS Unit</th>
<th>Others:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgery</td>
<td>Acupuncture</td>
<td></td>
</tr>
<tr>
<td>Nerve Blocks</td>
<td>Behavior Therapy</td>
<td></td>
</tr>
<tr>
<td>Hypnosis</td>
<td>Biofeedback</td>
<td></td>
</tr>
</tbody>
</table>

2. Choosing one or two types of treatment that brought you the most relief, please indicate when and under what circumstances the treatment occurred.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>When</th>
<th>Circumstances</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

3. * What medicines are you now taking for pain?

<table>
<thead>
<tr>
<th>Name</th>
<th>Dose</th>
<th>How often</th>
<th>illness/problem</th>
<th>Date started</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

Comments, side effects:

4. * What other medicines are you now taking?

<table>
<thead>
<tr>
<th>Name</th>
<th>Dose</th>
<th>How often</th>
<th>illness/problem</th>
<th>Date started</th>
</tr>
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</tbody>
</table>
5. * Since your pain condition began, check each of the following people you have consulted for treatment and pain relief:

- Acupuncturist
- Allergist
- Anesthesiologist
- Cardiologist (heart)
- Chiropractor
- Dentist
- Dermatologist (skin)
- Ear, nose, throat doctor
- Endocrinologist (glands)
- Faith healer
- General practice/Family practice
- Gynecologist/Obstetrician
- Hypnotist
- Internist (internal medicine)
- Minister/Priest/Rabbi
- Neurologist (nervous system)
- Neurosurgeon
- Orthopedist (bones/joints)
- Osteopath
- Pediatrician (children)
- Plastic surgeon
- Podiatrist (foot)
- Proctologist
- Psychiatrist
- Psychologist
- Radiologist
- Surgeon (general)
- Urologist
- Other

III. Pain Concepts

** In order to help us fully understand how pain affects you, we'd like you to think of a recent incident when pain was particularly bad. Close your eyes for a moment and picture that situation. Relive in your mind that incident. "Tune in" to the thoughts, images and feelings you have in this situation, in as much detail as possible. Please describe:

1. What went through your mind when you first noticed the pain?

2. As you tried to cope with the pain, what were you thinking?

3. Do you notice a common theme or link running through these thoughts? If so, what is it?

4. When you imagine what your pain is like, what common object or thing would you compare it to?

* Adapted from the University of Iowa Pain Questionnaire
** Adapted from D. Turk's Pain Questionnaire
IX. Pain Location

Outline the areas of your upper body where you feel pain on the drawings below. Then, please use the following rating scale to label the intensity of your pain in each area:

4 = excruciating pain
3 = severe pain
2 = moderate pain
1 = mild pain
APPENDIX D

PROCESS QUESTIONNAIRE
DIRECTIONS: Please circle the one answer that best applies to you for each of the items listed below.

1. Whenever I notice a headache coming on, I take time to stop and evaluate how I am interpreting my surrounding circumstances.
   (a) never, (b) once in a while, (c) about half of the time, (d) most of the time, (e) all of the time

2. I am able to identify my particular behavior or actions in certain situations that contribute to my headache.
   (a) never, (b) once in a while, (c) about half of the time, (d) most of the time

3. I set goals for myself to use in stressful situations which encourage me to act in specific ways that are incompatible with stress.
   (a) never, (b) once in a while, (c) about half of the time, (d) most of the time, (e) all of the time

4. I feel that I have good control over my emotions in stressful situations.
   (a) never, (b) once in a while, (c) about half of the time, (d) most of the time, (e) all of the time

5. I am able to identify one or more specific thoughts or worries that contribute to my headache.
   (a) never, (b) once in a while, (c) about half of the time, (d) most of the time, (e) all of the time

6. I am aware of how the things I say to myself influence my reactions to stress.
   (a) never, (b) once in a while, (c) about half of the time, (d) most of the time, (e) all of the time

7. I feel that I have good control over my behavior in stressful situations.
   (a) never, (b) once in a while, (c) about half of the time, (d) most of the time, (e) all of the time

8. Whenever I notice a headache coming on, I act differently now than how I did 3 months ago.
   (a) never, (b) once in a while, (c) about half of the time, (d) most of the time, (e) all of the time

9. Whenever I notice a headache coming on, I attempt to change my behavior so that I am interacting more effectively with my surrounding environment.
   (a) never, (b) once in a while, (c) about half of the time, (d) most of the time, (e) all of the time
10. I attempt to change my attitude during stressful situations by thinking in a more positive manner.
   (a) never, (b) once in a while, (c) about half of the time, (d) most of the time, (e) all of the time

11. I am aware of how my behavior effects my level of tension and anxiety.
   (a) never, (b) once in a while, (c) about half of the time, (d) most of the time, (e) all of the time

12. Whenever I notice a headache coming on, I think differently now than how I did 3 months ago.
   (a) never, (b) once in a while, (c) about half of the time, (d) most of the time, (e) all of the time
APPENDIX E

PSYCHOLOGY DEPARTMENT CONSENT FORM
Title of Investigation: Coping with Migraine Headache
Investigator: Olga Konecky
Faculty Supervisor: Dr. David Dush

I understand (a) that this is a non-medical, experimental program designed to assist migraine headache sufferers in relief of headache symptoms, (b) that this program will consist of one introductory meeting, five weekly, 1½ hour group sessions with a therapist and two follow-up contacts, and (c) that active participation in group discussion will be encouraged. I am aware that the purpose of this psychological investigation is to determine how personal coping styles influence headache symptoms. A number of different coping styles will be explored for their possible value in symptom relief.

I also understand that the following requirements must be fulfilled in order to remain in the program:

1) Attendance will be mandatory at all meetings (or else a make-up session will be arranged).

2) This program will be considered as an adjunct to continued medical supervision, not as a replacement.

3) Contact with a family physician will be maintained throughout the investigation.

Do you agree to the above requirements? __________________________

Having read and understood the description of the program as presented above, I agree to participate in this investigation. I understand that I am free to withdraw my consent and terminate my participation at any time.

Signed by __________________________ Date __________________________
APPENDIX F

PHYSICIAN REFERRAL FORM
Based on my familiarity with ______________________ as a patient, I find no medical reason to preclude his/her involvement in a psychological and educational program to assist relief of headache symptoms. I understand that treatment will be presented as an adjunct to my continued medical supervision, not as a replacement. I also understand that the principal researcher, David M. Dush, Ph.D., Department of Psychology, will refer the above client to me should he become aware of any deterioration of symptoms.

______________________________
Physician's signature

______________________________
Date

[ ] Check here if you wish to receive a copy of the results of the investigation

Please list your address: __________________________

__________________________
Zip
APPENDIX C

PERMISSION TO TAPE RECORD FORM
PERMISSION TO TAPE RECORD

I, ____________________________, do hereby give my full permission to the Drake University, Department of Psychology, to tape record the research sessions for migraine headache, of which I will be a participant, with the understanding that these tapes may be shown to other participants in the program who were unable to attend the scheduled meeting or other professionals with legitimate interest in the treatment techniques being used. I understand that my full name will not be given and that these tapes will not be played to the general public at any time.

______________________________
Participant's signature

______________________________
Date
APPENDIX H

TREATMENT MANUALS
Outline for Cognitive Coping and Behavioral Self-Control

Treatment Groups

Two Weeks before training — Introduction
A. Treatment overview and participants' responsibilities
B. Introductions
C. Baseline recording procedures
D. Releases and questionnaires

Week One —
A. Migraine psychophysiology
B. Stress-management rationale (either cognitive or behavioral)
C. Introduction to self-monitoring

Week Two —
A. Introduction to graphing
B. Characteristics of self-statements that influence emotions *
   Environmental dimensions associated with stress **
C. Problematic self-statements and the consequences they specify *
   Functional analysis of headache-related behaviors **

Week Three —
A. Graphing
B. Relaxation rationale
C. Relaxation training (16 muscle groups)
D. Step(C) of week two - continued
E. Identification of personal self-statements *
   Identification of personal behaviors **

Week Four —
A. Graphing
B. Relaxation training (by recall and comparison)
C. Step(∗) of week three - continued
D. Introduction to cognitive reevaluation *
   Goal setting and self-monitoring progress **

   Pass out handout on cognitive reevaluation (see Appendix L) *
   Pass out handout on self-management strategies (see Appendix M) **

Week Five —

A. Graphing
B. Relaxation training (by recall and comparison)
C. Synopsis of key points presented
D. Group discussion of learning experiences
E. Review of handouts from week four
F. Strategies for maintenance

* Applies to the cognitive group only
** Applies to the behavioral group only
Part I — 5 minutes

Welcome everyone and thank them for coming. Introduce yourself, your background and qualifications for conducting the study. Explain nature of faculty supervision and preview agenda (overview of program, requirements for participation, participant's expectations, introductions, instructions for symptom monitoring and completion of releases and questionnaires).

Part II — 20 minutes

A. Program Overview

1. experimental

2. focus: training in progressive muscle relaxation and stress management strategies designed to provide assistance in relieving headache symptoms

3. other components
   a. overview of migraine psychophysiology
   b. close monitoring of headache symptoms and examination for patterns
   c. sharing of experiences (want everyone to be as comfortable as possible so should never feel pressured to answer if would rather not).

B. Requirements for participation

1. respect confidentiality of what is discussed

2. no cost

3. attendance requires at all meetings (opportunity to make up no more than two missed meetings by listening to the tape of that meeting prior to next meeting).

4. completion of a series of questionnaires and release forms

5. best effort at monitoring headache symptoms

6. availability for six week follow-up
C. What to expect from program

1. assistance in minimizing headaches versus cure
   a. not enough advanced research to promise cure
   b. no interference with medications
2. slow trends in relief, gradual or delayed improvement
3. difference across people in response to training (why individualization of strategies and sharing experiences is important)
4. phone call in one week to let you know about weekly meeting times

Skepticism is natural but the best advice is to suspend judgement until completion of entire program.

**Part III -- 20 minutes**

Ask participants, in turn, to state their name, a little about themselves, and some of the treatments they've tried for their headaches.

**Part IV -- 15 minutes**

A. Explain symptom monitoring

1. direct participants' attention to packet of handouts in front of them
2. distinguish between migraine and tension headache symptoms via related handout (see Appendix J)
3. present transparency of headache data card (see Appendix B) and explain:
   - intensity rating scale
   - hourly recording of intensity
   - recording of medication
   - recording of symptoms
   - importance of filling in name, date and adding daily intensities
4. emphasize importance of on-the-spot monitoring
   a. is most accurate
   b. may later serve as a cue to apply coping skills
Part V — 30 minutes

Remind participants to take home headache data cards for baseline recording and the physician release form. Instruct them to get the following questionnaires from their folders, complete them and return them to their folders when they finish:

1. Pain and Health Concerns Questionnaire
2. Process Questionnaire
3. Rotter's Locus of Control Questionnaire
4. Zuckerman and Lubin's MAAC
5. Lanyon's PSI
Week One: Therapist Manual — Migraine Psychophysiology

Part I — 35 minutes

A. Introduction
   - collect physician referral forms
   - preview agenda

B. Migraine psychophysiology

1. Prevalence and characteristic symptoms
   a. afflicts 5-10% of the U.S. population (equals one out of every 10 to 20 people)
   b. major characteristics: periodicity and irregularity of symptoms
   c. common accompaniments of head pain: nausea, vomiting, anorexia, unnatural paleness
   d. other accompaniments: edema of hands, eyelids or other parts of face, constipation, diarrhea, chills
   e. characteristic symptoms of prodromal or preheadache phase: visual, motor or mood disturbances (e.g., blind spots, seeing flashes of light, focusing difficulties, dizziness) — are reliable predictors of headache

2. Biochemical and vascular factors
   a. present related transparency (see Appendix I) and review
   b. relate vasoconstriction process to stress; describe where coping skills training probably acts
   c. describe action of pharmacological treatments

3. Dietary factors
   a. chemical tyramine (a vasoconstrictor) tends to aggrivate symptoms — it's found in fish, cheese, beans, dairy products
   b. other precipitants: sometimes monosodium glutamate, alcohol, chocolate
   c. role of allergies: indirect, by acting through nasal membranes
d. relation to stress: diet a more reliable predictor of headache when it accompanies periods of stress

4. Hereditary factors

a. how best examined: identical twin studies - found a 60-100% chance that twins in a set will be afflicted with migraine, therefore still need to account for those 40% of cases where one twin in a set did not get headache

b. present day consensus: interaction between environment and heredity exists, such that in unfavorable circumstances a person without adequate coping skills will get a migraine instead of something else such as a fever or an ulcer because of this inherited predisposition

c. is speculation that there is an inherited instability of the vascular system

5. Hormonal influence

a. examples of: headaches often coincide with mensus, are intensified by oral contraceptives or disappear during pregnancy

b. is also speculation that these interact with stress since many headaches which coincide with menopause still persist after menopause (learning is also involved)

6. Relevance of sleep — too much sleep on weekends has reported to trigger pain (may result in a decrease of O₂ and an increase of CO₂)

7. Anecdotal ways to reduce pain:
   - apply pressure to extracerebral arteries on affected side of head (give examples)
   - apply ice pack
   - drink coffee at first indication of pain
   - stand on your head

   Problem: All produce unreliable/inconsistent results

8. Importance of psychophysiological model — emphasizes the need to monitor events much earlier than time of pain onset.

C. Questions - Ask if there are any comments/questions regarding the above presentation and discuss.
Week One: Therapist Manual — Behavioral Group Rationale

Part II — 40 minutes

Because the vasoreactivity associated with migraine attacks can be frequently triggered by stress (a vasoconstrictor), you can learn to get some relief of your headache symptoms by learning to manage your reactions to stress. Stress, which is another word for anxiety or intense emotional reactions, occurs as a result of the way in which we respond to stimulation from our social and/or physical environment. Consistently interacting with certain people or things in a manner which does not produce optimal return effects from the environment will result in stress. In order to manage stress you need to identify those aspects of your behavior that are not up to par in situations preceding or during headache, and then make definite plans to change that behavior so that it produces more satisfactory interactions with your environment and is therefore incompatible with stress.

ABC Model. Psychologists have developed the following model to explain why we act the way we do in the context of our surroundings: Every behavior (B) is preceded by an antecedent (A) and followed by a consequence (C). (Diagram the model, while defining terms): The antecedent is that object (person, place or thing) in your environment that stimulates you to respond in some way. Your behavior refers to exactly what you do (how you act, what you say, etc.). The consequence is that object in the environment which changes as a result of your behavior and produces an effect on you (good, bad or neutral). According to this model, the antecedents and consequents are what control behavior.
Types of A's and C's. Consequences can be either good, bad or neutral. If the consequence which follows your behavior is neutral, you will not likely attend to the antecedent of the interaction and your behavior will probably not occur again under the same or similar circumstances. On the other hand if a good and satisfying consequence follows your behavior, that behavior will be very likely to occur again under similar conditions and you will most likely remember the antecedent of that interaction. If behavior is followed by an unpleasant event, you will also probably remember the antecedent of that interaction but your behavior will be less likely to occur again under similar situations. In summary, when either satisfactory or unsatisfactory consequences follow a behavior you will most likely remember the antecedent to that interaction, but in the former case you will be more likely to respond in the presence of that antecedent when it occurs again and in the latter case you will not.

The relation to stress. Differentiating between antecedents, consequences and behavior is important for understanding stress. Stress can result when your behavior is followed too often by unpleasant consequences or when there are too many antecedents in your environment that you are responding to with tension (because these remind you of unpleasant events). Thus, to control stress you need to identify the antecedents in your environment that are frequently triggering tension or the behaviors that are often followed by unpleasant events, and then plan on deliberately changing some of these antecedents or consequences so that your behavior is more suitably controlled and counteracts stress.
Apply model to example. Let's apply this model to the general problem of procrastination. Say this has been identified as reliably proceeding anxiety and stress.

1. Break situation down as follows:

A (antecedent)                    R (behavior)                    C (consequence)
sitting at table ready to write a project or proposal. pick up pencil, write sentence #1 and read good effect
write sentence #2 and read bad effect
revise sentence and read good effect
rewrite sentence #2 paper looks neat bad effect
write sentence #3 and read bad effect
make coffee smells good
drink coffee at table tastes good
revise sentence #3 bad effect
smoke cigarette tastes good
call friend anticipate pleasant lunch
clean floor date for tomorrow
gets you away from table

Thus, as the deadline draws near you become more and more tense. The day before the deadline you develop a splitting headache but stay up all night and get the proposal done and vow never to procrastinate again.

2. Ask participants to identify the behavioral excesses or deficits in the above situation which are interfering with completion of the task.

3. Differentiate between short term (immediate consequences) and long term (headache and stress) effects.

4. Point out how all competing behaviors are maintained by short-term positive effects (occur because are more satisfying than writing at the time) and also how the table can become an antecedent for stress (triggers avoidance behavior by being associated with writing poor sentences).

5. Ask participants for advice on how the relevant behaviors can be more appropriately controlled (e.g., what consequences in the above situation can you arrange to follow desired behavior?) and for ideas on decreasing avoidance behavior (e.g., relaxation).

6. Emphasize the importance of carefully identifying the most immediate and salient A's and C's.
Optimal versus unoptimal stress. Stress (like A's and C's) can also be differentiated into types and all levels are not necessarily bad. Although high stress levels can promote tense, jittery behavior and too low stress levels can promote sluggish, depressed behavior, a moderate amount is usually necessary for optimal responding. Moderate stress enables a person to more accurately attend to the cues in his environment that are likely to facilitate good performance.

For example if I did not feel a little nervous about the possibility of presenting an unorganized speech, I may not have as deliberately attended to the major points that I wanted to make and this presentation would have been less effective. The key to managing stress is to be able to sense when your level of stress is getting too high or too low and then doing something about it.

Questions. Ask participants if they have any questions regarding this perspective and discuss.

Part III — 15 minutes

Self Monitoring. The best way to identify events contributing to stress is by recording the details of situations (where you are, who is around you, what are you doing, etc.) that reliably precede or are associated with headache or tension. This is what you will be asked to do for next week.

1. Show transparency of self-monitoring sheet (see Appendix K)

2. Explain what to record in columns using the procrastination situation as an example.

3. Ask subjects to volunteer examples of personal situations they believe may be influencing their headaches and encourage them to explain what they would record during self monitoring.
4. Emphasize the importance of being specific enough about the antecedents so that situations triggering stress can be differentiated from all others.

5. Relate point #4 to the procrastination example: The person may have originally believed that (s)he procrastinated whenever (s)he had anything complex assigned to do, but instead discovered that it was not the complexity but the unfamiliarity of the task that triggered procrastination. Thus, specifically identifying stress-related antecedents can help you in identifying the relevant behaviors to target as goals. In this case they were those leading to an increased familiarity with the project (e.g., asking boss for additional material to read so that person has more facts on which to base his/her writing).

Assign Homework. Self-monitor headache related situations for one week and continue recording headache symptoms on data cards.
Week One: Therapist Manual — Cognitive Group Rationale

Part II — 40 minutes

Because the vasoreactivity associated with migraine attacks can be frequently triggered by stress (a vasoconstrictor), you can learn to get some control over the frequency and/or intensity of your headaches by managing your reactions to stress. From a psychological perspective, stress, which is another word for anxiety or intense emotional reactions, does not often occur because of our more or less automatic reactions to the environment (e.g., touch a hot stove, then pull hand away and feel pain; hear something bang very loudly, then jump and scream) but more often stems from our beliefs, self-statements or expectations (are called cognitions) about the situation. Stated another way, it is not so much the situation but our interpretation of it that influences the way we feel and subsequently act.

ABC Model. Psychologists have developed a model that integrates thoughts, actions, emotions and events and provides a perspective for examining stress. (Diagram model while explaining terms.) The situation or social interaction that we are in (referred to as A) does not immediately give rise to how we act and feel (C) but is mediated by our cognitions (beliefs, self-statements and expectations — referred to as B) about A. When emotions which are intense and disruptive or behaviors producing increased muscle tension build up, stress results. Notice that all unpleasant consequences are mediated by B. Thus, in order to control stress you need to make deliberate attempts to identify B and then consistently work on reevaluating
Examining B. The connection between self-statements and consequences may be initially hard to see, since one does not have to be aware of the thought for it to influence how (s)he acts or feels. However, after a person is trained to track his/her thoughts (s)he can usually repeatedly identify that the interpretation of the situation preceeds the emotional response. It is probably easier to establish these sorts of connections in your own situations by working backwards: identify the emotion first, then record details of the situation in which the disturbing emotional response occurred and finally focus on identifying the thought.

Examples. Let's look at some examples on how two different types of self-statements can result in two different emotions although the stimulating situation is the same. Person A is pretty excited about going to a party, whereas person B is nervous and pretty tense. After examining their self-statements, person A has noticed herself saying, "I'll know half of the people there and half I won't know. It will be fun to see the half that I know again and interesting to meet the half that I don't know. Maybe I'll make some new friends." Person B has noticed herself saying, "I'll know half of the people there and half I won't know. What if I say or do something dumb? All of the people I know there will see me and will think I'm a jerk. Then the people I don't know won't want to meet me." Thus, based on what they are saying these two people are feeling very differently and, because of it, are likely to act differently too. If person B is prone to get headaches, she may very likely get one if her self-statements are very repetitive and keep triggering tension. There are a number of ways person B can reevaluate the situation and turn her
self-statements around but first we will focus on becoming more familiar with the types of self-statements that trigger tension.

**Maladaptive self-statements.** Often these types of self-statements are called maladaptive in the sense that they interfere with a person's responding optimally to his environment. For instance, person B does not seem to be aware that the opportunities person A is responding to are also available to her. Just because someone has these type of self-statements does not in any sense imply that they are a bad person, because we all have them. It's just when they reach the point of producing a high stress level, that they need to be controlled.

**Practice applying model.** Diagram the ABC model using the example of losing a job as the antecedent and the emotional reactions of content, sad and depressed as the consequences. Ask participants to generate examples of self-statements that could mediate those three levels of emotional intensities (e.g., "It's probably for the better, My boss wasn't fair" for content, "I'll miss my friends I worked with" for sad and "I'm a failure" for depressed).

**Optimal versus unoptimal stress.** There are different levels of stress corresponding to different levels of emotional intensities, therefore all stress isn't bad. While too high stress levels promotes sluggishness and depressed behavior, an optimal level is usually necessary for effective performance and a sense of well-being. In fact, a moderate level of stress can actually facilitate performance by making us more cautious and sensitive to the cues in our environment that lead to good results. For example, if I had not said to myself, "there's a possibility that things won't run smoothly and
my supervisor won't be too happy with me," and experienced some tension before talking today, I may not have taken the time to review my outline and could have easily forgotten to mention important points. Too high or too low stress may have interfered with my attending to important cues.

Questions. Ask participants if they have any questions about this perspective and discuss.

Part III — 15 minutes

Self-monitoring. The best way to identify situations contributing to tension and headache and identifying self-statements to modify is by recording the details of situations that reliably precede or are associated with headache or disturbing emotional reactions. (First, notice the disturbing emotion or onset of headache symptoms, then record A, and then determine B.) This is what you will be asked to do for next week.

1. Show transparency of self-monitoring sheet (see Appendix K).

2. Explain what to record in columns using a job related situation (e.g., the boss yelled at me) as an example.

3. Ask subjects to volunteer examples of personal situations they believe may be influencing their headaches and encourage them to explain what they would record during self-monitoring.

4. Emphasize the importance of being specific enough about the antecedents so that situations triggering stress can be differentiated from all others.

Assign homework. Self-monitor headache related or emotional situations for one week and continue recording headache symptoms on data cards.
Week Two: Therapist Manual for Behavioral Group

Part I — 25 minutes: Graphing

1. Explain how to plot total daily headache intensities onto graph by modeling via transparency (read labels and explain calibrations along ordinate and abscissa, plot some data points and explain how to connect points).

2. Instruct participants to plot their intensities for the past three weeks. Assist those having difficulty with plotting or connecting data points and encourage others to do so also.

3. Briefly discuss any trends or associations with antecedents that participants may notice.

Part II — 30 minutes: Environmental Dimensions

1. Review (a) impact of stress on headache, (b) ABC model, and (c) self-monitoring.

2. Ask participants to look at their self-monitoring sheets and to comment on any consistencies between antecedents that they can notice.

Environmental dimensions related to stress. For purposes of enhancing your ability to identify stress-related antecedents, I'd like to discuss some environmental dimensions researchers have identified as associated with stress. The first is support. Lack of supportive individuals in the environment or presence of individuals with rejecting attitudes has been demonstrated to be related to delays in physical and emotional development and a greater susceptibility to disease. Another dimension is cohesion (how close the members in your environment feel toward each other). This has been associated with a reduction in stress. Thus, aspects of your environment can have an important impact on how much stress you experience. Other dimensions identified as affecting stress levels include (a) too much responsibility, (b) too little self-expression or communication, (c) too little environmental clarity or control, and (d) too little organization.
Notice that the presence of these dimensions in either extreme (too much or too little) can also probably affect stress.

1. Repeat the last four dimensions one at a time and ask participants to present examples of how extremes of the dimension in either direction (too much or too little) might affect stress.

2. Ask participants to refer to their self-monitoring and examine whether any of the antecedent situations they've recorded reflect any dimensions mentioned above. Also, ask participants to conceptualize dimensions which they have identified as occurring, in terms of extremes.

Part III -- 35 minutes

Functional analysis of headache-related situations. Present the following headache-related situation of being late for work on the transparency:

\[ \text{A} \rightarrow \text{B} \text{ (behavioral chain)} \rightarrow \text{C} \rightarrow \text{D} \text{ (long term effect)} \]

- getting up
- one hour early
- showering
- dressing/grooming
- cleaning room
- making breakfast
- washing dishes
- eating breakfast
- reading paper
- collecting work material
- see that you left
- 5 minutes late
- feel clean
- look neat
- looks nice
- prepares you for eating
- " " "
- tastes good
- informs you
- prepares you for work
- feel nervous

1. Ask participants to identify some potential behavioral excesses or deficits in the above situation (e.g., too much time spent organizing work materials, requiring too much order before stop cleaning room, too many dirty dishes).

2. Based on examples identified above, encourage participants to set possible goals (e.g., organize work materials or wash dishes night before, clean less - only make bed).

3. Examine consequences. Distinguish between things you want to do (positive reinforcement), things you have to do (negative reinforcement) and negative effects (punishment). Mention how doing things you want to do makes you feel best and is most incompatible with stress.

4. Discuss some strategies for reaching goals and establishing new behaviors.
a. Most effective way of increasing behavior is to follow by contingent reinforcement (explain the term "contingency").

b. Most effective way to decrease behavior is to plan on doing something positive and incompatible in its place, and to follow this by reinforcement.

c. Can also restrict doing some of the things you like to do until after you meet your goal for the situation (e.g., don't read newspaper unless you finish all other activities within 45 minutes before you go to work).

Present Situation #2: Too much responsibility due to making too many commitments.

1. Write down antecedent, friend asks a favor, on the transparency and encourage participants to break down the hypothetical situation:
   - ask them to identify a probable B (e.g., saying yes)
   - ask them to identify a probable C (e.g., makes friend happy)

2. Relate many instances of B to negative long term effects (e.g., too many commitments, too much conflict, no time for relaxation and buildup of vasoconstriction).

3. Encourage participants to identify potential goals for above situation (e.g., increase effectively refusing inappropriate requests).

4. Briefly describe concept of assertiveness and define (a statement that genuinely and matter of factly describes your feelings while also demonstrating sensitivity towards the other person's feelings).

Homework. Focus on more closely examining and recording the A's, B's, and C's of situations that seem particularly connected with your headaches. Also, continue recording your symptoms on the headache data cards.
Week Two: Therapist Manual for Cognitive Group

Part I -- 25 minutes: Graphing

Same procedure as followed in the cognitive group.

Part II -- 30 minutes

1. Review (a) impact of stress on headache, (b) ABC model, and (c) self-monitoring.

2. Ask participants to look at self-monitoring sheets and to comment on any consistencies between antecedent events or on any anxiety-related self-statements that they have noticed.

Characteristics of self-statements that influence emotions.

In order to make you more aware of what you may be saying to yourself in stress-related situations, I'd like to discuss the nature of self-statements that commonly influence emotions. Three characteristics of these self-statements have been identified. The first is that they tend to be automatic. They occur very quickly, so that you may feel yourself experiencing tension or emotions before you believe that you could have had a chance to think. This emphasizes the importance of deliberately stopping to examine your cognitions, otherwise you may not notice them. The second characteristic is that they are continual and repetitive. Because of this, you can increase your tension by making a very intense self-statement to yourself or by making less intense self-statements over and over again.

Example. Let's look at the example from last week. Remember that in the situation of losing a job we speculated the statement, "I must be getting worse" would produce a little anxiety; whereas the statement "I'm a failure and can't do anything now" would produce much greater anxiety or even depression. (Diagram via the ABC model on the trans-
Notice that the second statement is much more absolute than the first, and would probably act more quickly and have greater impact in bringing about headache or stress. However, if the first statement was to consistently and continuously repeated over time (e.g., "I must be getting worse, I just must be, I am worse", etc.), you can probably see how this could produce just as intense of an effect. Repetitiveness is therefore another variable to consider when examining self-statements since statements which may sound like they could not initially have a big impact on headache can, by consistently triggering stress.

Ask participants:

1. How could you change the first statement in the example (by replacing one word) so that it would result in a more optimal effect (e.g., replace must with may).

2. What would saying "I may be getting worse" make you more likely to do that the original statement wouldn't (e.g., investigate, go collect some facts).

Introduce the third characteristic of anxiety-evoking self-statements: Thus, these statements tend to be absolute or slightly biased in the sense that they do not objectively reflect all of the possibilities available to you in your total situation.

Part III — 30 minutes

Examples of anxiety-evoking self-statements and the consequences they specify. Present the following list of self-statements which clinicians have identified as frequently occurring in stressful situations, one at a time, and ask participants (a) for reasons why the statement would not be an optimal evaluation of a person's total situation and (b) to specify conclusions implicated by the statement in an "if...then..." format.
1 (a) I have got to have everyone's attention and approval every single bit of the time (self-statement).

(b) If I don't, then those people will not like me and that would be terrible (conclusion).

2 (a) It is terrible and catastrophic when things are not the way I planned them to be.

(b) Because if this happens, then I can't do anything right and will never be a success.

3 (a) I must be the perfect parent, lover, friend, employee or spouse.

(b) Because if I'm not, I will never be liked by these people and then I'll be no good.

4 (a) I should never let anyone know that they have been inconsiderate to me.

(b) If I do, then these people will be terribly upset with, or hate me.

5 (a) I must be thoroughly competent, adequate, intelligent and/or achieving in all possible respects.

(b) If I'm not, then I will never be a success.

6 (a) I must always work at peak efficiency.

(b) If I don't, then my boss will fire me, or my friends will not approve of me.

7 (a) I must keep all of my friends and accomplishments indefinitely.

(b) If I don't, then it's not worth meeting new friends or working for anything whole-heartedly.

Homework. Work on specifically identifying your automatic self-statements and conclusions they specify in tension or headache-related situations. Record them on your monitoring sheets for discussion next week and continue recording your headaches symptoms on your data cards.
Week Three: Therapist Manual for Relaxation Procedure

Part II — 15 minutes: Relaxation Rationale

I. Introduction

A. Name of procedure we will be using is progressive muscle relaxation training.

B. It involves learning to sequentially tense and then relax various muscle groups within the body while at the same time paying very close and careful attention to the feelings associated with the tension and relaxation.

C. I will not be doing anything to you during the procedure but directing your attention to certain aspects of it. Learning relaxation is a skill like any motor skill so the more you practice, the better you get.

D. Training requires you to tense before you relax because:

1. Strong tension is noticable. Training will allow you to more easily recognize the presence of tension in your everyday situations.

2. The initial tension enables you to get a "running start" in relaxation as the tension is released. This is the easiest way to reduce our tension far below our adaptation level (the level of stress we operate under from day to day). That is what we want to do during training because deep relaxation most effectively buffers stress.

3. Tensing provides a strong contrast to feelings of relaxation and enables you to appreciate the difference between these sensations.

II. Purpose

A. As you learn to recognize and pinpoint feelings of tension and relaxation, you will become a better discriminator of stress when it occurs in your everyday situations.

B. When applied to your everyday situations, it will act as a buffer against stress.

C. For this reason, it will enable you to more clearly focus on the behavioral antecedents of stress (or, for the cognitive group, on your cognitions and evaluations of events).

III. Tensing Instructions: Suggest ways to produce tension in each of the sixteen muscle groups that will be utilized during training
(see Bernstein and Borkovec, 1973) and have participants establish that they can produce tension in each group.

IV. Additional Instructions

A. Various muscle groups will also be compared with others in terms of depth of relaxation.

B. Release tension immediately upon cue, instead of gradually.

C. Once a muscle group is relaxed try not to move it.

D. If your mind wanders and interferes with relaxing, try to focus more on the tensing and relaxation instructions.

E. Questions and comments.

F. Explanation of heart rate assessment.

Part III -- 35 minutes: Relaxation Training

A. Assess heart rate (beats/10 seconds) and have participants record in folders.

B. Instruct participants to make themselves comfortable in chairs.

C. Dim lights.

D. Guide participants through procedure.

E. Assess heart rate after training and have participants record.

F. Turn on lights.

G. Questions or comments.

H. Suggestions for homework - practice training at home for at least 20 minutes daily.
Week Three: Therapist Manual for Behavioral Group

Part I — 10 minutes: Graphing

Have participants plot total daily headache intensities from past week and comment on associations between behavioral antecedents and intensities.

Parts II and III

See therapist manual for relaxation procedure

Part IV — 30 minutes

I. Review environmental dimensions associated with stress and procedure for functional analysis

II. Functional analysis of two more headache-related situations

A. Break down first situation of vacationing daughter not keeping house clean on transparency as follows:

A ————→ B ————→ C
mom sees daughter did not clean house
(1) mom yells at daughter (1) daughter walks away mad
(2) mom cleans house (2) house looks neat
(3) mom feels tired

1. Point out the negative short term effects (consequences #1 and #3) and relate to negative long term effects of producing headache (even when mother only thinks of her daughter as coming home again).

2. Encourage participants to give examples of specific ways the parent could reduce tension in the above situation and bring about a more satisfying interaction (e.g., decrease responding angrily and increase assertive replies, or decrease criteria for keeping house clean so that less time is spent cleaning and more time is spent interacting positively with daughter).

B. Behaviors maintained under FR schedules of reinforcement

1. Introduce concept of FR schedules using a pigeon analogue

   a. Diagram cumulative record of an FR pattern with pauses and explain it.
b. Relate pauses in schedule to emotional behavior; pigeons display as schedule requirement gets bigger.

2. Relate schedule control to human behavior

a. Ask participants to provide examples of behaviors which seem to be controlled by FR patterns in their own environments (e.g., job-related behaviors or continuously planning for an upcoming event you're looking forward to).

b. Encourage participants to suggest ways of interfering with high FR schedules so that stress does not build up (e.g., arrange to make work more fun).

c. Prompt participants to provide examples of consequences that could be administered in work-related situations (e.g., coffee break, eat ice cream, a 5 minute walk, phone call to a friend).

C. Questions or comments

III. Homework

A. Continue examining antecedent headache-related situations and try to functionally analyze at least two situations on your sheets before next week.

B. Practice relaxation at home and take note of any observations or difficulties you may encounter.

C. Continue monitoring headache symptoms.
Week Three: Therapist Manual for Cognitive Group

Part I — 10 minutes: Graphing

Same as in the behavioral group.

Parts II and III

See therapist manual for relaxation procedure.

Part IV — 30 minutes

I. Review characteristics of anxiety-evoking self-statements and kinds of consequences they reflect.

II. Emphasize three points

A. Importance of distinguishing between self-statements leading to inappropriate consequences and those leading to appropriate ones.

1. Example: Just because you may have identified that the self-statement, "I must be thoroughly adequate and competent in everything I do," consistently precedes tension or unpleasant emotions that you experience at work, does not mean that you should not strive to do a good job.

2. Discussion: Working to be competent is a very commendable goal; however, if you do not meet it all of the time, it is wrong to conclude that you are a terrible person since we are imperfect by nature. More appropriate emotions would be produced by statements such as, "it is nice when I do a good job, but it is not terrible when I don't" (even though it may be unfortunate or unpleasant). It's important to practice recognizing these types of distinctions because a minor change in interpretations will make a difference in the way you feel.

B. Importance of evaluating the conclusions specified by anxiety-evoking self-statements by examining facts. Work through an example:

1. Ask participants to discuss kinds of facts or evidence they might examine if they were evaluating the self-statement, "if I do not work at peak efficiency, my boss will fire me" (e.g., how many people in your position always work efficiently, how many people in your position who are not as efficient as you have been fired, what are the job requirements under which you got hired, have these changed, what are the chances of you getting fired, statistically, etc.).
2. Ask participants how they could change the "if, then" clause so that the conclusion reflected by the statement is more realistic (e.g., If I do not work at peak efficiency, the boss may not consider me for a raise).

C. How to handle an anxiety-evoking self-statement if the conclusion specified by it is realistic.

1. Example - The self-statement, "If I let go of this rope, I will kill myself," is probably realistic to a mountain climber. However, focusing on it would likely increase the mountain climber's tension so that his ability to attend to important aspects of the sport and skillfully perform is reduced.

2. Conclusion - Best response to these types of self-statements is to deemphasize them by focusing on the positive aspects of the situation.

III. Identification of personal self-statements

A. Instruct participants to work through at least two stressful situations and identify (a) their emotional reactions or responses during stress, (b) the cue(s) in the situation that triggered the tension or stress, (c) what they noticed themselves saying as they became aware of the emotion or stress, and (d) the way in which these statements appear to contribute to tension and headache.

B. Work in turn with each participant and encourage them to share their specification of step 1 above. Encourage members to help others having difficulty identifying cognitive components of their distress.

IV. Homework

A. Continue examining antecedent tension or headache-related situations. Try to specify the A, B and C's of at least two situations on your self-monitoring sheets for next week.

B. Practice relaxation at home and take note of any observations or difficulties you may encounter.

C. Continue monitoring headache symptoms.
Week Four: Therapist Manual for Behavioral Group

Part I — 15 minutes: Graphing and Discussion of Observations

Part II — 30 minutes: Relaxation Procedure

I. Introduction

A. Questions or comments regarding at home practice.

B. Today's version of training will be a condensed form of relaxation as it will involve only seven muscle groups.

C. Review the seven muscle groups involved (see Bernstein and Borkovec, 1973) and have participants establish that they can produce tension in each group.

III. Training

A. Have participants assess and record heart rate.

B. Ask them to get comfortable and close eyes.

C. Dim lights.

D. Guide participants through the condensed version of progressive muscle relaxation.

E. Have participants assess heart rate after training and record.

F. Turn on lights.

G. Questions or comments.

Part III — 45 minutes

I. Review of headache-related situations previously presented (late for work, making many commitments, too much work without breaks, and too much focus on neatness).

II. Identification of personal behaviors

A. Instruct participants to choose two stress-related situations from their self-monitoring sheets and to specify the following:

(a) the antecedent(s) that triggered tension, (b) their response(s) to the situation, (c) the short term consequences of their act(s), and (d) how this could have contributed to headache in the long run.

B. Work in turn with each group member until they have worked through the steps above for at least one specific situation.
C. Review the following stress-related concepts and express them in more specific behavioral terms.

a. Too little environmental clarity - not enough antecedents or clearly defined goals in the situation that motivate you to act.

b. Ineffective self-expression - saying things too emotionally (angrily or rudely) or stopping yourself from saying anything at all when you have something worthwhile to say.

c. Poor communication skills - may reflect concept (b) above or could be due to poor listening skills which may be improved by paraphrasing the other person's statements and correcting misinterpretations.

d. Too little environmental control (for people in positions of authority) - may reflect poor management of employee behavior due to inadequate control of consequences. (They may not exist or may not be relevant, clearly defined or properly administered.)

e. Too little organization - not enough antecedents established which take the form of reminders or too much spontaneous reactions and not enough time set aside to stop and plan.

III. Setting Goals

A. Encourage participants, in turn, to specify their problem in behavioral terms (excesses or deficits) and to identify at least one behavior incompatible with stress that they could focus on increasing. Encourage members to help others having difficulty identifying behavioral components of their distress.

B. Ask participants to quantify this increase and set at least one short-term goal.

C. Pass out Handout (see Appendix M) and go over Section I.

IV. Homework

A. Focus on changing behaviors in stressful situations and meeting your short-term goal(s). Try monitoring this by marking a plus (+) in the top right-hand corner of your data card each time you make a successful behavior change.

B. Practice the condensed form of relaxation at home daily. Apply this in your everyday situations at the onset of headache symptoms or tension.

C. Continue with symptom recording on your data cards.
Parts I and II

Same procedure as followed in the behavioral group.

Part III — 45 minutes

I. Review the four steps involved in making a cognitive analysis of stressful situations (see Step 1 of Section III from week three's manual).

II. Continue with identification of personal self-statements (Step 2 of Section III from week three's manual).

III. Cognitive Reevaluation

A. Refers to testing those self-statements that exist in your imagination against objective reality.

B. First step after statement has been identified is to ask yourself, "Where are the facts that clearly demonstrate to me that this is so?" or "What are the statistical chances that the conclusion reflected by this self-statement will actually happen to me?"

C. Processes that give rise to maladaptive cognitions

1. Overgeneralization: Reaching a conclusion, such as rating your entire essence as good or bad, on the basis of a single incident (instead of simply rating the one experience).

   a. example - If, after getting fired from a job, I conclude to myself, "Because of my bad behavior at work, I am worthless to the core," I would likely experience anxiety or depression. A more appropriate evaluation would be, "What crummy behavior; how unfortunate that I acted so foolishly and now am unemployed. Too bad I didn't pay enough attention to do a better job." This would produce the more appropriate consequence of displeasure and determination to do better next time.

   b. Why evaluation of entire self is bad - (1) promotes self-centeredness instead of problem-centeredness; interferes with empathic listening, and (2) minimizes your chances of satisfaction because instead of asking yourself, "What can I do to become more satisfied and enjoy my existence?", it leads you to ask, "How can I prove that I am worthwhile?". This continuously places you in competition with others and promotes jealousy.
c. Why rating of a particular incident as good or bad is better - enables you to become aware of what you didn't like and increases your chances of acting more effectively the next time without the disturbing, emotional interference.

2. Reacting to a low frustration tolerance
   a. Refers to turning your desires, preferences or wishes into commands, demands or absolute insistencies.
   b. maladaptive self-statements reflected by this: "I must have this expensive china or sports car right away. I need it. I can't stand not having it now. I won't be able to tolerate it."
   c. Ask participants to reevaluate the statements above (e.g., which statements above are not objective descriptors of the situation?, what else can you say in place of that statement?).

C. Questions or comments
D. Pass out Handout (see Appendix L)

IV. Homework

A. Try monitoring your cognitive coping attempts: Put a plus (+) in the top right-hand corner of your headache data card each time you identify a stress-related self-statement. Circle the plus each time you are able to successfully reevaluate it.

B. Practice the condensed form of relaxation at home daily. Apply this in your everyday situations at the onset of tension or headache symptoms.

C. Continue with symptom recording on your data cards.
Part I — 5 minutes: Graphing

Part II — 30 minutes: Relaxation through Recall

1. Introduction

A. Is relaxation training without the initial tensing phase.

B. Will be directing you to identify the presence of any tension in your muscles and to release this tension by recalling the pleasant feelings of relaxation you experienced as you let go of tense muscle groups during previous trainings.

C. In order to be successful in achieving relaxation, it is very important to clearly recall the feelings of relaxation you previously produced, as soon as you direct your muscles to relax.

D. Instruct participants to assess heart rate and record.

E. Dim lights.

II. Relaxation Procedure

A. Guide members through condensed version (7 muscle groups) of relaxation through recall (see Bernstein and Borkovec, 1973).

B. Go through the seven muscle groups again, while instructing members to compare the relaxation in each muscle group to the group just previously relaxed.

C. Review all muscle groups relaxed; then direct members to relax quietly while saying the word calm to themselves with each breath they exhale.

D. Lights on.

E. Have members assess heart rate and record.

F. Questions or comments.

Part III — 15 minutes: Synopsis of Treatment Presentation

I. Influence of psychophysiology on headache (vascular, stress, and additional factors).

II. Strategies for managing stress
A. Value of an ABC breakdown (connect responses to antecedents and consequences).

B. Self-monitoring as an aid to identifying stress-related behaviors (collapse all situations listed and tease out the most common factors).

C. Identification of relevant behaviors to increase by specifying the problem in behavioral excesses or deficits.

D. Establishing self-direction by quantifying behaviors you'd like to increase and setting short-term, behavioral goals (present an example of a plan with an emotional long-term, but behavioral short-term, goal).

E. Strategies to enhance self-control (were briefly discussed).

   1. Make sure every successful change in behavior is followed by a positive effect (arbitrary or natural). Also mention possibility of verbal self-reinforcement.

   2. Could plan on altering antecedent conditions to help facilitate behavioral changes.

   3. May want to restrict some of your already established, pleasurable activities until you meet a short-term goal (if other arrangements are not working).

F. Questions or comments

Part IV — 15 minutes: Discussion

Encourage each participant, in turn, to share their efforts, fails or successes in following through with these strategies and to describe the effect on their headaches.

Part V — 15 minutes

I. Self-control handout

   A. Finish reviewing Sections II and III.

   B. Relate steps to example of increasing assertive behavior, where applicable.

   C. Introduce technique of monitoring frequency of behavior before and after carrying out management plan (for purposes of examining effectiveness of plan).

II. Maintenance strategies
A. How to view onset of headache symptoms in future: not as a failure but as a cue to cope.

B. Ask participants for ways to apply coping strategies if headaches should disappear, then reappear.

C. Some reasons for failing to reach goals
   1. Self-control plan may be defective and in need of revision.
   2. Goals may be set too high, initially.
   3. Failing to monitor progress towards goals so you stop getting feedback on your behavior.
   4. Lack of consistency in rewarding yourself for small gains.

D. Questions or comments

Part VI — 15 minutes

Ask members to complete three questionnaires: (1) Rotter’s Locus of Control, (2) Process, and (3) Program Evaluation Questionnaire. Also, remind participants of follow-up contacts.
Week Five: Therapist Manual for Cognitive Group

Parts I and II — 35 minutes

Same procedure as followed in the behavioral group.

Part III — 15 minutes: Synopsis of Treatment Presentation

I. Influence of psychophysiology on headache (review of vascular, stress, and additional factors).

II. Strategies for managing stress

A. Importance of cognitive rationale, and of the identification and reevaluation of cognitions.

B. Specification of anxiety-evoking cognitions

1. Become aware of them by noticing characteristics (e.g., automatic, repetitive, include phrases such as can't be, must have, awful, terrible, etc.).

2. Importance of self-monitoring: (a) to identify stress or headache-related situations and (b) to get information regarding frequency and types of self-statements made.

3. Identifying the self-statement specific to the situation by working backwards (specify the disturbing consequence, then the antecedent and finally the mediating cognition).

4. Phrasing self-statements in and "if -then" manner for purposes of specifying conclusions reflected by them.

C. Cognitive Reevaluation

1. Importance of recognizing the subtle distinction between conclusions contributing to appropriate, and those contributing to inappropriate, emotions.

2. Objectively evaluating conclusions specified by self-statements by collecting evidence and facts from the situation. — For example, evidence needed to support the phrase, "If I don't do things exactly right at work, I'll be a failure all day", would include being a failure in everything else you do for the rest of the day (such as, driving your car home, as a wife or husband, friend, parent, gourmet cook, etc.).

3. Using the processes identified on last week's handout as an aid in reevaluation.

D. Questions or comments
Part IV -- 15 minutes

Encourage each participant, in turn, to share their efforts, failures, or successes in applying these strategies and to describe the effect on their headache.

Part V -- 15 minutes

I. Complete reviewing cognitive reevaluation handout

A. Example reflected by question 2(b): is an insult; commonly, these will not harm you unless you take them too seriously.

B. Examples of self-statements commonly mediating emotional responses to insults: How terrible of this person to insult me, this is awful, that person is rotten to the core (also an example of overgeneralization), and I will not tolerate this.

1. Have participants identify phrases in the above example that are debatable and encourage them to dispute these by examining facts (e.g., rotten to the core would mean that someone not only behaved rottenly to you in one situation, but behaves rottenly in every situation, is rotten to his friends, family, neighbors, etc.).

2. Ask for examples of alternative responses to the insult situation that would lead to more appropriate emotions (such as, everyone is entitled to some mistakes - no one is perfect, I'm not happy with this but that's tough - life is tough, and I am sensitive to this but I won't be intimidated).

C. Relate reevaluation to the likelihood of behaving more assertively: first step in many assertive programs is cognitive — involves noticing and toning down self-statements reflecting anger or worry of rejection.

D. Discuss question #4 and relate to examples: seeing a frown on a passerby's face and thinking, "He is disgusted with me" or having things go wrong and concluding, "fate is against me".

II. Maintenance strategies

A. Continuously examine, reevaluate, and replace anxiety-evoking self-statements with others leading to more appropriate emotions.

B. Once you reach a conclusion based on reason, continuously go back to it.
C. Goal of cognitive reevaluation is not to get rid of emotions, but to tone them down.

D. How to view onset of headache in future: not as a failure but as a cue to stop and cope.

E. Ask participants for way to apply coping strategies if headache should disappear, then reappear again.

F. Some reasons for failing to control anxiety and disturbing emotions.
   1. Negative self-statements may interfere with the consistent application of coping attempts (may try applying self-statement, "gain rarely exists without pain").
   2. Failing to monitor anxiety-evoking self-statements and successful coping attempts (so that you have no idea of how you progress).
   3. Lack of consistency in encouraging and rewarding yourself for small gains.

G. Questions or comments

Part VI — 15 minutes

Ask members to complete three questionnaires: (1) Rotter's Locus of Control, (2) Process, and (3) Program Evaluation Questionnaire, and remind participants of follow-up contacts.
APPENDIX I

TABLE OF SOME PHYSIOLOGICAL FACTORS INVOLVED IN MIGRAINE
# Some Vascular and Biochemical Factors Involved in Migraine

<table>
<thead>
<tr>
<th>Preheadache (Prodromal) Phase</th>
<th>Headache Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Vasoconstriction of extracranial (and possibly intracranial) arteries.</td>
<td>1. Vasodilatation of extracranial (and possibly intracranial) arteries.</td>
</tr>
</tbody>
</table>
| 2. Decrease of cerebral **blood flow**.  
(More blood flows to the extremities) | 2. Increase of cerebral blood flow.  
(Less blood flows to the extremities) |
| 3. Presence of increased levels of serotonin.  
This indirectly results in a higher pain threshold (greater tolerance to pain). | 3. Presence of decreased levels of serotonin.  
This indirectly results in a lower pain threshold (so that same amounts of stimulation produce greater amounts of pain). |
APPENDIX J

MIGRAINE VERSUS TENSION HEADACHE HANDOUT
### BASIC CHARACTERISTICS OF MIGRAINE VERSUS TENSION HEADACHE:

<table>
<thead>
<tr>
<th>MIGRAINE HEADACHES</th>
<th>TENSION HEADACHES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pain usually begins as a throbbing or pulsating sensation.</td>
<td>1. Pain is deep and steady; may be described as &quot;feeling like a tight band around your head&quot;.</td>
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<tr>
<td>2. Pain is usually present only on one side of your head.</td>
<td>2. Pain usually occurs on both sides of your head.</td>
</tr>
<tr>
<td>3. Other symptoms such as nausea or vomiting occur with these headaches.</td>
<td>3. Pain can be described as a &quot;dull ache&quot;.</td>
</tr>
<tr>
<td>4. A preheadache phase, consisting of motor or visual (e.g., blind spots or seeing stars) disturbances, exists.</td>
<td>4. If you have headaches daily, they are likely to be tension headaches, in part.</td>
</tr>
<tr>
<td>5. Onset of headache is often abrupt or sudden.</td>
<td>5. Onset of headache is usually slow and gradual.</td>
</tr>
</tbody>
</table>
APPENDIX K

SELF MONITORING SHEETS
<table>
<thead>
<tr>
<th>Where are (were) you?</th>
<th>Who else is (was) with you?</th>
<th>What are (were) you doing?</th>
<th>What is (was) the immediate effect?</th>
<th>By how much time did this situation precede headache?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Where are (were) you?</td>
<td>Who else is (was) with you?</td>
<td>What are (were) you thinking?</td>
<td>What are (were) you doing?</td>
<td>How do (did) you feel?</td>
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</tbody>
</table>
APPENDIX L

SELF MANAGEMENT HANDOUT
I. Goals and Self-Direction:

1. Identify the stressful situations preceding headache and specify the problem generally (e.g., too much responsibility, work without fun, too little communication, lack of organization, etc.).

2. Specify the problem in behavioral terms so that it is recognizable and countable.

3. Identify whether the problem is a behavioral excess or deficit.

4. Set long-term and short-term goals (in terms of behaviors you'd like to increase).

II. Self-Awareness and Control:

5. Develop a self-monitoring system by which to examine your present state of affairs.

6. Collect data — Observe and record the frequency, length or duration of your behavior (B).

7. Examine the A's (antecedents) and C's (consequences) maintaining B.

8. Come up with a plan for effective self-control by determining how to ensure changes in either A or C.

9. Carry out your plan.

10. Monitor progress toward goals and observe the respective changes in B.

III. Maintenance and Continued Control:

11. Continue to monitor changes in your behavior so that you can evaluate success.

12. Keep consistently reinforcing yourself for every adaptive behavior change.

13. Examine progress continuously and revise your plan until you have met your goals.

14. Fade out your plan as your behavior becomes maintained by natural events.

15. Identify and work towards new goals.
APPENDIX M

COGNITIVE REEVALUATION HANDOUT
QUESTIONS TO ASK YOURSELF THAT MAY HELP IN COGNITIVE REEVALUATION

1. Are you overgeneralizing, e.g., rating your entire essence as good or bad based on one particular experience or incident?

2. Are you reacting to a low frustration tolerance?
   (a) are you turning your desires, preferences, or wishes into commands, needs or absolute insistencies?
   (b) are you trying to change obnoxious stimuli when it is not possible or preferable, instead of accepting them?

3. Are you expressing or venting your emotions without changing your maladaptive self-statements?

4. Are you making an arbitrary inference: Personalizing things or drawing a conclusion when evidence is lacking or is to the contrary?

Additional Questions to Test for Adaptive Thinking

1. Is this thinking factual?

2. Will this thinking help me protect myself?

3. Will this thinking help me achieve my goals today and tomorrow?

4. Will this thinking help keep me out of significant trouble with others?

5. Will this thinking help me feel the emotions I want to feel?
APPENDIX N

PROGRAM EVALUATION QUESTIONNAIRE
DIRECTIONS: Please circle the one answer you feel is most nearly correct for each of the statements listed below:

1. This treatment program provided new and useful information.
   (a) Strongly agree  (b) Agree  (c) Mildly agree  (d) Mildly agree  (e) Disagree  (f) Strongly disagree

2. Parts of the program were unreasonable.
   (a) Strongly agree  (b) Agree  (c) Mildly agree  (d) Mildly disagree  (e) Disagree  (f) Strongly disagree

3. The experimenters were helpful and well-informed.
   (a) Strongly agree  (b) Agree  (c) Mildly agree  (d) Mildly disagree  (e) Disagree  (f) Strongly disagree

4. I would recommend this program to a friend.
   (a) Strongly agree  (b) Agree  (c) Mildly agree  (d) Mildly disagree  (e) Disagree  (f) Strongly disagree

Please comment on the following questions:

1. What parts of the program did you feel were the most useful?

2. What parts of the program did you feel were the least useful?

3. What strategies have you learned to use to control your headache as a function of this program?

Have you any other comments or suggestions for us?
APPENDIX C

FOLLOW-UP LETTER
FOLLOW-UP LETTER

Hi. I'm contacting all those who participated in the migraine study once again. To complete the study, I still need to get two more weeks of information about your headaches. Enclosed are some recording cards for you to monitor your headaches, medication, and symptoms like you did before. Please do this for two weeks after you receive this letter and then mail the information back to us in the self-addressed, stamped envelope provided. Let us know even if you have no headaches during the next two weeks. Hope you've been enjoying the warm weather we've been having and thank you for helping us out.