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**The Role of Compliance, Hypnotic Imagery, and Nonhypnotic
Imagery in the Treatment of Recurrent Headaches**

Manuel A. Arango Jr. (III)

Supervised by Nicholas P. Spanos, Ph.D.

**A thesis submitted to the Faculty of Graduate Studies
and Research in partial fulfillment of the requirements
for the degree of
Master of Arts**

**Department of Psychology
Carleton University
Ottawa, Ontario, CANADA
September, 1991**

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Degree of Master of Arts

.....

Thesis Supervisor

.....

Chairman of the Department

Carleton University

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The Role of Compliance, Hypnotic Imagery, and Nonhypnotic Imagery In the Treatment of Recurrent Headaches

Introduction

It has been found that pain is the most frequently reported symptom in the majority of medical settings (Merskey, 1980). In light of this, management of pain has been a prime goal of both medical and non-medical interventions within chronic pain populations. Non-medical approaches have been especially appealing due to the aversive side effects which are associated with pharmacological interventions. Use of such approaches has increased markedly within the past decade particularly in the case of treatments for recurrent headache pain.

The nature of non-medical interventions for recurrent headache pain have typically been multi-faceted in nature. Treatment packages have generally employed some or all of the following pain management approaches, viz.; cognitive-behavioral strategies (e.g., distraction, imagery, cognitive reinterpretation) hypnosis, biofeedback, and relaxation training. Furthermore, it is reported that the aforementioned approaches are not mutually exclusive in that they often share similar mechanisms of action (Litt, 1986). Imagery use has been implicated as a potential common denominator in various treatment approaches, particularly so in the case of hypnotic interventions (Spanos & Chaves, 1989). Imagery-based pain management strategies have been found efficacious for the treatment of headache of varying types (Brown, 1984; Nolan, 1989). This type

of approach has been shown to be equally effective with or without an accompanying hypnotic induction procedure for the treatment of various chronic pain syndromes (Stam, McGrath, & Brooke, 1984; Nolan, 1989). The present study investigated the effect of both hypnotic and nonhypnotic imagery-based training on the management of recurrent headache pain.

Headache pain has been acknowledged as being a widespread problem amongst the general populace. Prevalence rates for persons having at least 1 headache per year have been reported to range from 15%-30% for women and 7.5%-15% for men (Leviton, 1978; Dupuy, Engel, Devine, Scanlon & Querec, 1977; Markush, Karp, Heyman, & O'Fallon, 1975). Andrasik, Holroyd, & Abell (1979) found that within university populations prevalence rates were even higher, 13.1% of males and 25.4% of females reported having at least 3-4 headaches per week.

The two major headache types distinguished by the American Medical Association (Ad Hoc Committee on Classification of Headache, 1962) are Chronic Migraine headaches (CMH) and Chronic Tension headaches (CTH). CMH is described as a throbbing, unilateral pain in the temporal, orbital, or occipital areas of the head. Some of the comorbid symptomology associated with CMH include nausea, diarrhea, and pre-headache symptoms such as flashing lights in the visual field and dizziness. On the other hand, CTH's are characterized by a bilateral, bandlike ache that is typically manifested in the suboccipital area of the head. It has been associated with contraction of skeletal muscles

(particularly the frontalis muscle) (Ad Hoc Committee, 1962). CMH is thus primarily distinguished conceptually via its vasodilation/vasoconstriction component and CTH by its muscular component. If features of both CMH and CTH are present a classification of mixed headache is justified.

Whether or not Migraine and Tension headaches are empirically distinct phenomenon has been a cause for debate recently. It has been suggested that headache types differ only in terms of pain severity (Bakal, 1982). From this perspective headache types are differentiated simply via a continuum ranging from low to high pain severity, with CMH towards the higher end of the continuum as compared to CTH (Bakal, 1982). Indirect support for this stance is derived from studies indicating that CMH and CTH are indistinguishable in terms of physiological processes (see Flor & Turk, 1989 for a review). Flor & Turk (1989) in a review of the literature concluded that there was no evidence for symptom-specific responding (i.e., elevated baseline EMG levels) for tension headache sufferers vis-a-vis headache-free populations. Similarly, migraine sufferers did not differ in terms of an increased vasoconstriction or increased vasodilation component at baseline vis-a-vis headache-free populations.

Stress has been implicated as a potential factor in the maintenance of headache activity (Bakal, 1982). Initially, the notion that CMH and CTH were end products of a faulty reaction mechanism to life stress enjoyed widespread popularity (see

Merskey, 1986). There exists a substantial consensus amongst clinicians to this end. However, the evidence for such an assertion is in the main predominantly anecdotal (e.g., Henryk-Gutt & Rees, 1973; Wolff, 1937; Ziegler, 1979). The notion that headache activity is precipitated by stressors (within a same day period) has not been empirically confirmed (Bakal, Demjen, & Kaganov, 1981). Additionally, no appreciable difference has been found between headache and headache-free populations in terms of the amount of stress they encounter (Levor, Cohen, Naliboff, & McArthur, 1986). Nevertheless, Levor et al., employing a prospective design, reported significant elevations of stressful events over the 4 days leading up to and including a headache day as compared to a headache-free day. In a sense, the Levor et al. (1986) study supported a distal stressor-headache causal relationship rather than a proximal stressor-headache causal relationship. However, this support should be interpreted with caution as the study did not employ a control group.

As mentioned previously, one of the non-pharmacological treatments employed for the management of recurrent headache is that of imagery, more precisely Response-Based Imagery. This approach requires that subjects become imaginatively immersed in a fantasy scene while including within the scene their own imagined physical responses (see Nolan, 1989). This approach has been found to be effective in terms of reducing reports of headache pain relative to a placebo control group (Brown, 1984). Support for the efficacy of positive imagery as an effective tool

for the relief of acute clinical pain has been obtained by other researchers as well (e.g., Raft, Smith, & Warren, 1986; Nolan, Hayward, Scott, & Spanos 1989).

Treatment of recurrent headache pain has also been attempted with hypnotic interventions. The majority of studies investigating the efficacy of hypnotherapy have rarely compared a hypnotic strategy to a placebo (or control condition) and a cognitive-behavioral condition simultaneously. For the most part, available studies employing hypnosis for the management of clinical pain have been found to lack methodological rigor (for a review see, Spanos, 1991). In fact, such studies have been described by certain reviewers as "appallingly poor" (Turner & Chapman, 1982). Perhaps the principle limiting methodologic drawback of these investigations is that the majority consist of anecdotal reports and uncontrolled studies.

Results from anecdotal hypnosis studies are misleading in that it could be erroneously assumed that hypnosis results in unique outcomes and that it is in some form more effectual than nonhypnotic therapies. In reality, reviews of both controlled and uncontrolled studies investigating the efficacy of hypnotherapy on headache populations have reported hypnosis to be as effective but no more effective than cognitive-behavioral treatments, biofeedback and relaxation training regimes (Spinhoven, 1988; Wadden & Anderton, 1982). Moreover, it has been suggested that hypnotic interventions are simply hypnotic induction procedures combined with varied cognitive coping

strategies (Stam, McGrath, & Brooke, 1984; Spanos & Chaves, 1989). For example, some or all of the following cognitive coping strategies are typically employed concomitantly with hypnotic induction procedures: i) suggestions for analgesia ii) suggestions for relaxation iii) cognitive reinterpretation of noxious pain stimuli iv) distraction strategies and v) suggestions for the use of imaginal strategies. In view of this what is needed to discern the role of hypnotic induction procedures is a methodology whereby the effects of hypnotic procedures and cognitive coping strategies can be separated (Spanos & Chaves, 1989). This can be achieved by maintaining constant the cognitive coping components employed in both cognitive strategy conditions and hypnotic conditions.

To this end, Nolan (1989), in a study with headache sufferers compared hypnotic and nonhypnotic therapies sharing identical cognitive (i.e., imagery) components that differed only in terms of the presence or absence of an hypnotic induction procedure. Hypnotic and nonhypnotic treatments were found to be equally effective yet more effective than a no-treatment control condition. To this extent, the present investigation will be an extension of Nolan's (1989) study.

The amount of therapist contact in the treatment of vascular and tension headache (i.e., intensive contact versus minimal contact) has been demonstrated to be unrelated to the magnitude or the maintenance of headache reduction (Attanasio, Andrasik, & Blanchard, 1987; Blanchard, Appelbaum, Guarnieri, Neff, Andrasik,

& Jaccard, 1988; Scott, 1990). Attanasio et al. (1987) found that muscle contraction headache sufferers receiving eleven, five, or three sessions of cognitive therapy or relaxation training, did not differ in terms of headache reduction. Unfortunately, subjects receiving varying number of sessions also differed in terms of whether they received a relaxation treatment or a cognitive-imagery treatment. Thus, headache reduction may have been due to the efficacy of the particular treatment modality, rather than the degree of therapist contact. Blanchard et al. (1988) reported that vascular and tension headache sufferers receiving progressive muscle relaxation and biofeedback training, did not differ in terms of headache reduction relative to the differing degree of therapist contact that they received. In this experiment, subjects received either ten or three treatment sessions at a pain clinic over an eight week period. Finally, Scott (1990) reported that subjects receiving a response-based imagery treatment four times reduced their daily headache activity as much as subjects receiving the identical treatment only once. In light of these findings, the present study will employ a single-treatment session for each of the hypnotic and nonhypnotic treatment conditions.

As mentioned, it is commonly acknowledged that hypnotic and nonhypnotic interventions are equally efficacious in terms of producing reports of pain reduction. However, the issue of whether hypnotizability is an integral component in the success of hypnotic and nonhypnotic therapeutic interventions is

contentious. Some researchers (i.e., Spinhoven, 1988; Wadden & Anderton, 1982) argue that hypnotizability is a valid predictor of therapeutic outcome for both hypnotic and nonhypnotic treatments. They contend that hypnotizability is a stable trait which facilitates positive therapeutic outcomes. This stable trait is conceptualized as the ability to enter into a state of dissociation. Alternatively, other investigators (for a review see, Spanos, 1991) argue that hypnotizability is of no relevance to therapeutic outcomes. From this perspective, hypnotizability need not be conceived as a stable trait but as a constellation of similar attitudes, beliefs, expectations, and motivations. In other words, hypnotizability is parsimoniously conceptualized as being continuous with everyday social behavior. In a comprehensive review, Spanos (1991) concluded that taken together, existing empirical evidence fails to support the notion that hypnotizability is intrinsically related to therapeutic outcome (i.e., pain reduction) and rejects the hypothesis that "...large suggestion-induced reductions in pain are attainable only by highly hypnotizable subjects." (Spanos, 1991, p. 656).

A comprehensive meta-analytic review (i.e., Malone & Strube, 1988) reported that the advantage of psychological interventions with respect to pain management may reside in the reduction of the depression and anxiety that coexists with chronic pain, rather than actually relieving the pain itself directly. This inference was based on the observation that mood and number of psychological symptoms regularly display equal or better

responses to therapy than does pain intensity, pain duration, or frequency of pain. Along this line, Blanchard, Andrasik, Appelbaum, Evans, Myers, & Barron (1986) reported that across three studies on headache populations there were consistent significant reductions in depression and trait-anxiety associated with receiving treatment, regardless of treatment outcome.

As a result, the importance of using multi-outcome criterion measures rather than assessing only pain frequency and intensity is apparent. Besides examining pain outcomes, the present study will also attempt to examine the effects of treatment upon the psychological status of subjects (i.e., improvements in depression, anxiety, mood, and self-esteem).

An important consideration in the investigation of hypnotic and nonhypnotic analgesia is the role of compliance. It is apparent that verbal reports as indicators of pain can be easily biased by social demands. Since hypnotic and nonhypnotic suggestions for analgesia contain explicit demands calling for decrements in reported pain, it may be that these demands pressure subjects into reporting lower pain levels than they actually experience (Wagstaff, 1981). Recently Spanos, Perlini, Patrick, Bell, & Gwynn (1990) investigated the role of compliance in hypnotic and nonhypnotic analgesia. Their study employed a finger pressure device with the intent of assessing the degree to which subjects modified reports of pain reduction in the face of compliance-inducing instructions. Their results indicated significant correlations between reported pain reductions

produced by hypnotic and nonhypnotic analgesia suggestions and those produced by compliance instructions. Additionally, hypnotizability correlated positively with reported pain reductions produced both by compliance and by hypnotic analgesia conditions. The present investigation, assessed the role of compliance in the treatment of headache pain using the paradigm developed by Spanos, Perlini et al. (1990) for assessing compliance.

The actual compliance procedure (see Appendix G) employed in this study entails having subjects undergo three 60 second finger pressure trials. The first (baseline) trial is administered with no specific instructions while the second trial is preceded by the administration of a hypnotic or nonhypnotic analgesia suggestion (for treatment groups). The final trial begins with no specific instructions, but is followed up with compliance instructions just prior to when subjects are asked to recall their pain levels. These instructions are designed to pressure subjects into proffering reports of reduced pain.

The present study was designed to investigate the following hypotheses; i) that hypnotic and nonhypnotic treatment conditions produce equivalent pre to post-treatment reductions in pain, stress, medication intake, and psychological variables, ii) that the reductions produced by the hypnotic and the nonhypnotic treatments are significantly larger than those produced by a monitoring/control condition, iii) that treatment-related suggestions for analgesia (hypnotic and nonhypnotic) and

compliance suggestions for analgesia will reduce finger pressure pain, iv) that pain reductions produced on the finger pressure pain trials employing hypnotic or nonhypnotic analgesia suggestions and those produced by compliance instructions will be positively associated with decrements in pre to post-treatment headache activity for subjects in the treatment conditions, v) that pain reductions produced on the pain trials employing hypnotic or nonhypnotic analgesia suggestions and those produced by compliance instructions will be positively associated with each other, vi) that pain reductions produced on the pain trials employing treatment-related analgesia suggestions and those produced by compliance instructions will be positively associated with hypnotizability, and vii) it was also of interest to test the notion that hypnotizability is a significant predictor of therapeutic outcome (i.e., headache pain reduction) for both hypnotic and nonhypnotic treatments.

METHOD

Subjects

Participants were 78 undergraduate university students (17 males, 61 females) who were enrolled in the Introductory Psychology course at Carleton University. The subjects received experimental credits for their participation. All of the subjects who demonstrated the symptoms of Chronic Tension Headache, Migraine Headache, or a combination of both (Mixed) were selected. The sample was predominantly unmarried (94%), enrolled in their first year of university studies (83%), and undiagnosed by a physician for their headaches (69%). The mean age of the cohort was 20.5 years ($SD=5.03$), with a headache chronicity of 6.22 years ($SD=5.54$). The average annual family income of the sample was approximately \$56,000.

Apparatus

A strain gauge device modified from Forgione and Barber (1971) was used to produce localized finger pressure pain. The device consists of a 2300 gram weight attached to the end of a tapered wedge.

Procedure

A self-report screening questionnaire (Appendix A) was administered to approximately 1200 Carleton University undergraduate students. The questionnaire assessed symptoms of chronic tension headache and migraine headache. Individuals who satisfied the criteria for these headache types, as defined by Blanchard & Andrasik (1985) (Appendix B) were contacted by phone

and asked to participate. Individuals who reported headache related comorbid medical conditions were excluded from participation.

The first phase of the study after telephone recruitment involved a briefing session for all subjects outlining what was required of them in the study. During this phase subjects also completed a series of baseline questionnaires (Appendix H,I,J,K,L,M). During the briefing session subjects were informed that they would be required to attend a total of 3 experimental sessions and complete a 3 week baseline daily headache index followed by a 4 week followup. The nature of the treatment was described as a standardized pain coping strategy. Finally, the participants were informed of the nature of a pain perception task which they would be required to complete.

Following the initial phase of the study subjects were randomly assigned to one of three conditions: viz., Monitoring (no treatment control), Imagery, or Hypnosis. Each of the Imagery and Hypnosis conditions required that subjects attend a session wherein they listen to a standardized guided imagery audio tape (Appendix C). The only difference between Imagery and Hypnosis conditions was that the guided imagery tape for the Hypnosis condition was preceded by an hypnotic induction procedure. Subjects were also required to complete a scale measuring how vividly they experienced scenes within the imagery session (Appendix D). For three weeks before and 4 weeks after treatment subjects completed a daily headache diary assessing

headache activity (Appendix E).

After completion of headache diaries subjects completed a followup series of questionnaires identical to 3 of the baseline questionnaires (Appendix H,I,J) administered during the first phase of the study along with a rating scale (Appendix O) assessing the subjects' perceived efficacy of their respective treatments. Immediately following this, subjects completed a consent form (Appendix N) for a compliance task in which a finger pressure device was employed to assess compliance. Afterwards, subjects were recruited for testing on hypnotic susceptibility using the Carleton University Responsiveness to Suggestion Scale (CURSS; Spanos, Radtke, Hodgins, Stam & Bertrand, 1983) (Appendix F). For completion of the CURSS subjects were remunerated five dollars. Finally, all subjects were given a debriefing summary (Appendix P) outlining the purpose of the experiment.

Monitoring Condition

Subjects in this waiting list condition recorded their daily headache activity on a daily basis throughout the preliminary 3 week period and the 4 week followup period. They were told that treatment similar to that offered other conditions would be available to them upon completion of the study if they so desired.

Treatment Conditions

Imagery Condition

This condition consisted of 1 30 minute session of response based imagery training presented on an audio tape. Subjects were

asked to imaginatively participate twice in two separate 60 second fantasy scenes. For a final two more times they were asked to imagine anew any of the two possible scenes. Thus subjects engaged in a total of six 60 sec fantasy scenes (Appendix C). The tape also explained that the type of guided imagery training presented can be used to gain self-control over headache pain. The tape encouraged subjects to practice this technique at home in order to become more proficient at using it. As in the monitoring condition, subjects completed the preliminary and followup blocks of headache diaries.

Hypnosis Condition

The hypnosis condition was identical to the imagery condition in all respects except that it was preceeded by a 5 minute hypnotic induction procedure and concluded with a wakeup procedure. This session was approximately 35 minutes in length.

Finger Pressure Pain Trials

All subjects were exposed to three 60 sec trials of finger pressure pain. During each trial as well as for the ensuing 15 seconds, subjects were asked to keep their eyes closed. Pressure was produced by placing the subject's finger beneath the tapered wedge of the pressure device. The wedge was lowered upon the first phalanx of either the index or middle digits. Half of the subjects received the first and third pressure stimulation trials upon the dominant hand and the second trial on the nondominant hand. The remaining subjects were administered the trials in the reverse order. Subjects were instructed to use either their

index or middle fingers; never using the same finger from the same hand twice. Fifteen seconds after the termination of each trial the subjects rated the level of discomfort that they experienced immediately before their finger was removed from the device using a 21-point category scale taken from Spanos, Kennedy, and Gwynn (1984). The scale ranges from 0 (no pain) to 20 (excruciating pain).

All subjects received instructions (Appendix G) preceeding the first trial that explained what would be required of them during the ensuing trials. Subjects in the imagery and hypnotic conditions received instructions preceeding the 2nd trial (Appendix G) encouraging them to employ the imagery or hypnotic skills they were taught during their treatments in order to reduce the discomfort they might experience. Finally, two-thirds of subjects in the treatment conditions received compliance instructions (Appendix G) during the 15 sec period following the third trial with the aim of eliciting compliance induced pain reductions.

Dependent Measures

Vividness of imagined scenes (Appendix D)

In both treatments subjects rated the degree to which they vividly imagined the scenes presented using a 7-point Likert rating scale. The scale ranges from--(1) "I did not imagine this at all. I was unable to get any of the images." to (7) "I imagined this very strongly, vividly and completely. The images filled my whole mind."

Headache rating index (Appendix E)

All subjects recorded the level of their headache intensity four times per day during the 3 week baseline phase and during the 4 week followup period. Headache intensity was rated according to a 6 point scale, ranging from "no headache" (0) to "extremely intense headache, incapacitating" (5) (Blanchard & Andrasik, 1985). The four headache ratings were averaged to yield a single daily headache activity score. Good levels of validity have been reported for this headache monitoring system (i.e., $r=.44$) (Blanchard, Andrasik, Neff, Jurish, & O'Keefe, 1981).

Frequency of medication usage, daily mood levels, and daily stress levels were also assessed within the context of the rating index. The mood scale asks, "How were your spirits today?" and ranges from "Extremely poor" (1) to "Extremely good" (7). The stress scale asks, "How much stress did you experience today?" and ranges from "None" (0) to "Very much" (6).

Carleton University Responsiveness to Suggestion Scale (Appendix F)

Hypnotizability was assessed using the Carleton University Responsiveness to Suggestion Scale (CURSS; Spanos, Radtke, Hodgins, Stam, & Bertrand, 1983). The CURSS yields three dimensions all derived from 7 items. The Objective scale (CURSS:O) ranges from 0 to 7 and assesses the number of behavioral responses which subjects report carrying out. The Subjective dimensions of the scale (CURSS:S1) and (CURSS:S2)

range from 0 to 21 and assess how vividly the subjects experienced the suggestions. The Objective-Involuntary scale (CURSS:OI) assesses the number of suggested responses that subjects experienced as primarily involuntary. Satisfactory reliability levels for the three dimensions of the CURSS have been reported (see Spanos, Cobb, & Gwynn, 1984; Spanos, Radtke, Hodgins, Bertrand, Stam, & Dubreuil, 1983).

Middlesex Hospital Questionnaire (Appendix H)

Participants were required to complete the Middlesex Hospital Questionnaire (MHQ; Crown, S., & Crisp, A.H., 1966) once at the beginning of the baseline period and once after the followup period. The depression and free floating anxiety subscales of the MHQ were employed in order to ascertain whether any posttreatment reductions in depression and anxiety occurred. Satisfactory reliability levels have been reported for both subscales (see Crown, S., & Crisp, A.H., 1966).

Hassles Scale (Appendix I)

The revised version of the original Hassles Scale (HS; Kanner, Coyne, Schaefer, & Lazarus, 1981) was administered to all participants at baseline and after the followup period (see DeLongis, Folkman, & Lazarus, 1988, for a discussion of revised scale). The revised scale consists of 53 items in which subjects rate each item on how much of a hassle it was for them within the past month along a 3-point scale ranging from "somewhat severe" (1) to "extremely severe" (3). Good reliability levels have been reported (see DeLongis et al., 1988)

Rosenberg Self-Esteem Scale (Appendix J)

Subjects completed the Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1979) once at the beginning of the baseline period and again immediately after the followup phase. The 10-item RSE assesses positive affective functioning and has yielded high levels of reliability (see Rosenberg, 1979).

Perceived treatment efficacy ratings (Appendix O)

Upon completion of the study subjects from the treatment conditions completed an 8-point Likert scale gauging how effective they perceived their treatment as being in terms of reducing their headache pain. The scale asks, "How effective do you believe your treatment was in terms of reducing your headache pain?" and ranges along a scale beginning at (0) "not effective" and ending at (7) "very effective".

RESULTS

Repeated Measures Analyses: Condition X Dependent Measures

All subjects completed a daily index diary which assessed their daily levels of; headache intensity, frequency of medication intake, mood levels, and stress levels. Initially, these assessments were divided into baseline (3-week) and post-treatment (4-week) blocks. However, for the sake of the statistical analysis, the post-treatment block was later divided into two 2-week blocks (i.e., post 1 and post 2). This was done in order to better delineate the nature of the post-treatment repeated measures variables obtained from the *daily index card*. A mean score for all of the aforementioned four variables was computed for each of the baseline, post 1, and post 2 blocks. Additionally, all subjects completed baseline and post-treatment questionnaires which assessed levels of: anxiety, depression, self-esteem, and monthly stress (Hassles).

A series of Oneway Analyses of Variance procedures were conducted on all of the *baseline* scores in order to screen for potential pre-treatment differences among the between-group conditions [i.e., Control (N=20), Imagery (N=27), and Hypnosis (N=31)]. A summary of the Oneway ANOVA procedures is given in table 1.

Table 1

Comparisons of Mean Baseline Scores by Condition

Baseline Measure	<u>Between-Group Conditions</u>					
	<u>Control</u>		<u>Imagery</u>		<u>Hypnosis</u>	
	<u>M</u>	<u>(SD)</u>	<u>M</u>	<u>(SD)</u>	<u>M</u>	<u>(SD)</u>
Headache Pain	1.292	(.663)	1.175	(.710)	.985	(.648)
Medication Intake	.242	(.143)	.371	(.375)	.316	(.415)
Daily Stress	2.85 _a	(.687)	2.33 _a	(.710)	2.462	(.740)
Mood	4.579	(.729)	4.318	(.656)	4.298	(.592)
Self-Esteem	30.35	(4.511)	29.423	(5.262)	30.321	(5.019)
Anxiety	8.0	(3.784)	9.0	(3.418)	7.448	(3.225)
Depression	5.4	(2.563)	5.923 _b	(3.486)	3.897 _b	(2.907)
Hassles	31.95	(17.512)	28.615	(16.231)	25.586	(17.512)

Note: Means sharing a common subscript differ significantly at a $p = .05$.

Results indicated significant differences between the imagery and hypnosis conditions on the depression scores, and significant differences between the control and imagery conditions on the daily stress mean scores. As a result of the baseline differences on depression and daily stress, the baseline scores were treated as covariates when analysing these variables.

Stress: A 3 (Control/Imagery/Hypnosis) X 2 (Post1/Post 2) Mixed Analysis of Covariance (ANCOVA) was performed on the mean daily stress scores, using baseline scores as a covariate. Results presented in Table 2 indicate that neither the interaction nor the main effect attained significance. In other words, subjects in the 3 conditions did not significantly differ in stress and did not decrease their stress levels across trials. The means involved in this analysis, and all other repeated measures analyses, are given in tables 3 and 4.

Table 2

Mixed ANCOVA Summary Table for Daily Stress:

Conditions X (Post 1 and Post 2) with Baseline as Covariate

Source	<u>df</u>	<u>F</u>	<u>p</u>
Trials	(1,60)	3.82	ns
Condition X Trials	(2,60)	2.49	ns

Note: ns= $p > .05$.

Table 3

Means for Post 1 Measures by Condition

Post 1	<u>Between-Group Conditions</u>					
	<u>Control</u>		<u>Imagery</u>		<u>Hypnosis</u>	
	<u>M</u>	<u>(SD)</u>	<u>M</u>	<u>(SD)</u>	<u>M</u>	<u>(SD)</u>
Headache Pain	1.141	(.709)	.997	(.647)	.947	(.808)
Medication Intake	.221	(.167)	.225	(.160)	.284	(.366)
Daily Stress	2.651	(.853)	2.348	(.970)	2.667	(1.062)
Mood	4.497	(.987)	4.602	(.874)	4.214	(.664)
Self-Esteem	31.35	(5.214)	30.346	(4.166)	30.179	(4.651)
Anxiety	7.4	(3.530)	8.731	(3.853)	7.241	(4.206)
Depression	4.650	(2.498)	5.846	(3.552)	4.448	(3.355)
Hassles	27.45	(10.206)	27.077	(14.516)	22.241	(12.153)

Table 4

Means for Post 2 Measures by Condition

Post 2	<u>Between-Group Conditions</u>					
	<u>Control</u>		<u>Imagery</u>		<u>Hypnosis</u>	
	<u>M</u>	<u>(SD)</u>	<u>M</u>	<u>(SD)</u>	<u>M</u>	<u>(SD)</u>
Headache Pain	1.148	(.568)	.736	(.638)	.965	(.846)
Medication Intake	.313	(.266)	.200	(.275)	.279	(.480)
Daily Stress	3.432	(.837)	2.284	(1.028)	2.806	(1.263)
Mood	4.349	(1.245)	4.652	(1.068)	4.236	(.716)

Depression: A oneway (Control/Imagery/Hypnosis) Analysis of Covariance (ANCOVA) was performed on followup depression scores, while treating the baseline scores as a covariate. Once again the main effect failed to reach significance, $F(2,74) = 1.346$, $p > .05$, indicating that there existed no significant differences between conditions on followup depression, when baseline depression scores were partialled out.

Mood, Medication Intake, Headache Pain: The remainder of the daily dependent measures displayed no baseline differences by condition and were entered into separate 3 (Control/Imagery/Hypnosis) X 3 (Baseline/Post 1/Post 2) Mixed Analyses of Variance (ANOVA). Table 5 presents the ANOVA results for daily headache pain, daily medication intake, and daily mood.

The means employed in these analyses are presented in tables 1, 3, and 4. The analyses on both medication intake and mood failed to yield significant main effects or significant Condition X Trial interactions. However, a significant main effect and 2-way interaction were attained for daily headache pain. These effects indicated that headache pain decreased across trials, and that not all groups displayed equivalent reductions.

Table 5

Mixed ANOVA Summary Table for Daily Headache Pain, Daily Medication Intake, and Daily Mood: Conditions X Trials

Source	df	F	p
<u>Dependent Measure</u>			
<u>Mood</u>			
Trials	(2,120)	.08	ns
Condition X Trials	(4,120)	1.58	ns
<u>Medication Intake</u>			
Trials	(2,132)	1.80	ns
Condition X Trials	(4,132)	1.91	ns
<u>Headache Pain</u>			
Trials	(2,132)	6.53	.002
Condition X Trials	(4,132)	3.26	.014

Note: ns= $p > .05$.

Given the significant interaction on daily headache pain

(see Table 5), an analysis of the simple effects was carried out. These simple effects were computed in the manner recommended by Howell (1982). Results indicated (see table 6) that the only overall F to attain significance for the between-group effect occurred at Post 2, neither of the between-group effects at Baseline or Post 1 were significant. The only overall F for the within-group effect to reach significance was that involving the Imagery condition (see table 6). In this condition a monotonic decrease in pain ratings was evident over trials. Neither the Control nor Hypnosis within-group effects were significant. Figure 1 depicts the mean headache pain ratings involved in this analysis for subjects in the 3 conditions across the 3 trials.

Table 6

Analysis of Between-Group and Within-Group Simple Effects for
Headache Pain

Source	df	F	p
<u>Between-Group</u>			
Condition at Baseline	(2,87)	2.801	ns
Condition at Post 1	(2,87)	0.748	ns
Condition at Post 2	(2,87)	3.35	<.05
<u>Within-Group</u>			
Control across Trials	(2,132)	1.09	ns
Imagery across Trials	(2,132)	12.185	<.05
Hypnosis across Trials	(2,132)	0.105	ns

Note: ns= $p < .05$.

Figure 1: Mean headache pain ratings for three conditions across trials. Only the overall F 's for the between-group effect at Post 2, and the within-group effect for the Imagery condition were significant at $p < .05$.

MEAN HEADACHE RATINGS

Effect of Treatments Over Trials

As a result of the significant overall F 's, a series of Fisher's LSD post-hoc tests were conducted to determine which means within these significant effects differed from one another. Table 7 indicates that all of the possible comparisons among means, within the between-group effect, failed to differ significantly from each other. However, the largest difference within this effect (i.e, Control - Imagery) did approach significance (obtained $t = 1.78$, critical $t = 2.021$). On the other hand, comparisons among means for the within-group effect indicated significantly lower reported pain on Post 2 than on Baseline ($t = 4.910$, $p < .05.$), and significantly lower pain on Post 2 than Post 1 ($t = 2.919$, $p < .05.$). No other differences attained significance.

Table 7

Fisher's LSD Post Hoc Comparisons of Headache Pain Means at
i) Imagery Group across Trials and, ii) Conditions at Post 2

	<u>M</u>	<u>(SD)</u>
<u>Trials a Imagery Group (N=25)</u>		
Baseline	1.175 _a	(.710)
Post 1	.997 _b	(.647)
Post 2	.736 _{ab}	(.638)
<u>Conditions at Post 2</u>		
Control (N=15)	1.148	(.568)
Imagery (N=25)	.736	(.638)
Hypnosis (N=29)	.965	(.846)

Note: All means sharing common subscripts differ significantly at
 $p < .05$.

The remainder of the repeated dependent measures that were not recorded on a daily basis and that did not differ by condition at baseline were analysed in a 3 (Control/Imagery/Hypnosis) X 2 (Baseline/Post 1) Mixed Analysis of Variance (ANOVA). Table 8 presents the ANOVA results for the following dependent measures: anxiety, self-esteem, and monthly stress (Hassles). All main effects and Condition X Trials interactions were observed to be non-significant. This indicated that the groups did not differ significantly across trials, and that the between-group condition was not dependent upon the level of the repeated measure (trials).

Table 8

Mixed ANOVA Summary Table for Anxiety, Self-Esteem, and Hassles:
Conditions X Trials

Source	df	F	p
<u>Dependent Measure</u>			
<u>Anxiety</u>			
Trials	(1,72)	.95	ns
Condition X Trials	(2,72)	.10	ns
<u>Self-Esteem</u>			
Trials	(1,71)	2.58	ns
Condition X Trials	(2,71)	1.07	ns
<u>Hassles</u>			
Trials	(1,72)	3.50	ns
Condition X Trials	(2,72)	.25	ns

Note: ns= $p > .05$.

Finger Pressure Pain Trials Repeated Measures Analyses

All subjects completed three finger pressure pain trials, however, only the subjects receiving treatment (i.e., Imagery and Hypnosis) received treatment-related suggestions for analgesia and compliance instructions for analgesia. Differences between trial 1 and trial 3 reflect the effect of compliance instructions, while differences between trial 1 and trial 2 reflect potential effects of treatment-related suggestion instructions. In order to test the compliance effect a 2 (Between groups; Imagery/Hypnosis) X 2 (Between groups; Compliance/No Compliance) X 3 (Within groups; Baseline/Suggestion Trial/Compliance Trial) Mixed Analysis of Variance (ANOVA) was conducted. Table 9 presents the means tested in this analysis, while table 10 presents the ANOVA results. Neither the Trials, Compliance X Trials, Conditions X Trials, nor Compliance X Condition X Trials, effects attained significance. The nonsignificance of the Compliance X Trials interaction indicates that, the effect of whether compliance instructions were administered or not, was not dependent on the level of the trials factor. Surprisingly enough, inspection of means collapsed across the Imagery and Hypnosis conditions (see Figure 2), reveals that Compliance instructions (at Trial 3) led to an increase in pain as compared to Baseline, while the No Compliance condition led to a decrease in pain. Although these changes were small and nonsignificant, they were nonetheless, completely opposite to what was hypothesized.

Table 9

Means involved in Finger Pressure Pain Trials for Compliance
Condition

Trials	Baseline		Trial 2		Trial 3	
	<u>M</u>	<u>(SD)</u>	<u>M</u>	<u>(SD)</u>	<u>M</u>	<u>(SD)</u>

Compliance (N=41)

Imagery	9.056	(3.670)	9.222	(3.457)	9.778	(4.545)
Hypnosis	9.435	(4.110)	8.696	(3.598)	9.043	(3.431)

No Compliance (N=17)

Imagery	13.0	(2.121)	11.889	(2.522)	12.0	(3.905)
Hypnosis	10.125	(3.441)	8.875	(2.588)	10.625	(5.263)

Note: Within the Compliance conditions, N=18 for Imagery group, and N=23 for Hypnosis group. Within the No Compliance condition, N=9 for the Imagery group, and N=8 for the Hypnosis group.

Table 10

Mixed ANOVA Summary Table for Finger Pressure Pain Ratings:
Compliance X Trials, Conditions X Trials,
& Compliance X Condition X Trials

Source	<u>df</u>	<u>F</u>	<u>p</u>
Trials	(2,108)	1.57	ns
Compliance X Trials	(2,108)	.46	ns
Conditions X Trials	(2,108)	.32	ns
Compliance X Condition X Trials	(2,108)	1.05	ns

Note: ns= $p > .05$.

Figure 2: Figure 2 illustrates mean finger pressure pain ratings across trials (i.e., baseline [trial 1], treatment-related analgesia suggestion [trial 2], and compliance analgesia suggestion [trial 3]) for Compliance (N=41) and No Compliance (N=17) groups, collapsed across the Imagery and Hypnosis conditions. Both the trials main effect and the Compliance X Trials interaction failed to attain significance at $p = .05$.

MEAN FINGER PRESSURE PAIN

Effects of Suggestions Over Trials

Analysis of Treatment-Induced Finger Pressure Pain Decrements:
Conditions X Trials

In order to test whether the suggestions for analgesia presented to the treatment conditions were effective at reducing pain reports vis-a-vis the Control condition, a 2 (Between-group; Treatment/Control) X 3 (Within-group; Trial 1/Trial 2/Trial 3) Mixed (ANOVA) was conducted on the finger pressure pain scores. For the sake of this analysis, hypnotic and nonhypnotic treatment conditions were collapsed into a single condition, given that the two treatments did not differ significantly from each other in terms of the mean pain change scores from Trial 1 to Trial 2 (Imagery, $M=.26$; Hypnosis, $M=.87$)-- $t(75) = .688$, ns. Mixed ANOVA results yielded a significant Conditions X Trials interaction-- $F(2,152) = 3.50$, $p < .05$., and a nonsignificant Trials main effect-- $F(2,152) = 2.17$, $p > .05$.. Analysis of the simple effects yielded a significant overall F for the between-group effect at Trial 2-- $F(1,133) = 7.17$, $p < .05$., and Trial 3-- $F(1,133) = 5.774$, $p < .05$., but not Trial 1 ($F(1,133) = .245$, ns. This indicated higher mean pain for the subjects in the Control condition relative to the Treatment condition, after the administration of the analgesia suggestion. Additionally, a significant within-group effect for the Control condition-- $F(2,152) = 3.428$, $p < .05$., but not the Treatment condition-- $F(2,152) = 1.124$, ns., indicated that pain increased significantly over trials for the Control group, and decreased over trials for the Treatment condition, albeit nonsignificantly. Table 11

presents the means involved in this analysis. Followup post hoc tests of all possible comparisons among the within-effect means for the Control condition revealed significant differences between Trial 1 and Trial 2-- $t = 2.045$, $p < .05$., and between Trial 1 and Trial 3-- $t = 2.441$, $p < .05$. These results indicated that suggestions for analgesia involving treatment-related imagery were successful at preventing reports of increased finger pressure pain, significantly more so than when no treatment-related suggestions were available.

Table 11

Comparison of Finger Pressure Pain Means at i) Control Condition Across Trials, and ii) Conditions at Trials

Trials	Baseline		Trial 2		Trial 3	
	<u>M</u>	(<u>SD</u>)	<u>M</u>	(<u>SD</u>)	<u>M</u>	(<u>SD</u>)
<u>Control (N=20)</u>	_{ab} 10.45	(3.395)	_{ac} 12.0	(3.756)	_{bd} 12.3	(3.935)
<u>Treatment (N=58)</u>	9.966	(3.802)	_c 9.379	(3.392)	_d 9.948	(4.161)

Note: Means within columns and between rows sharing common subscripts differ significantly at $p < .05$.

Correlational Analyses

A series of Pearson product moment correlations were conducted in order to test the hypotheses that; a positive

relationship would exist between decrements in pre to post-treatment headache activity for subjects in the treatment conditions and pain reductions produced on the finger pressure pain trials by, i) suggestions for analgesia involving treatment-related imagery and by, ii) compliance instructions. Change scores were used to assess decrements in pre to post-treatment headache activity. Table 12 presents the results of the above correlations.

Table 12

Pearson r's for Relation Between Headache Pain Change Scores and Finger Pressure Pain Decrements Elicited by Suggestions for Analgesia and Compliance Analgesia Suggestions

	Headache Pain Change Score
Analgesia Suggestion	$r = .1174$ ($N = 37$)
Compliance Suggestion	$r = -.0927$ ($N = 37$)

Note: All correlations fail to attain significance at $p = .05$. All tests of significance are two-tailed.

As can be seen, both potential relationships are statistically nonsignificant. This indicates that decrements in finger pressure pain elicited by treatment-related suggestions for analgesia and by the compliance instruction were not related to headache pain reductions for subjects in the treatment conditions.

Additionally, it was of interest to test the hypothesis that a positive association should exist between decrements in finger pressure pain elicited by treatment-related suggestions for analgesia and decrements induced by compliance-related suggestions for analgesia. Results indicated a strong relationship -- $r = .7433$ ($N = 41$), $p < .001$. Thus, compliance did seem to play a significant role in the reduction of finger pressure pain for subjects for whom treatment-related analgesia suggestions proved successful.

Hypnotizability and Pain Reductions

It was hypothesized that a positive correlation would exist between hypnotizability and finger pressure pain reductions elicited via treatment and compliance analgesia suggestions. This was based on the premise that the connection between hypnotizability testing and analgesia suggestions during finger pressure trials was easily perceivable to the subjects, given that both sessions were administered within the context of the same study. That is, subjects were expected to make the connection, that both sessions were related to each other. Table 13 presents the results of a series of correlations assessing the above relations.

Table 13

Intercorrelations Between Hypnotizability and Finger Pressure Pain Decrements Elicited via Treatment-Related Suggestions for Analgesia (N=37) and Compliance-Related Suggestions for Analgesia (N=37)

Pain Decrements Elicited via Suggestions	<u>Hypnotizability Measures</u>		
	CURSS:O	CURSS:S1	CURSS:OI
Analgesia Suggestion	r = .2003	r = .4444*	r = .1541
Compliance Suggestion	r = .1097	r = .2281	r = .2070

Note: All tests of significance are two-tailed. CURSS = Carleton University Responsiveness to Suggestion Scale, CURSS:O = overt responses to suggestions; CURSS:S1 = subjective experience of suggested effects, and CURSS:OI = overt-involuntary responses to suggestions.

*p < .01.

As the aforementioned correlations indicate, CURSS:S1 was the only hypnotizability measure to correlate with either of the suggestions, namely, the treatment-related suggestion for analgesia. It was, however, of interest to determine whether the above correlation would stand once the variance due to the compliance suggestion was controlled for. Consequently, a

partial correlation was conducted between finger pressure pain decrements elicited via the treatment-related suggestion for analgesia and CURSS:S1, with the compliance factor statistically partialled out. Results indicated that the correlation remained significant ($r = .4301$, $p < .05$., $N = 37$). This indicates that compliance did not play a role in the association between treatment-induced pain decrements and hypnotizability.

Additionally, a series of correlations were conducted to test the notion that treatment-induced headache pain reductions are positively associated with hypnotizability. Table 14 presents the results of the correlational analysis.

Table 14

Intercorrelations Between Treatment-Induced Headache Pain
Decrement and Hypnotizability (N=47)

	<u>Hypnotizability Measures</u>		
	CURSS:O	CURSS:S1	CURSS:OI
Treatment-Induced			
Headache Pain	$r = -.0740$	$r = -.0170$	$r = -.3174*$
Change Score			

Note: All tests of significance are two-tailed. CURSS acronyms similar to Table 12. $*p < .01$.

The only correlation to attain significance involved the relation between CURSS:OI and headache pain decrements. This negative correlation indicated that subjects in the treatment conditions who reported high pain decrements tended to be low in hypnotizability.

DISCUSSION

The principle finding of this study supported the efficacy of response-based imagery training as an effective headache pain management technique for a university population. This was true for the nonhypnotic-imagery group but not the hypnotic-imagery group. Moreover, results indicated that this reduction within the imagery condition could not be attributed to a significant decrease in medication consumption. Despite this significant reduction, there were no significant differences between any of the between-group conditions on headache pain at followup.

The expectation that psychologic variables would display significant pre to post-treatment improvements as a result of therapeutic intervention, an expectation that has been well grounded in empirical evidence (see Malone & Strube, 1988), was not supported by this study's data. Not one of the psychological variables displayed any significant trends whatsoever. Self-esteem, depression, and daily stress failed to improve consistently over Trials. Anxiety and Hassles (monthly stress) decreased for all conditions over Trials, albeit to a nonsignificant degree, regardless of whether treatment was received or not. Mood displayed a consistent but small improvement over Trials for the imagery condition, but once again, this trend did not attain significance. The general failure of the psychological variables to react to treatment intervention could well be attributed to minimal experimenter/subject contact. Alternatively, support was lent

for the efficacy of nonhypnotic response-based imagery training as an effective headache pain management technique. This was consistent with other investigations, where imagery-training has been found to be an effective pain management approach (Brown, 1984; Nolan, 1989).

The second principle finding of this study involved the role of treatment-related imagery suggestions and compliance suggestions for analgesia in the reduction of finger pressure pain. Results indicated that, on the whole, compliance instructions were ineffective, compared to a no compliance condition, in terms of eliciting finger pressure pain reductions. Interestingly enough, compliance instructions led to a slight increase in reported pain, whereas, no compliance instructions led to a slight decrease in pain. This was of course, contrary to what was expected and contrary to what has been found in previous studies (e.g., Spanos et al., 1990). On the other hand, treatment-related analgesia suggestions employing imagery were effective, vis-a-vis no-treatment conditions, in terms of preventing an increase in reported finger pain. Within the treatment suggestion conditions, the hypnotic imagery group did not differ from the nonhypnotic imagery condition, but when combined, treatment conditions did differ from the control condition. This is consistent with empirical evidence involving induced pain, whereby hypnotic and nonhypnotic conditions are found to be equally effective yet more effective than no-treatment control conditions (see Spanos, 1989, for a review).

Spanos et al., (1990) found that their compliance procedure was effective only for high hypnotizable subjects. The general ineffectiveness of the compliance procedure in the present study could be explained in terms of the relatively small number of high hypnotizables as compared to low hypnotizables in the sample.

Correlational analyses revealed that compliance suggestions and treatment-related suggestions were unrelated to treatment-induced headache pain reductions. This result, did not support the notion that compliance may have played a role in the reduction of headache activity, and consequently, further supports the efficacy of imagery-training as an effective pain management modality for a university based sample of recurrent headache sufferers.

Despite the general ineffectiveness of the compliance instructions at reducing finger pain, and despite the inability of compliance-induced finger pain change to predict headache pain reduction, it was nonetheless found that compliance-related finger pain decrements correlated highly with treatment-related finger pain decrements. In other words, subjects who reduced their finger pain via treatment-related suggestions, also generally experienced pain decrements through compliance suggestions. Thus, compliance did appear to play a significant role in the reduction of finger pressure pain for subjects whose treatment-related analgesia suggestions proved successful. The aforementioned finding has also been reported by Spanos et al.,

(1990).

Additionally, Spanos et al., also reported that hypnotizability correlated with pain decrements elicited by hypnotic analgesia suggestions as highly as it correlated with compliance-induced pain decrements. The present study, partially replicated the preceding finding, in that pain decrements produced by combined hypnotic and nonhypnotic analgesia suggestions correlated with hypnotizability. Even when the variance due to the compliance suggestion was partialled out of the relationship, the correlation remained significant. In contrast to Spanos et al.'s study, compliance-induced pain decrements were not observed to correlate with hypnotic susceptibility. The significant relationship between treatment-induced pain decrements and hypnotizability in this study can be attributed to the explicit connection between hypnotic testing and the finger pressure trials testing. Given that both testing sessions were administered within the context of the same study, and that both sessions were typically conducted on the same day, subjects were thus expected to make the assumption that both sessions were related. Thus, this relationship may well have been an artifact of the explicit contextual connections that were available to subjects. Given the explicit connections between both sessions, the relationship between susceptibility and treatment-induced finger pain decrements does not necessarily support the notion that hypnotizability is intrinsically related to the efficacy of nonhypnotic and hypnotic analgesia. The

influence of such contextual factors in terms of modifying such a relationship has been reported by Spanos (1989).

Along a similar line, it was also of interest to test the notion that treatment-induced headache pain reductions are positively related to hypnotizability. Results from this study yielded a significant negative relationship. This indicated that subjects in the treatment conditions who reported high headache pain decrements tended to be hypnotically insusceptible. In this case, subjects could not readily make a connection between the hypnotic susceptibility testing and the treatment suggestions, as both testing sessions took place approximately 5 weeks apart. This finding contradicts the contentions held by some researchers (i.e., Spinhoven, 1988; Wadden & Anderton, 1982), who argue that hypnotizability is a significant predictor of positive therapeutic outcomes for both hypnotic and nonhypnotic treatments. Instead, this finding supports conclusions reached by Spanos (1991; see for a review), whereby it was asserted that existing empirical evidence failed to support the notion that hypnotizability is *intrinsically* related to positive therapeutic outcomes.

In summary, this study's findings reaffirmed the efficacy of nonhypnotic imagery-based training as a valid pain management technique for recurrent headache pain upon a university-based population. This efficacy could not be attributed to an improvement in psychological status, a decrease in medication intake, nor could it be attributed to a compliance factor.

Compliance, did however, appear to play a role in the reduction of induced finger pressure pain. With respect to hypnotic susceptibility, no support was lent towards the notion that hypnotizability is a significant predictor of treatment-induced headache pain reduction, however, hypnotizability was seen to be related to treatment-induced finger pressure pain reduction, although not necessarily intrinsically related.

In spite of the efficacy of the nonhypnotic imagery-based intervention for the reduction of reported headache pain, an important caveat concerns the generalizability of these results to a non-university based sample. This is so, given that the subjects employed in this study share common characteristics that make them untypical of the general population of headache sufferers. As compared to a typical recurrent headache population, the subjects in this sample in general were younger, of a higher socio-economic status, displayed a shorter headache chronicity, and were recruited for treatment - rather than having sought treatment. The latter factor is especially relevant, in that it engenders a unique cluster of motivations, expectations, and attitudes concerning the efficacy of treatment. By virtue of having actively sought treatment, patients are already self-selected for high motivation, as well as for positive expectations and attitudes regarding the efficacy of the intervention in question. In lieu of this, one need be cautious in terms of extrapolating the findings of this study to a recurrent headache population which seeks treatment. Instead,

the findings of this study provide a groundwork for investigating the efficacy of a brief one-session cognitive-behavioral intervention on a clinical headache population similar to that encountered at the medical practitioner's office.

References

- Ad Hoc Committee on Classification of Headache. (1962).
Classification of headache. Journal of the American Medical Association, 179, 717-718.
- Andrasik, F., Holroyd, K.A., & Abell, T. (1979). Prevalence of headache within a college student population: A preliminary analysis. Headache, 20, 384-387.
- Attanasio, V., Andrasik, F., & Blanchard, E.B. (1987). Cognitive therapy and relaxation training in muscle contraction headache: Efficacy and cost-effectiveness. Headache, 27, 254-260.
- Bakal, D.A. (1982). Psychobiology of chronic headache. New York: Springer.
- Bakal, D.A., Demjen, S., & Kaganov, J.A. (1981). Cognitive behavioral treatment of chronic headache. Headache, 21, 81-86.
- Blanchard, E.B. & Andrasik, F. (1985). Management of chronic headaches: A psychological approach. New York: Pergamon.
- Blanchard, E.B., Andrasik, F., Appelbaum, K.A., Evans, D.D., Myers, P., & Barron, K.D. (1986). Three studies of the psychologic changes in chronic headache patients associated with biofeedback and relaxation therapies. Psychosomatic Medicine, 48, 73-83.
- Blanchard, E.B., Andrasik, F., Neff, D.F., Jurish, S.E., & O'Keefe, D.M. (1981). Social validation of the headache diary. Behavior Therapy, 12, 711-715.

- Blanchard, E.B., Appelbaum, K.A., Guarnieri, P., Neff, D.F., Andrasik, F., & Jaccard, J., (1988). Two studies of the long-term follow-up of minimal therapist contact treatments of vascular and tension headache. Journal of Consulting & Clinical Psychology, 56, 427-732.
- Brown, J.M. (1984). Imagery coping strategies in the treatment of migraine. Pain, 18, 157-167.
- Crown, S. & Crisp, A.H. (1966). A short clinical diagnostic self-rating scale for psychoneurotic patients, British Journal of Psychiatry, 112, 917-923.
- DeLongis, A., Folkman, S., & Lazarus, R.S. (1988). The impact of daily stress on health and mood: Psychological and social resources as mediators. Journal of Personality and Social Psychology, 54, 486-495.
- Dupuy, H.J., Engel, a., Devine, B.K., Scanlon, J., & Querec, L. (1977). Selected Symptoms of Psychological Distress, U.S. Public Health Service Publication #1,000, Series 11, #37, National Center for Health Statistics.
- Flor, H. & Turk, D.C. (1989). Psychophysiology of chronic pain: Do chronic pain patients exhibit symptom-specific psychophysiological responses? Psychological Bulletin, 105, 215-259.
- Forgione, A.F. & Barber, T.X. (1971). A strain gauge pain stimulator. Psychophysiology, 8, 102-106.
- Henryk-Gutt, R. & Rees, W.L. (1973). Psychological aspects of migraine. Journal of Psychosomatic Research, 17, 141-153.

- Howell, D.C. (1982). Statistical Methods for Psychology. Boston: Prindle, Weber & Schmidt. (pp.378-382).
- Kanner, A.D., Coyne, J.C., Schaefer, C., & Lazarus, R.S. (1981). Comparisons of two models of stress measurement: Daily hassles and uplifts versus major life events. Journal of Behavioral Medicine, 4, 1-39.
- Leviton, A. (1978). Epidemiology of Headache. In B.S. Schoenberg (Ed.), Advances in Neurology (Vol. 19, pp. 341-352). New York: Raven Press.
- Levor, R.M., Cohen, M.J., Naliboff, B.D., McArthur, D., & Heuser, G. (1986). Psychosocial precursors and correlates of migraine headache. Journal of Consulting and Clinical Psychology, 54, 347-353.
- Litt, M.D. (1986). Mediating factors in non-medical treatment for migraine headache: Toward an interactional model. Journal of Psychosomatic Research, 30, 505-519.
- Malone, M.D. Strube, M.J. (1988). Meta-analysis of non-medical treatments for chronic pain. Pain, 34, 231-244.
- Markush, R.E., Karp, H.R., Heyman, A., & O'Fallon, W.M. (1975). Epidemiologic study of migraine symptoms in young women. Neurology, 25, 430-435.
- Merskey, H. (1980). The role of the psychiatrist in the investigation and treatment of chronic pain. Pain, 8, 249-260.
- Merskey, H. (Ed.). (1986). Classification of chronic pain: Descriptions of chronic syndromes and definitions of pain

terms. Pain (Supplement 3), S1-S225.

Nolan, R.P. (1989). The efficacy of hypnotic and non-hypnotic response-based imagery training for the self-management of recurrent headache. (Unpublished doctoral dissertation). Carleton University, Ottawa.

Nolan, R., Hayward, A., Scott, H.A., & Spanos, N.P. (1989). Hypnotic and nonhypnotic-based imagery strategies in the treatment of tension and mixed tension/migraine headache. (Unpublished Manuscript, Carleton University, Ottawa, Ontario).

Raft, D., Smith, R.H., & Warren, N. (1986). Selection of imagery in the relief of chronic and acute clinical pain. Journal of Psychosomatic Research, 30, 481-488.

Rosenberg, M. (1979). Conceiving the self. New York: Basic Books.

Scott, H.A. (1990). Hypnotic imagery, non-hypnotic imagery, and placebo in the treatment of recurrent headache. (unpublished master's thesis). Carleton University, Ottawa, Ontario.

Spanos, N.P. (1991). Hypnosis, Hypnotizability, and Hypnotherapy. In C.R. Snyder & D.R. Forsyth (Eds.). Handbook of social and clinical psychology: The health perspective. U.S.A.: Pergamon Press.

Spanos, N.P., & Chaves, J.F. (1989). Synopsis and suggestions for research. In N.P. Spanos & J.F. Chaves (Eds.). Hypnosis: The cognitive-behavioral perspective. Buffalo, N.Y.: Prometheus.

Spanos, N.P., Cobb, P., & Gwynn, M.I. (1984). The Carleton University Responsiveness to Suggestion Scale: Stability and

reliability under conditions of individual administration.

Psychological Reports, 54, 123-128.

Spanos, N.P., Kennedy, S.K., & Gwynn, M.I. (1984). The moderating effect of contextual variables on the relationship between hypnotic susceptibility and suggested analgesia. Journal of Abnormal Psychology, 93, 285-294.

Spanos, N.P., Perlini, A.H., Patrick, L., Bell, S., & Gwynn, M.I. (1990). The role of compliance in hypnotic and nonhypnotic analgesia. Journal of Research in Personality, 24, 433-453.

Spanos, N.P., Radtke, H.L., Hodgins, D.C., Bertrand, L.D., Stam, H.J., & Dubreuil, D.L. (1983). The Carleton University Responsiveness to Suggestion Scale: Stability, reliability, and relationships with expectancy and "hypnotic experiences". Psychological Reports, 53, 555-563.

Spanos, N.P., Radtke, H.L., Hodgins, D.C., Stam, H.J., & Bertrand, L.D. (1983). The Carleton University Responsiveness to Suggestion Scale: Normative data and psychometric properties. Psychological Reports, 53, 523-535.

Spinhoven, P. (1988). Similarities and dissimilarities in hypnotic and nonhypnotic procedures for headache control: A review. American Journal of Clinical Hypnosis, 30, 183-194.

Stam, H.J., McGrath, P.A., & Brooke, R.I. (1984). The effects of a cognitive-behavioral treatment program on temporomandibular pain and dysfunction syndrome. Psychosomatic Medicine, 46, 534-545.

Turner, J.A., & Chapman, C.R. (1982). Psychological interventions

for chronic pain: A critical review II. Operant conditioning, hypnosis and cognitive-behavioral therapy. Pain, 12, 23-46.

Wadden, T. & Anderton, C.H. (1982). The clinical use of hypnosis. Psychological Bulletin, 91, 215-243.

Wagstaff, G.F. (1981). Hypnosis and compliance and belief. New York: St. Martin's.

Wolff, H.G. (1937). Personality features and reactions of subjects with migraine. A.M.A. Archives of Neurology and Psychiatry, 37, 895-921.

Ziegler, D.K. (1979). Headache syndromes: Problems of definition. Psychosomatics, 20, 443-447.

NAME - _____

TEL #- _____

Headache History and Symptoms

1. How often do you experience headaches?

- ☐ one or less days per month
- ☐ two days per month
- ☐ one day per week
- ☐ two days per week
- ☐ more than two days per week

2. How long have you been experiencing headaches at the rate noted in the previous question?

- ☐ less than three months
- ☐ three to six months
- ☐ six months to one year
- ☐ one to two years
- ☐ two to five years
- ☐ more than five years

3. How would you rate the pain in your typical headache ?

- ☐ 5 Excruciating, incapacitating pain - the pain is so intense that you can do almost nothing
- ☐ 4 Horrible, severe pain - the pain makes concentration difficult, but you can do some undemanding tasks
- ☐ 3 Distressing pain - you are able to continue at your job or whatever you were doing
- ☐ 2 Discomforting pain - you are able to ignore the pain at times
- ☐ 1 Mild pain - you are able to be aware of this low level of pain only when your attention is devoted to it
- ☐ 0 No pain

4. What features characterize your typical headaches?Please indicate ALL of the features that apply to you.

- ☐ pain on both sides of head
- ☐ pain in the forehead area, though it may sometimes start at the back of the head or neck
- ☐ pain is a persistent and dull ache
- ☐ pain feels like a cap or band around head
- ☐ sensations of tightness or pressure accompany headache
- ☐ pain is only on one side of the head
- ☐ pain is a throbbing sensation
- ☐ one or more of the following signs precede or accompany headache - parts of visual field disappear temporarily, flashing lights, strange odors, tingling sensations
- ☐ nausea or vomiting usually accompanies headache
- ☐ sensitivity to light accompanies headache

MIGRAINE HEADACHE

Occurrence of at least one headache per month and the presence of three of the following:

- headache onset usually unilateral
- headache usually accompanied by nausea and vomiting
- headache usually described as throbbing or pulsating
- photophobia during headache
- one or more first-degree relatives diagnosed as migraine
- independent diagnosis of migraine (by a physician)
- headache usually preceded by visual changes

TENSION OR MUSCLE-CONTRACTION HEADACHE

Occurrence of at least three headaches per week and the presence of two of the following:

- headache usually described as bilateral and beginning in the occipital, suboccipital or back of the neck region
- headache described as usually feeling like a tightness or external pressure on head and/or like a 'cap' or 'band' around the head
- headache usually described as a continuing 'dull ache'
- independent diagnosis of muscle contraction headache

COMBINED MIGRAINE AND TENSION HEADACHE

Presence of both of the following:

- subject clearly identifies that she/he has two distinct types of headache
- subject meets criteria for both migraine and muscle-contraction headache

Protocol for Treatment Sessions

Hypnosis and Imagery Groups

Note: Given that the protocol for the Imagery and Hypnosis groups is essentially identical, distinctive features of the Hypnosis protocol will be noted by block letters.

We are going to teach you strategies that you can use to reduce the frequency and intensity of your headaches. Previous research has made it clear that stress is somehow related to headaches, and often a person's pain experience is increased by automatically engaging in a set of physical, emotional, and cognitive reactions to the headache. For example, when some people experience a headache coming on they might think to themselves such things as: "Oh God this is awful...I can't take this anymore...its never going to get better..." Thoughts like this actually increase the impact of the headache. These thoughts are commonly associated with feelings of being overly burdened with, or emotionally defeated by the headache. A cluster of physical symptoms also accompanies this reaction style. The symptoms are expressed in the form of tension in the skeletal muscles, increased heart rate, blood pressure, rate of breathing, and so on. This automatic reaction pattern can interfere with an individual's ability to carry out regular daily tasks. The result is that daily activities are experienced as being stressful, and this experience can further intensify headache activity. As you might expect, automatic reactions to headaches can take on many forms. However, numerous scientific studies have demonstrated that physical, emotional, and cognitive reactions to headaches can be significantly altered through therapies such as the one that you are about to learn.

The (Hypnotic) procedure you will be learning today has been used by physicians and psychologists to help people with a variety of pain syndromes, like back pain, arthritis, as well as headache.

PREVIOUS RESEARCH HAS DEMONSTRATED THAT YOUR ABILITY TO BE HYPNOTIZED DEPENDS ENTIRELY ON YOUR WILLINGNESS TO COOPERATE. IT HAS NOTHING TO DO WITH YOUR INTELLIGENCE. AS FOR YOUR WILL--POWER IF YOU WANT TO, YOU CAN PAY NO ATTENTION TO ME AND REMAIN AWAKE ALL THE TIME. ON THE OTHER HAND, IF YOU PAY CLOSE ATTENTION TO WHAT I SAY, AND FOLLOW THESE INSTRUCTIONS, YOU CAN EASILY LEARN TO FALL INTO A HYPNOTIC SLEEP. HYPNOSIS IS NOTHING FEARFUL OR MYSTERIOUS. IT IS MERELY A STATE OF STRONG INTEREST IN SOME PARTICULAR THING. IN A SENSE, YOU ARE HYPNOTIZED WHENEVER YOU SEE A GOOD SHOW AND FORGET YOU ARE PART OF THE AUDIENCE, BUT INSTEAD FEEL PART OF THE STORY. YOUR COOPERATION, YOUR INTEREST, IS WHAT I ASK FOR. YOUR ABILITY TO BE HYPNOTIZED IS A MEASURE OF YOUR WILLINGNESS TO COOPERATE. NOTHING WILL BE

DONE THAT WILL IN ANY WAY CAUSE YOU THE LEAST EMBARRASSMENT.

Visualization--vividly imagining scenes and events--are part of this treatment. I will soon ask you to practice visualizing some commonplace scenes (WITH THE AID OF HYPNOSIS). Remember, this procedure is like daydreaming, but I would like you to bring it more under your control (WITH THE AID OF HYPNOSIS), so that you can imagine specific events for a given period of time. First, find a position that is comfortable for you. As you are sitting there, I will ask you to visualize some scenes. Imagine these situations as vividly as you can. Involve yourself fully in the image. I want you to imaginatively participate in each scene that is presented. For example, in the first scene I will ask you to imagine lying on a beach. I want you to imagine how you really feel as you are lying on the beach in this scene. The idea of a vivid image is that you get the feeling of real, actual experience. You will hear the image described on tape. As you listen to the scene, create the image in your mind, doing exactly what you would do and feeling as you would feel in the real situation. When the description is finished, keep imagining the scene until I ask you to stop.

Please close your eyes.

NOW I'M GOING TO BEGIN THE HYPNOTIC PROCEDURE--BRIEF PAUSE. RELAX COMPLETELY. RELAX EVERY MUSCLE OF YOUR BODY. RELAX THE MUSCLES OF YOUR LEGS. RELAX THE MUSCLES IN YOUR ARMS. MAKE YOURSELF PERFECTLY COMFORTABLE. LET YOURSELF BE LIMP. RELAX MORE AND MORE; MORE AND MORE. RELAX COMPLETELY. RELAX COMPLETELY. RELAX COMPLETELY.

YOUR LEGS FEEL HEAVY AND LIMP, HEAVY AND LIMP. YOUR ARMS ARE HEAVY, HEAVY, HEAVY AS LEAD. YOUR WHOLE BODY FEELS HEAVY, HEAVIER, AND HEAVIER, YOU FEEL TIRED AND SLEEPY, TIRED AND SLEEPY. YOU FEEL DROWSY AND SLEEPY, DROWSY AND SLEEPY. YOUR BREATHING IS SLOW AND REGULAR, SLOW AND REGULAR.

YOU FEEL PLEASANTLY DROWSY AND SLEEPY AS YOU CONTINUE TO LISTEN TO MY VOICE. JUST KEEP YOUR THOUGHTS ON WHAT I AM SAYING. YOU ARE GOING TO GET MUCH MORE DROWSY AND SLEEPY. SOON YOU WILL BE DEEPLY ASLEEP BUT YOU WILL HAVE NO TROUBLE HEARING ME. YOU WILL NOT WAKE UP UNTIL I TELL YOU TO. AT EACH COUNT YOU WILL FEEL YOURSELF GOING DOWN, DOWN, DOWN INTO A DEEP, COMFORTABLE, A DEEP RESTFUL SLEEP. A SLEEP IN WHICH YOU WILL BE ABLE TO DO ALL SORTS OF THINGS I ASK YOU TO DO... (EXPERIMENTER COUNTS SLOWLY TO TEN).

YOU ARE FEELING COMFORTABLE AND RELAXED, COMFORTABLE AND RELAXED, AND YOU ARE IN A DEEP, SOUND SLEEP--A DEEP, SOUND SLEEP-- FULLY PREPARED TO RESPOND TO AND EXPERIENCE WHAT I WILL ASK YOU TO DO;...FULLY PREPARED TO RESPOND TO EACH OF THE SUGGESTIONS WHICH I WILL NOW GIVE YOU.

Make sure that you are seated comfortably. Relax. Let your

breathing take on a slow, deep, easy rhythm. Let any problems, worries, or concerns fade into the background. Let these fade away, more and more, every time you easily let out each breath.

I will now introduce the first imagined scene. Let the scene become as vivid as possible, and allow yourself to imaginatively participate in this scene. (Pause 10 seconds)

Response-Based Imagery Scene #1 (90 seconds)

You are lying on a beach near the ocean. You feel the hot sun on your skin. As you are lying in the sun you hear the ocean waves lapping onto the beach. Their rhythmic sound lulls you to a very quiet, almost drowsy state. You feel the tension draining away from your body. The muscles of your arms and hands feel so relaxed. Concentrate on the relaxation in your feet, legs, back your neck and head. The muscles are completely relaxed..., tension draining away...gone. The muscles in your face, around your eyes, mouth, the back of your head...so relaxed. Think about this feeling of relaxation. Any tension in your body is draining away. Your breathing becomes quiet and slow. You are totally calm... relaxed. You feel wonderful. (Brief pause)

Now stop imagining the scene. Please open your eyes (BUT REMAIN HYPNOTIZED). Try to not disrupt your general feeling of relaxation. We now want you to report on how vividly you experienced this scene. Please pick up the questionnaire and pen that are at your side. Rate your experience according to the few questions in front of you. Do not talk during this segment.

Please close your eyes once more. Let your body assume a comfortable position. Allow yourself to (DRIFT EVEN DEEPER INTO HYPNOSIS AND) become even more relaxed. Relax all the muscles in your body. Let each muscle become heavier and heavier...any tightness will fade away as your breathing becomes quiet and slow. You are relaxing deeper, and deeper.

We will do another scene in a moment. Remember, I want you to learn how to experience vivid imagery, through your participation in what you (HYPNOTICALLY) imagine. Just as in the previous scene, I want you to include your own actual responses in the imagery that is about to be presented. This will make the image more vivid, that is, more like the real experience of the scene I present. Don't worry if the previous scene wasn't very vivid for you. Some people are initially better than others at this, but repetition and practice has been shown in research to help everyone gradually imagine events as if they were really happening.

Please prepare yourself to imagine the scene now. Allow the (HYPNOTIC SUGGESTIONS) instructions to enable you to create the imagined scene in your mind...doing exactly what you would do in the real situation. When I finish the description, keep

imagining the scene until I tell you to stop. Let's do the scene now.

Repeat Response-Based Imagery Scene #1

Now stop imagining the scene. Please open your eyes (BUT REMAIN HYPNOTIZED). Try to not disrupt your general feeling of relaxation. We now want you to report on how vividly you experience this scene. Please pick up the questionnaire and pen that are at your side. Rate your experience according to the few questions in front of you. Do not talk during this segment.

Please close your eyes once more. Let your body assume a comfortable position. Allow yourself to (DRIFT EVEN DEEPER INTO HYPNOSIS AND) become even more relaxed. Relax all the muscles in your body. Let each muscle become heavier and heavier...any tightness will fade away as your breathing becomes quiet and slow. You are relaxing deeper, and deeper.

Prepare yourself to imagine the scene now. Allow the (HYPNOTIC SUGGESTIONS) instructions to enable you to create the imagined scene in your mind...doing exactly what you would do in the real situation. When I finish the description, keep imagining the scene until I tell you to stop. Let's do the scene now.

Response-Based Imagery Scene #2 (90 seconds)

You are sitting at home in a comfortable chair. You are sitting near a sunny window. It feels so good to be sitting with nothing to do, no need to rush anywhere.... You are feeling so relaxed. You feel a bit warm and perhaps a bit drowsy. Your body sinks back into the chair and you feel as though the chair enfolds you. Your head falls back comfortable against the head rest. You notice that all the muscles in your neck, head, and face feel quite relaxed. Your shoulders, back, legs...no tension at all. They feel quite limp and relaxed. Concentrate on this feeling...so warm, drowsy, relaxed. Your breathing is quiet and deep. Your mind is completely calm as well. Calm... quiet...relaxed. (Brief pause)

Now stop imagining the scene. Please open your eyes (BUT REMAIN HYPNOTIZED). Try to not disrupt your general feeling of relaxation. We now want you to report on how vividly you experienced this scene. Please pick up the questionnaire and pen that are at your side. Rate your experience according to the few questions in front of you. Do not talk during this segment.

Please close your eyes once more. Let your body assume a comfortable position. Allow yourself to (DRIFT EVEN DEEPER INTO HYPNOSIS AND) become even more relaxed. Relax all the muscles in your body. Let each muscle become heavier and heavier...any tightness will fade away as your breathing becomes quiet and

slow. You are relaxing deeper, and deeper.

Please prepare yourself to imagine the scene now. Allow the (HYPNOTIC SUGGESTIONS) instructions to enable you to create the imagined scene in your mind...doing exactly what you would do in the real situation. When I finish the description, keep imagining the scene until I tell you to stop. Let's do the scene now.

Repeat Response-Based Imagery Scene #2

Now stop imagining the scene. Please open your eyes (BUT REMAIN HYPNOTIZED). Try to not disrupt your general feeling of relaxation. We now want you to report on how vividly you experience this scene. Please pick up the questionnaire and pen that are at your side. Rate your experience according to the few questions in front of you. Do not talk during this segment.

Please close your eyes once more. Let your body assume a comfortable position. Allow yourself to (DRIFT EVEN DEEPER INTO HYPNOSIS AND) become even more relaxed. Relax all the muscles in your body. Let each muscle become heavier and heavier... any tightness will fade away as your breathing becomes quiet and slow. You are relaxing deeper, and deeper.

Now your task is to (HYPNOTICALLY) imagine a scene of your own choice. The only stipulation is that your scene should be similar in design to the previous scenes. That is, it should help you to actually become relaxed. Most of us have experienced certain moments in which we felt especially calm, relaxed, or peaceful...such as lying on a special couch while reading a favorite book; or strolling down a country road on a pleasant day; or enjoying the solitude of sitting in front of a warm fireplace on a cool evening. You can either imagine a scene that you have previously experienced, or you can imagine an entirely new scene that would help you to feel relaxed. You also may choose to return to one of the scenes that you imagined earlier in this session. Remember, let yourself feel your body actually relaxing during this imagined scene. Enjoy how your breathing will become slow, deep, and easy...and how any tightness in your muscles will drain out of them throughout the exercise. Close your eyes, and begin imagining your selected scene now.

Selected Scene Visualization (90 seconds)

Now stop imagining the scene. Please open your eyes (BUT REMAIN HYPNOTIZED). Try to not disrupt your general feeling of (HYPNOTIC) relaxation. We now want you to report on how vividly you experienced this scene. Please pick up the questionnaire and pen that are at your side. Rate your experience according to the few questions in front of you. Do not talk during this segment.

Please close your eyes once more. Let your body assume a

comfortable position. Allow yourself to (DRIFT EVEN DEEPER INTO HYPNOSIS AND) become even more relaxed. Relax all the muscles in your body. Let each muscle become heavier and heavier...any tightness will fade away as your breathing becomes quiet and slow. You are relaxing deeper, and deeper.

Now your task is to (HYPNOTICALLY) imagine your selected scene once more. Remember, your scene should be similar in design to the previous scenes. That is, it should help you to actually become relaxed. Let yourself feel your body actually relaxing during this imagined scene. Enjoy how your breathing will become slow, deep and easy...and how any tightness in your muscles will drain out of them throughout the exercise. Close your eyes, and begin imagining your selected scene now.

Repeat Selected Scene (90 seconds)

Now stop imagining the scene. Please open your eyes (BUT REMAIN HYPNOTIZED). Try to not disrupt your general feeling of relaxation. We now want you to report on how vividly you experienced this scene. Please pick up the questionnaire and pen that are at your side. Rate your experience according to the few questions in front of you. Do not talk during this segment.

Please close your eyes once more. Now I am going to help you to return to your normal state of alertness. As you follow my instructions you will gradually become more and more alert.

YOU'RE GOING TO WAKE UP IN A FEW MINUTES. YOU WILL FEEL REFRESHED, WIDE AWAKE, AND IN A GOOD MOOD. I WILL COUNT FROM ONE TO TEN, AND WITH EACH COUNT YOU WILL FEEL YOURSELF BECOMING MORE AND MORE AWAKE. READY? NOW; 1...BEGINNING TO AWAKE...2...3...MORE AND MORE AWAKE...4...5...STILL MORE AWAKE...6...7...GRADUALLY BECOMING AWARE OF THE SOUNDS IN THE ROOM, AND THE PRESENCE OF OTHERS...8...ALMOST COMPLETELY AWAKE...9...10...WIDE AWAKE AND REFRESHED...OPEN YOUR EYES...WIDE AWAKE. PLEASE REMAIN WHERE YOU ARE FOR THE MOMENT, AND SIT BACK WITH EYES OPEN. (Brief Pause)

(Imagery Group Only) Begin to notice how refreshed you generally feel. Take note of your relaxed muscles, your rate of breathing, and the relaxed flow of your thoughts. Gradually become aware of the sounds in this room, as well as the presence of others around you. Slowly begin to move your muscles. You may wish to stretch the muscles in your arms or legs. Let your eyes open gradually. Please remain where you are for the moment, and sit back with your eyes open.

Today I asked you to practice achieving vivid images by becoming (HYPNOTICALLY) involved in each scene--that is, by actually imagining how your muscles feel, your breathing, etc. We will continue with the same kind of practice next session.

It's important to use these imagery/HYPNOTIC skills when you have a headache, or when you feel a headache coming on. No matter what you are doing or thinking about just before or during a headache, take a few minutes out and imagine one of these scenes. Get yourself into a comfortable position, in a quiet place if possible, and imagine a scene or two. IT WILL BE POSSIBLE FOR YOU TO UTILIZE SELF-HYPNOSIS BY SIMPLY ALLOWING YOURSELF TO BECOME RELAXED AND IMAGINATIVELY FOCUSED--JUST AS YOU DID IN THIS SESSION. Remember what you've learned about vivid imagery. You must really put your own responses and feelings into the imagery. Practice it for 5 or 10 minutes every day. You may find that it takes you a while to get into it, but that's okay. Just keep going. Some people find it more difficult to do than others. It just takes practice. You'll get better and better at it the more you do it. Try to practice the imagery/SELF HYPNOSIS technique when you have time, in order to become more efficient at using it.

Name: _____

Date: _____

On the scale below, please choose the one alternative that best describes the vividness with which you imagined the scenes.

7 I imagined this very strongly, vividly and completely. The
images filled my whole mind.

6 I imagined this with a strong degree of vividness.

5

4 I imagined this with a moderate degree of vividness.

3

2 I imagined this with a slight degree of vividness.

1 I did not imagine this at all. I was unable to get any of the images.

1)	1	2	3	4	5	6	7
2)	1	2	3	4	5	6	7
3)	1	2	3	4	5	6	7
4)	1	2	3	4	5	6	7
5)	1	2	3	4	5	6	7
6)	1	2	3	4	5	6	7

HEADACHE DIARY

Name: _____ Date: _____
 Note: Key, comments, and ratings on back.

a.m.												p.m.												a.m.											
6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Circle your level of pain at breakfast, lunch, supper, and bedtime.
 Put an X through the times you take pain medication.

- 5 = Extremely intense headache, incapacitated
 4 = Severe headache, difficult to concentrate, can do undemanding tasks
 3 = Moderate headache, pain is noticeably present
 2 = Mild headache, could be ignored
 1 = Very mild headache, aware of it only when attending to it
 0 = No Headache

Headache: _____ Time _____
 Began Ended
 #0 _____
 #1 _____ Medication(s): _____
 #2 _____ Medication(s): _____
 #3 _____ Medication(s): _____

How were your spirits today?

Extremely
Poor

Extremely
Good

1 2 3 4 5 6 7
 How much stress did you experience today?
 None Very Much

0 1 2 3 4 5 6

THE CARLETON UNIVERSITY
RESPONSIVENESS TO SUGGESTION SCALE

(7) CURSS

Name _____ Date _____

Age _____ Sex _____ Occupation _____

Telephone _____

PLEASE DO NOT OPEN this booklet until specifically instructed to do so.

- 2 -

(7) CURSS

Now, in your own words please list all of the suggestions you can remember. You have two minutes to do this.

PLEASE DO NOT TURN THIS PAGE until you are specifically instructed to do so.

- 3 -

(7) CURSS

PLEASE DO NOT RETURN TO PAGE 2.

PLEASE DO NOT TURN THIS PAGE until you are specifically instructed to do so.

PLEASE DO NOT RETURN TO EARLIER PAGES

Now, in your own words please list all of the suggestions you can remember. You have two minutes to do this.

PLEASE DO NOT TURN THIS PAGE until you are specifically instructed to do so.

PLEASE DO NOT RETURN TO EARLIER PAGES

Now, in your own words, please list all of the suggestions you can remember. You have two minutes to do this.

PLEASE DO NOT TURN THIS PAGE until you are specifically instructed to do so.

SECTION ON OBJECTIVE, OUTWARD RESPONSES

Listed below in chronological order are the specific suggestions you were administered following the standard hypnotic induction procedure. We wish you to estimate whether or not you objectively responded to these suggestions, that is, whether or not an onlooker would have observed that you did or did not make certain definite responses by certain specific, predefined criteria. Thus, in this section we are interested in your estimates of your outward behaviour and not in what your inner, subjective experience of it was like. Later on you will be given an opportunity to describe your inner, subjective experience, but in this section refer only to the outward behavioural responses irrespective of what the experience may have been like subjectively.

It is understood that in some cases your estimates may not be as accurate as you might wish them to be and that you might even have to guess. But we want you to make whatever you feel to be your best estimates.

Beneath a description of each of the six suggestions are sets of two responses, labeled A and B. Please circle either A or B for each question, whichever you judge to be the more accurate. Please answer every question. Make sure that you do not skip any questions. Please answer every one.

1. Arm Rising (Right Arm)

You were asked to extend your right arm straight out in front of you, and were told that your arm was rising into the air. Would you estimate that an onlooker could have observed that your arm had risen at least six inches (before the time you were asked to replace the arm in your lap)?

Circle one: A. My arm rose at least six inches

B. My arm rose less than six inches

II. Arms Moving Apart

You were asked to extend your arms strait out in front of you with the fingers of one hand touching the fingers of the other. You were then told that your arms were moving apart. Would you estimate that an onlooker would have observed that your hands had moved apart by at least six inches (before the time you were asked to replace them in your lap)?

- Circle one: A. My hands had moved apart at least six inches
B. My hands moved apart less than six inches

III. Arm Rigidity (Left Arm)

You were asked to hold your left arm straight out in front of you, and were told that the arm was becoming stiff and rigid and that it would not bend. You were then asked to try to bend it. would you estimate that an onlooker would have observed that there was less than two inches of arm bending (before you were told that your arm was no longer stiff and to replace it in your lap)?

- Circle one: A. My arm was bent less than two inches by then
B. My arm was bent two or more inches by then

IV. Arm Heaviness (Right Arm)

You were asked to place your right forearm on the table with your hand facing down. You were then told how heavy your arm and hand felt and asked to try to lift them from the table. Would you estimate that an onlooker would have observed that you did not lift your hand and arm at least one inch up from the table (before being told that your arm was no longer heavy)?

- Circle one: A. I did not lift my arm and hand at least one inch by then
B. I did lift my arm and hand an inch of more by then

V. Experiencing Music

You were told that a record player had been brought into the room, that you would hear it playing Jingle Bells, and that you would move your head to keep time to the tune. Would you estimate that an onlooker would have observed you to make recognizable movements of the head (before you were told that the record player had been turned off)?

Circle one: A. I did recognizably move my head to the tune

B. I did not recognizably move my head to the tune

VI. Experiencing a Kitten

You were told that a kitten was sitting in your lap. Then you were asked to look at the kitten and to pet it with your hand. Would you estimate that on onlooker would have observed you to make a petting movement with your hand?

Circle one: A. I did make a petting movement with my hand

B. I did not make a petting movement with my hand

PLEASE DO NOT RETURN TO EARLIER PAGES

SECTION ON SUBJECTIVE, INNER EXPERIENCE I

In this section we are interested in your inner subjective experiences instead of your outward behaviour. We want to find out about what you experienced during each of the suggestions you were given. Please read each question carefully and answer it honestly. The outward response people make to a suggestion may or may not correspond to their inner experience. For example, take a person who's outward behaviour is arm rising when given the suggestion that their arm is light and moving upward. In some cases a person may have experienced his or her arm as feeling light. In other cases, however, the person's arm may have moved upward even though it did not feel the least bit light. The important thing to keep in mind is that one type of experience is no better or no worse than the other. This is a scientific study, and all we are interested in is getting at the truth of what people experience. So please be honest in answering each of the following questions. Please answer every question. Make sure that you do not skip any questions.

For each question, choose the one alternative that best describes your experience.

I. Arm Rising (Right Arm)

You were told that your arm was feeling lighter and lighter and was rising in the air. You were asked to imagine that it was like a balloon and was being filled with air.

During this suggestion my arm felt light:

- (a) Not at all
- (b) To a slight degree
- (c) To a moderate degree
- (d) To a great degree

II. Arms Moving Apart

You were told that your outstretched arms were moving apart, and that they felt like a force was repelling them and pushing them apart.

During this suggestion, my arms felt like a force was pushing them apart:

- (a) Not at all
- (b) To a slight degree
- (c) To a moderate degree
- (d) To a great degree

III. Arms Rigidity (Left Arm)

You were told that your outstretched left arm was becoming stiff, rigid, and unable to bend. You were asked to imagine the arm in a splint.

During this suggestion, my arm felt stiff and rigid:

- (a) Not at all
- (b) To a slight degree
- (c) To a moderate degree
- (d) To a great degree

IV. Arm Heaviness (Right Arm)

You were told that your arm and hand were very heavy, so heavy that you couldn't lift them from the table. You were asked to imagine heavy weights placed on your hand and arm.

During this suggestion my arm and hand felt heavy:

- (a) Not at all
- (b) To a slight degree
- (c) To a moderate degree
- (d) To a great degree

V. Experiencing music

You were told that you would hear the song Jingle Bells and that you would move your head in time with the music.

During this suggestion, I felt like I was hearing the tune Jingle Bells:

- (a) Not at all
- (b) To a slight degree
- (c) To a moderate degree
- (d) To a great degree

VI. Experiencing a Kitten

You were told that you would see a kitten in your lap and that you would pet the kitten.

During this suggestion, I felt like I was seeing a kitten:

- (a) Not at all
- (b) To a slight degree
- (c) To a moderate degree
- (d) To a great degree

VII. Forgetting the Suggestions

You were told that you would be unable to remember any of the suggestions you had been given until you heard a tap and the words "Now you can remember everything". You were told that you would be unable to remember the suggestions even when you were asked to try to remember.

During this suggestion, I forgot the suggestions:

- (a) Not at all
- (b) To a slight degree
- (c) To a moderate degree
- (d) To a great degree

PLEASE DO NOT RETURN TO EARLIER PAGES

SECTION ON SUBJECTIVE, INNER EXPERIENCES 11

In this section we are interested in a particular class of subjective, inner experiences. We want to find out about the extent to which you experienced your outward behaviour to each suggestion as happening automatically and without a feeling of effort. For example, take a person whose outward behaviour is to not bend their arm when they are told that the arm is stiff and unable to bend. Such a person may have felt that his or her arm was unable to bend. For this person it may have felt like the arm became stiff and unable to bend all by itself. In other cases, however, a person may not bend their arm even though they know that they could have bent it if they chose to. This person would have had the feeling of voluntarily choosing not to bend the arm. Remember, one type of experience is no better and no worse than the other. We are equally interested in finding out about experiences that feel automatic and also about those that feel voluntary. All we are interested in is getting at the truth about what people experience. So, please be honest in answering each of the following questions. Please answer every question. Make sure you do not skip any questions.

For each question choose the one answer that best describes your experience.

I. Arm Rising (Right Arm)

You were told that your arm was light and rising in the air.

During this suggestion, my arm felt like it rose in the air by itself. I experienced that

- (a) Not at all
- (b) To a slight degree
- (c) To a moderate degree
- (d) To a great degree

Remember: if you chose to lift your arm voluntarily, or if your arm did not feel like it rose by itself, you should choose alternative (a)

II. Arms Moving Apart

You were told that your outstretched arms were moving apart.

During this suggestion, my arms felt like they were moving apart by themselves. I experienced this

- (a) Not at all
- (b) To a slight degree
- (c) To a moderate degree
- (d) To a great degree

Remember: If you chose to move your arm voluntarily, or if your arms did not feel like they moved by themselves, you should choose alternative (a).

III. Arm Rigidity (Left Arm)

You were told that your outstretched arm was becoming stiff and unable to bend.

During this suggestion my arm felt like it was unable to bend. I experienced this

- (a) Not at all
- (b) To a slight degree
- (c) To a moderate degree
- (d) To a great degree

Remember: If you chose voluntarily to not bend your arm, or if your arm did not feel unable to bend you should choose alternative (a).

IV. Arm Heaviness (Right Arm)

You were told that your arm and hand were too heavy to lift from the table.

During this suggestion, my arm felt unable to be lifted. I experienced this

- (a) Not at all
- (b) To a slight degree
- (c) To a moderate degree
- (d) To a great degree

Remember: If you chose voluntarily to not lift your arm, or if your arm did not feel unable to life you should choose alternative (a).

V. Experiencing Music

You were told that you would hear the song Jingle Bells.

During this suggestion the tune Jingle Bells seemed to occur automatically, without any effort on my part. I experienced that

- (a) Not at all
- (b) To a slight degree
- (c) To a moderate degree
- (d) To a great degree

Remember: If experiencing the tune seemed to take a good deal of effort on your part, or if you did not experience the tune choose alternative (a).

VI. Experiencing a Kitten

You were told that you would see a kitten in your lap.

During this suggestion the image of a kitten seemed to occur automatically, without any effort on my part. I experience this

- (a) Not at all
- (b) To a slight degree
- (c) To a moderate degree
- (d) To a great degree

Remember: If getting an image of a kitten seemed to take a good deal of effort, or if you did not get an image at all choose alternative (a).

VII. Forgetting the Suggestions

You were told that you would be unable to remember the suggestion you had been given.

During this time the suggestions seemed to disappear automatically from my memory, they seemed to just go away by themselves. I experienced this

- (a) Not at all
- (b) To a slight degree
- (c) To a moderate degree
- (d) To a great degree

Remember: If forgetting the suggestions seemed to require effort on your part, if you had to "try and forget", or if you felt that you did not forget anything, you should choose alternative (a).

Appendix G

Protocol for Finger Pressure Trials

1st Pain Trial (All conditions)

-We are going to use this device to assess your perceptions of pain. First, I'd like you to familiarize yourself with this 21 point scale - notice that 0 indicates no pain at all - 10 indicates moderate pain and 20 indicates excruciating pain. I'm going to ask you to place either your index finger or middle finger into the device for a period of 60 seconds. I will ask you to do this three times. Fifteen seconds after each trial I will say report - at which point I want you to callout your level of pain according to this scale. Throughout the entire procedure I will ask you to keep your eyes closed and refrain from talking. If at any time the pain is such that you feel you cannot go on, say 'stop' and we will discontinue the experiment.

2nd Pain Trial (Treatment conditions only)

-Now on this second trial I'd like you to use your imagination skills that you learned during your treatment. I want you to try to vividly imagine one of the scenes that you were presented during your treatment in order to distract yourself from the discomfort that you may experience. For example, try to imagine the scene on the beach....(remind subjects of scene). Once again, try to vividly imagine this scene as best you can in order to reduce the discomfort that you might experience.

Third Pain Trial

-Now I'm going to ask you to place your finger in the device for

2

of/de

2

PM-1 3½"x4" PHOTOGRAPHIC MICROCOPY TARGET
NBS 1010a ANSI/ISO #2 EQUIVALENT

a final trial of 60 seconds.

(Compliance task; administered during 15 second interval following pain trial to 2/3rds of treatment conditions)

-Often people who have been taught a skill to cope with pain will automatically use it when they haven't been instructed to do so.

For this reason you probably felt very little pain on the last trial compared to the first trial.

Appendix H INSTRUCTIONS

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The following questions are concerned with the way you feel or act.
Please tick the answer that applies to you. Don't spend long on any one quest

- ...1. Do you often feel upset for no obvious reason? Yes.. No..
- ...2. Do you have an unreasonable fear of being in enclosed spaces such as shops, elevators, etc.? Often.. Sometimes.. Never..
- ...3. Do people ever say you are too conscientious? No.. Yes..
- ...4. Are you troubled by dizziness or shortness of breath? Never.. Often.. Sometimes..
- ...5. Can you think as quickly as you used to? Yes.. No..
- ...6. Are your opinions easily influenced? Yes.. No..
- ...7. Have you felt as though you might faint? Frequently... Occasionally.. Never..
- ...8. Do you find yourself worrying about getting some incurable illness? Never.. Sometimes.. Often..
- ...9. Do you think that "cleanliness is next to godliness"? No.. Yes..
- ...10. Do you often feel sick or have indigestion? Yes.. No..
- ...11. Do you feel that life is too much effort? At times... Often.. Never..
- ...12. Have you, at any time in your life, enjoyed acting? Yes.. No..
- ...13. Do you feel uneasy and restless? Frequently.. Sometimes.. Never..
- ...14. Do you feel more relaxed indoors? Definitely.. Sometimes.. Not particularly.
- ...15. Do you find that silly and unreasonable thoughts keep recurring in your mind? Frequently.. Sometimes.. Never..
- ...16. Do you sometimes feel tingling or pricking sensations in your body arms, or legs? Rarely.. Frequently.. Never..
- ...17. Do you regret much of your past behavior? Yes.. No..
- ...18. Are you normally an excessively emotional person? Yes.. No..
- ...19. Do you sometimes feel really panicky? No.. Yes..
- ...20. Do you feel uneasy travelling on buses or the subway even if they are not crowded? Very.. A little.. Not at all..
- ...21. Are you happiest when you are working? Yes.. No..
- ...22. Has your appetite got less recently? No.. Yes..
- ...23. Do you awake unusually early in the morning? Yes.. No..
- ...24. Do you enjoy being the centre of attention? No.. Yes..
- ...25. Would you say you were a worrying person? Very.. Fairly.. Not at all..

- ...26. Do you dislike going out alone? Yes.. No..
- ...27. Are you a perfectionist? No.. Yes..
- ...28. Do you feel unduly tired and exhausted?
Often.. Sometimes.. Never..
- ...29. Do you experience long periods of sadness? Never.. Often.. Sometimes..
- ...30. Do you find that you take advantage of circumstances for your own ends?
Never.. Sometimes.. Often..
- ...31. Do you often feel strung-up inside? Yes.. No..
- ...32. Do you worry unduly when relatives are late coming home? No.. Yes..
- ...33. Do you have to check things you do to an unnecessary extent?
Yes.. No..
- ...34. Can you get alright to sleep at the moment? No.. Yes..
- ...35. Do you have to make a special effort to face up to a crisis or difficulty?
Very much so.. Sometimes.. Not more than anyone else..
- ...36. Do you often spend a lot of money on clothes? Yes.. No..
- ...37. Have you ever had the feeling you are "going to pieces"? Yes.. No..
- ...38. Are you scared of heights? Very.. Fairly.. Not at all..
- ...39. Does it irritate you if your normal routine is disturbed?
Greatly.. A little.. Not at all..
- ...40. Do you often suffer from excessive sweating or fluttering of the heart?
No.. Yes..
- ...41. Do you find yourself needing to cry? Frequently.. Sometimes.. Never..
- ...42. Do you enjoy dramatic situations? Yes.. No..
- ...43. Do you have bad dreams which upset you when you wake up?
Never.. Sometimes.. Frequently..
- ...44. Do you feel panicky in crowds? Always.. Sometimes.. Never..
- ...45. Do you find yourself worrying unreasonably about things that do
not really matter? Never.. Frequently.. Sometimes..
- ...46. Has your sexual interest altered? Less.. The same or greater..
- ...47. Have you lost your ability to feel sympathy for other people?
No.. Yes..
- ...48. Do you sometimes find yourself posing or pretending? Yes.. No..

A O D

P S H

1.
2.
3.

Directions: Hassles are irritants that can range from minor annoyances to fairly major pressures, problems, or difficulties. They can occur few or many times.

Listed in the center of the following pages are a number of ways in which a person can feel hassled. First, circle the hassles that have happened to you in the past month. Then look at the numbers on the right of the items you circled. Indicate by circling a 1, 2, or 3 how **SEVERE** each of the circled hassles has been for you in the past month. If a hassle did not occur in the last month do NOT circle it.

HASSLES	SEVERITY		
	1. Somewhat severe		
	2. Moderately severe		
	3. Extremely severe		
1. Your child(ren).....	1	2	3
2. Your parents or parents-in-law.....	1	2	3
3. Other relative(s).....	1	2	3
4. Your spouse.....	1	2	3
5. Time spent with family.....	1	2	3
6. Health or well-being of a family member.....	1	2	3
7. Sex.....	1	2	3
8. Intimacy.....	1	2	3
9. Family-related obligations.....	1	2	3
10. Your friend(s).....	1	2	3
11. Fellow workers.....	1	2	3
12. Clients, customers, patients, etc.	1	2	3
13. Your supervisor or employer.....	1	2	3
14. The nature of your work.....	1	2	3
15. Your work load.....	1	2	3
16. Your job security.....	1	2	3
17. Meeting deadlines or goals on the job.....	1	2	3
18. Enough money for necessities (e.g., food, clothing, housing, health care, taxes, insurance).....	1	2	3

19. Enough money for education.....1 2 3
20. Enough money for emergencies.....1 2 3
21. Enough money for extras (e.g., entertainment, recreation,
vacations).....1 2 3
22. Financial care for someone who doesn't live with you.....1 2 3
23. Investments.....1 2 3
24. Your smoking.....1 2 3
25. Your drinking.....1 2 3
26. Mood-altering drugs.....1 2 3
27. Your physical appearance.....1 2 3
28. Contraception.....1 2 3
29. Exercise(s).....1 2 3
30. Your medical care.....1 2 3
31. Your health.....1 2 3
32. Your physical abilities.....1 2 3
33. The weather.....1 2 3
34. News events.....1 2 3
35. Your environment (e.g., quality of air, noise level, greenery)
.....1 2 3
36. Political or social issues.....1 2 3
37. Your neighbourhood (e.g., neighbors, setting).....1 2 3
38. Conserving (gas, electricity, water, gasoline, etc.).....1 2 3
39. Pets.....1 2 3
40. Cooking.....1 2 3
41. Housework.....1 2 3
42. Home repairs.....1 2 3
43. Yardwork.....1 2 3
44. Car maintenance.....1 2 3

45. Taking care of paperwork (e.g., paying bills, filling out forms) ⁹⁰	1	2	3
46. Home entertainment (e.g., TV, music, reading).....	1	2	3
47. Amount of free time.....	1	2	3
48. Recreation and entertainment outside the home (e.g., movies, sports, eating out, walking).....	1	2	3
49. Eating (at home).....	1	2	3
50. Church or community organizations.....	1	2	3
51. Legal matters.....	1	2	3
52. Being organized.....	1	2	3
53. Social commitments.....	1	2	3

RSE Scale

(2) Rosenberg.1

Instructions: Please indicate your degree of agreement or disagreement with each of the following statements by circling the appropriate option for each statement.

S = strongly agree

A = agree

D = disagree

SD = strongly disagree

-
1. On the whole, I am satisfied with myself.	SA	A	D	SD
2. At times I think I am no good at all.	SA	A	D	SD
3. I feel that I have a number of good qualities.	SA	A	D	SD
4. I am able to do things as well as most other people.	SA	A	D	SD
5. I feel I do not have much to be proud of.	SA	A	D	SD
6. I certainly feel useless at times.	SA	A	D	SD
7. I feel that I'm a person of worth, at least on an equal plane with others.	SA	A	D	SD
8. I wish I could have more respect for myself.	SA	A	D	SD
9. All in all, I am inclined to feel that I am a failure.	SA	A	D	SD
10. I take a positive attitude toward myself.	SA	A	D	SD

Appendix K
HEADACHE HISTORY

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Please check the applicable categories regarding these demographic features.

Name _____ Student ID _____ Age _____

Are you () single

() married/living with a common-law spouse

How many years of the post secondary education have you completed?

() none; () one; () 2; () 3; () 4; () 5; Or more

1. At what age (approx) did your headaches begin? _____
At what age did you think of your headaches as a problem? _____

2. Was the onset of your headaches associated with any particular physical event (e. g. illness, injury) Yes () No ()
Please specify event _____

3. What is your personal explanation for the cause of your headaches, name as many factors as necessary.

4. How confident are you that you know the real cause of your headaches?

Select a number from 1 to 10; _____

(0)	(10)
Not at all _____	Totally _____
Confident	Confident

Check here if you do not attribute the cause of your headaches to any particular factor (s) _____

5. Have you ever sought medical attention for headaches/ Y () N ()
At what age was medical attention first sought/ _____
Were you referred to a specialist/ Y () N ()
Please specify what kind of specialist you saw: _____

6. What kind of diagnostic work have you received for headaches?
Check every item that is applicable
() general physical exam
() neurological exam
() EEG - electrodes placed on the surface of your head to measure cortical activity
() brain scan
() X-rays
() other - please specify _____

7. Have you ever been given a formal headache diagnosis Yes () No ()
 If so, were you diagnosed by your family physician Yes () No ()
 ...if yes, what was the diagnosis-_____

8. What kind(s) of treatment have you received for your headaches?

Check as many that are appropriate

- () physiotherapy
 () psychotherapy (by psychiatrist or psychologist)
 () relaxation training
 () biofeedback training
 () treatment by a chiropractor
 () counselling from a dietician or nutritionist
 () prescribed medications
 () other- specify_____

9. What medications do you currently take to control your headaches?

Check appropriate category as well as approximate dosage:

- () Prescribed medication(s)

List all:_____

- () Non-prescribed medication(s)

List all:_____

- () Alcohol

Specify:_____

10. What do you presently do in order to manage your headaches?

11. List ALL of the features below that characterize your typical headache:

- () pain on both sides of the head
 () pain in the forehead area though it may sometimes start at the back of the head or neck
 () pain is a persistent dull ache
 () pain feel like a cap or band around the head
 () sensations of tightness or pressure accompany headache
 () pain is only on one side of the head
 () pain is a throbbing sensation
 () one or more of the following signs precede or accompany the headache-
 parts of the visual field disappear temporarily, flashing lights, strange odors, tingling sensations
 () nausea or vomiting usually accompanies headaches
 () sensitivity to light accompanies headache

12. Do you have any chronic illness/condition that may or may not be associated with your headaches? Y () N ()

If yes please specify _____

13. Approximately what is your parents total annual income? \$.....

(If you are financially independent-What is your total annual income?)

14. How satisfied are you with your financial situation? (please check one)

Extremely dissatisfied

Not satisfied

Neither satisfied nor dissatisfied. . . .

Satisfied

Extremely satisfied

15. What is the highest level of formal education completed by your father? Please check one.

Elementary school

Junior high school

High school

Community college or trade school.

University

Graduate school

16. What is the highest level of formal education completed by your mother? Please check one.

Elementary school

Junior high school

High school

Community college or trade school.

University

Graduate school

INFORMED CONSENT AGREEMENT

This project has been reviewed and approved by the Committee on Research with Human Subjects in the Department of Psychology at Carleton University. It has been found to preserve the safeguards of subjects' privacy, welfare, and civil liberties.

I hereby agree to cooperate and participate in the research project entitled

Treatments for Recurrent Headaches

conducted by Manuel Arango, supervised by Professor Nicholas P. Spanos of the Psychology Department at Carleton University. I have informed the experimenter that I have no medical condition that would prohibit my participation in this project.

I acknowledge that I have been informed about my participation in this experiment. I understand that data reported from this study will only pertain to group characteristics--thereby protecting my individual privacy.

I understand that I have the freedom and right to withdraw from the experiment at any time, without question or reprimand by either the principal investigators or Carleton University.

Participant's Signature

Date

Principal Investigator

EXPERIMENTAL CONSENT FORM

This project has been reviewed and approved by the Department of Psychology Committee on Research with Human Subjects as preserving the safeguards of subjects' privacy, welfare and civil liberties. The Chairperson of the Committee may be reached through the Department of Psychology, Carleton University.

Because this experiment may involve some discomfort, we would like you to be aware of the procedures involved before you agree to participate further. Those with any diagnosed or suspected medical conditions that may be exacerbated by these procedures should not participate.

During this experiment, you will be asked to place a finger in a finger pressure device on three occasions. Following each finger pressure trial, you will be asked to estimate the intensity of the sensations that you experience, according to a scale that you will be shown.

It is important to the success of the experiment that subjects keep their finger in the device for the full sixty seconds during each test, and we have found in previous experiments that almost all subjects are able to do this. However, if at any time you should find that the sensations become so unpleasant that you cannot continue, you may withdraw from the experiment at that point, without loss of experimental credit or compensation.

I, the undersigned, have read the above and am willing to cooperate in the experiment described therein. I understand that I have the freedom to withdraw from the experiment at any time.

Signature of Participant _____

Signature of Experimenter _____

How effective do you believe your treatment was in terms of reducing your headache pain?

0 1 2 3 4 5 6 7

Not effective ----- Moderately effective ----- ^{Very} effective

DEBRIEFING SUMMARY

The purpose of this experiment was to compare the efficacy of hypnotic and nonhypnotic guided imagery training for the reduction of headache activity, and to assess the role of compliance in treatment effectiveness. For participation in this experiment it was necessary to assess each person's average headache activity prior to, during and following the experiment. Both the hypnotic and the nonhypnotic guided imagery procedures used in this experiment constitute pain management techniques that can facilitate self-control over headaches in some individuals. These treatments were designed to induce a sense of relaxation and control over the pattern of headache recurrence. The monitoring condition enabled us to determine if individuals would have undergone changes in headache activity for reasons that we did not anticipate and control for in this experiment.

Another purpose of this experiment was to examine the relationship between the ability of people to control naturally occurring pain like headache, and their ability to control externally administered laboratory pain. This information will be important in helping us to determine the extent to which the study of laboratory pain can be generalized to the treatment of naturally occurring pain.

If the treatment condition to which you were assigned was not effective in reducing your headache activity, we advise that you consult your family doctor for alternative means to treat your headaches. Although there are a number of clinics in the Ottawa region which offer treatment programs for headaches (such as the research laboratories at Ottawa University), no program in particular has been effective for all people. Your best recourse is to consult with a physician who can advise you of

the number of behavioral and pharmacological interventions available and assess which treatment best suits you personally. If your family doctor is not able to advise you, he or she can refer you to a neurologist or other specialist who can provide you with the necessary information.

Thank you for participating in this study. The data the we have collected, as a result of your cooperation, will be compared to that obtained in outhier research laboratories.

END

28-05-92

FIN