HYPNOSIS, PAIN CONTROL AND PERSONALITY CHANGE
IN RHEUMATOID ARTHRITIC PATIENTS

by

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G. Craig Orme
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ABSTRACT

Hypnosis, Pain Control and Personality Change in Rheumatoid Arthritic Patients

by

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The purpose of this project was to examine the effect of hypnosis as a treatment in the control of pain in a population of rheumatoid arthritic patients and further to examine any associated change in emotionality.

Three groups of patients suffering from the pain of rheumatoid arthritis were selected. One group served as a control group. The other two groups served as a modified control group and as a treatment group, respectively.

All three groups were pre, mid, and post-tested using the McGill Pain Questionnaire, the Minnesota Multiphasic Personality Inventory, the California Personality Inventory Well-Being scale items, and a check of their medication intake. The testing periods were before any treatment procedures were introduced, after a 6 week therapy involvement period for the modified control group and treatment group, and after another 6 week period with no further interaction of the patients with the therapists. The
treatment group received hypnosis instruction for the treatment of pain, the modified control group received a ventilation or talk therapy, and the control group was not seen by any therapist.

It was found that self-hypnosis offers a viable and practical treatment technique to individuals in the control of their pain. Individuals were not only able to reduce their perception of pain and its effect on their lives, but they were also able to be the ones in control of the process.

Both the treatment group and the modified control group were able to achieve positive change in several emotional factors. The treatment group was able to achieve a more significant change and one that persisted after the therapy sessions were terminated. The members of the treatment group were thus able to increase their emotional functioning and decrease their dependency on medications. The treatment group was the only group able to decrease medication intake significantly thus again indicating the importance of learning a self-help procedure for controlling pain. It would seem from the results of this study that using self-hypnosis for pain control is useful and practical.
INTRODUCTION

In an article on the management of arthritis, Ehrlich (1975) made reference to the fact that many physicians feel like going out the back door whenever they see a patient with rheumatoid arthritis (R.A.) coming into their office. He stated that physicians can not just give sufferers of rheumatoid arthritis pills and injections and feel that they are competent in their treatment. Ehrlich further stressed the need of emotional and psychological counseling to help these patients deal with the intense stress involved with their "incurable and progressive disease."

Rheumatoid arthritis has long been identified as a progressive disease which, to say the least, is accompanied by a great deal of chronic pain. At the present time, there appears to be no cure, only occasional relief through the use of medications and various other treatments. Relief is for the most part temporary and almost always accompanied by some undesirable side effect. The rheumatoid arthritis sufferer is left with feelings of hopelessness and dependency because of the nature of the disease and the relentless onslaught of pain. This can very often lead to increased emotionality, which often takes the form of depression, isolation, resentment, hostility, or despair. These emotional feelings are further confused with the frustrating failures of various medical and magical cures and hope which is offered, but never seems to be actualized.
In conjunction with the associated pain and emotionality of having a disease such as rheumatoid arthritis, we must consider the seemingly hostile, but only indifferent, attitude of society. In his book discussing the management of the arthritic patient, Ehrlich (1973) points out

disability is largely imposed by society rather than by arthritis itself. The imposing fronts of many public buildings are made impressive by long flights of stairs. These same stairs deny ready access to all but the physically able. The toilets in many public buildings, such as restaurants and theaters, often are accessible only by stairs. Even when access is direct, the doors, and the booths, may not be wide enough to permit use by someone using crutches or a wheelchair. (p. 2)

He goes on to describe the difficulty the physically disabled encounter in dealing with automobiles, buses, furniture, curbs, thresholds, and various other aspects of life that most of the population easily take for granted. It would seem to be easy to understand then why people afflicted with crippling disabilities such as rheumatoid arthritis, would be filled with emotional distress, often to the point of angry, hostile attitudes directed at the world around them.

Hostility has many faces of expression, including one which is often difficult to recognize, hostility expressed through dependency. Because of the crippling effect of rheumatoid arthritis, many of those so afflicted become increasingly dependent upon their families and friends. This is often not a matter of choice and in many cases is feared. Wiener stated: "Some patients fear the dependent role to such an extent that they will live alone at tremendous sacrifice in order to avoid the dependent status they
would have in the family home." (Wiener, 1975, p. 99) Even though some of the dependency of a rheumatoid arthritis sufferer seems to be warranted, another part seems to be the expression of repressed hostility. As the disease progresses, so does the physical dependency, only further complicating the existence of psychological dependency.

The people closest to the rheumatoid arthritis sufferer want to help ease the pain. As they do more to help the sufferer, they unknowingly escalate the dependency of the one in pain. This all appears to be well and good, but there seems to be a limit to the amount of time one is willing to tolerate another person's dependency and accompanying problems. After a while, the ones closest to the rheumatoid arthritis sufferer seem to turn away. They may continue to do things for the sufferer, but with reservation. Whether consciously or unconsciously, they do their deeds of good perfunctorially, with an attitude of "I wish I didn't have to do this" that comes across to the rheumatoid arthritis sufferer as rejection, further complicating their emotionality.

Ehrlich (1973), Wiener (1975), Rimon (1974) and other similar experts in the field of human health, suggest that in addition to the physical and medical treatments already rendered, emotional support needs to be given. The consensus of these experts seems to be that dependency must be kept to a minimum and independency rewarded. And since most of the common treatments of rheumatoid arthritis involve both a dependency on the treatment process or components of it and/or the individuals doing the
treating, this opinion also is expressed in relationship to medications, surgeries, human support and other treatment processes rendered rheumatoid arthritic sufferers.

One method of treatment that is gaining additional usage in the medical world today for the alleviation of chronic pain is that of hypnosis. It has long been known that hypnosis offers many useful results when it is used in a treatment procedure. Only recently has hypnosis been utilized to any great extent for the alleviation of chronic pain, although it was used to some degree before the discovery of pain-killing drugs.

In addition to hypnosis offering a technique of effective pain control, it also offers the benefit of increased physical and mental relaxation from tensions which are almost always associated with chronic relaxation from tensions which are almost always associated with chronic pain. Hilgard and Hilgard (1975) have shown hypnosis to be an effective technique for relieving pain and further have declared it to be a great aid in self-help programs where independence is a desirable asset (p. 91). They stressed that teaching patients how to gain a measure of control over situations in which they previously felt helpless, is of utmost importance in patient care when using hypnosis.

LaBaw (1969, p. 314) noted that "an important contribution of self-hypnosis was return of maximum control to the patient, permitting the desperately ill person to make constructive use of the days salvaged from pain and the fear of death." The suffering is apparently relieved and in
addition, the emotionality associated with pain and suffering is also changed when self-hypnosis is used in working with chronic pain. By decreasing dependency in such a manner, it would seem that we could also increase a patient's feelings of self-worth and well being.

The major purpose of this project was to examine the effect of self-hypnosis as a treatment in the control of pain in a population of rheumatoid arthritic patients and further to examine any associated change in emotionality. Several methods were utilized to measure perceived pain and any resulting change in pain and emotionality. First, reduction in the amount of medication taken for pain control by the rheumatoid arthritis patient was used to indicate an increase in pain threshold or a decrease in the amount of perceived pain. Second, self-report as to the presence of pain, strength of pain, and disabling effect of pain was used to indicate a change of pain perception and tolerance. And third, differences in personality profiles in a control group and experimental groups were used to determine the effectiveness of hypnosis in providing patients their own method of pain control, thereby decreasing dependency and its associated emotional influences.

Hypotheses

1. There is no difference in pre-observation, mid-observation and post-observation in regarding a) the amount of medication taken; b) the pain rating index score; c) the perceived pain index score; d) MMPI scale number 1;
e) MMPI scale number 2; f) MMPI scale number 3; g) MMPI scale number 7; and h) CPI well being scale of a population of rheumatoid arthritic patients.

2. There is no difference between a control group, a modified control group, and an experimental group with regard to a) the amount of medication taken; b) the pain rating index score; c) the perceived pain index score; d) MMPI scale number 1; e) MMPI scale number 2; f) MMPI scale number 3; g) MMPI scale number 7; and h) CPI well being scale of a population of rheumatoid arthritic patients.

3. There is no difference in the interaction effect between the groups over the three observation periods regarding a) the amount of medication taken; b) the pain rating index score; c) the perceived pain index score; d) MMPI scale number 1; d) MMPI scale number 2; f) MMPI scale number 3; g) MMPI scale number 7; and h) CPI well being scale of a population of rheumatoid arthritic patients.
REVIEW OF LITERATURE

There has been a vast amount of literature compiled in an effort to describe the nature of rheumatoid arthritis. There has been a similar large body of research undertaken in an effort to understand and explain the phenomenon of hypnosis. It is beyond the scope of this paper to attempt to fully review the literature available in these two vast areas of research. Therefore, the review of literature has been limited to cover only those areas most pertinent to this study.

The review of literature will be divided into two major areas of discussion. The first area will review and discuss those studies and writings which investigate the psychological factors associated with rheumatoid arthritis. The second area will review those studies and writings which deal with the control of pain using hypnosis and hypnosis related approaches.

Psychological Factors Associated with Rheumatoid Arthritis

The influence of various psychological factors as causative or reactive agents in individual with rheumatoid arthritis has been investigated from various viewpoints and comprehensive and critical reviews have appeared (King, 1955; Meyerowitz, 1966; Moos, 1964; Scotch and Geiger, 1962; Wolff, 1971). King's review of 50 earlier publications summarized a formidable list of negative psychological characteristics reported in the literature. In general, research findings have shown that individuals with arthritis manifest
conflicts and deficits in expression of autonomy, affiliation, anger and aggression, and sexuality. The various postulations of premorbid, negative personality traits and linkage of emotional factors to disease onset and exacerbations have not gone unchallenged.

Meyerowitz (1966) suggested a meaningful grouping of psychological hypotheses relevant to rheumatoid disease: 1) A specificity hypothesis which assumes identifiable psychological characteristics have been present prior to disease or premorbidity; 2) A disease-onset hypothesis which implies there is a significant association between certain types of life experiences and psychological states and the onset of rheumatoid disease; and 3) A disease-course hypothesis which suggest that identifiable psychological responses observed in persons with rheumatoid arthritis influences the course of illness. In concluding his review, Meyerowitz suggested that a more reasonable research objective would include examination of the possible role of psychological variables in the etiology and course of rheumatoid arthritis in the context of all the available information from the molecular to the socioepidemiological level.

Many of the researchers and reviewers have been cognizant of the problems of measuring psychological factors in arthritis patients. Most of the early studies reviewed by King (1955) were descriptive and presented serious methodological problems in their investigative approaches. Moos (1964), Scotch and Geiger (1962), and Wolff (1971) were in essential
agreement concerning the lack of scientific merit of many later investigations. They felt that many studies did not demonstrate whether similar emotional factors are found in other disability groups or if psychological characteristics identified are specific to rheumatoid disease. They suggested that selection of control subjects is tenuous at best and because of the unpredictable course of exacerbations and remissions along with the crippling nature of the disease there is imposed a major difficulty in obtaining a comparable comparison group. Most of these reviewers concluded that the heterogeneity of research methods, population samples, and comparison groups used in most investigations makes it difficult to compare--much less interpret--the results reported.

In another most thorough review of literature, Hoffman (1974) again looked at the literature dealing with investigations of psychological factors associated with rheumatoid arthritis. Hoffman classified the research projects she reviewed according to methodological procedures. These classifications included case and impressionistic, actuarial, factor analytic, correlational, and natural process studies. She then compared the results of the various investigations and related their findings to a proposed grouping of psychological hypotheses.

Hoffman concluded her review, which utilized some 85 references, by stating:

Review of studies that investigated psychological characteristics of individuals with rheumatoid arthritis indicates that
psychological variables are embedded in complex relationships. Unclarified somatic factors and undetermined etiology in relation to the pathogenesis of rheumatoid disease have influenced the direction of previous research. Oversimplified issues and polarization of research focus in terms of a psychogenetic hypothesis in many studies have implied that psychological constructs (e.g., negative feelings, stressful life events) produce arthritis. The latter focus frequently has reflected the belief and interest of the investigators rather than demonstrating whether specific psychological phenomena occur randomly or with significant prevalence in persons with rheumatoid arthritis. (Hoffman, 1974, p. 231)

Hoffman's review attempted to identify research findings that would be supportive or nonsupportive of the role of psychological factors in relation to a proposed grouping of hypotheses according to disease specificity, onset, or course (Meyerowitz's hypotheses, 1966). Specifically, premorbid personality traits in individuals who have developed rheumatoid arthritis were postulated originally by psychodynamic theorists and therapists, and supportive data were obtained primarily from case and impressionistic studies (Cleveland and Fisher, 1954; Cobb, 1959; Cormier and Wittkower, 1957; Johnson et al., 1947; Ludwig, 1954; Thomas, 1936). Specific psychological characteristics identified included inability to express aggression, contained or repressed hostility, and ambivalence toward parental figures—factors found not only in persons with arthritis. Research findings of later studies using the Minnesota Multiphasic Personality Inventory (MMPI) identified classical 'neurotic' profiles for individuals with rheumatoid disease; this also was not unique to individuals with rheumatoid disease (Cohen, 1949; Moos and Solomon, 1964; Nalven and O'Brien, 1964; Polley et al., 1970; Wolff and Farr, 1964). Further the findings of somatic complaint items relevant to the symptoms of arthritis in the neurotic scales of the MMPI by Nalven and O'Brien (1964) and Polley et al. (1970) cast doubt on the validity of neurotic profiles obtained in investigations using the MMPI. In addition, Crown and Crown's (1973) actuarial study of individuals with early rheumatoid disease was nonsupportive of neurotic traits as premorbid characteristics of persons with arthritis.

Alexander et al. (1968) also postulated that the timing of onset of rheumatoid symptoms in a vulnerable individual would be
determined by a concurrent experience of psychological stress. The stress event would serve to intensify preexisting conflicts and dissipate the individual's coping capacities. The precipitating stressful event hypothesis was also primarily supported by life history data obtained from case and impressionistic investigations (Edwards et al., 1964; Johnson et al., 1947; Ludwig, 1954; Robinson, 1957; Silverman, 1970; Thomas, 1936). Inherent in the examination of the disease onset hypothesis in the collection of retrospective data or after the fact of illness onset. Halliday's (1942) interview survey was only partially supportive of the disease onset hypothesis in that only 9 of 20 patients interviewed reported stressful antecedent events to symptom onset. Southworth (1958) found arthritic subjects expressed no relation between emotional experiences and disease onset. While 55 of the 100 subjects in Rimon's (1969) study reported no precipitating event to disease onset.

A few recent studies were relevant to the disease course hypothesis. Rimon's (1969) study showed a relationship between recovery from depression and rheumatological improvement of patients. Wolff (1971) found psychological factors and responses to pain assessed preoperatively predicted post-operative rehabilitation for his subjects. Pain-mood relationships were found to differentiate patients' response to rheumatoid symptoms and rehabilitation following hospitalization by Moldofsky and Chester (1970). A study by Crown and Crown (1973) showed patients with early rheumatoid disease resembled the normal population in psychological characteristics, as measured by the Middlesex Hospital Questionnaire. These studies would be supportive of interindividual variation in psychological responses to rheumatoid symptoms and would offer nonsupportive evidence for postulations of specific premorbid personality traits common to individuals with rheumatoid arthritis. (Hoffman, 1974, pp. 231-232)

At the conclusion of her review, Hoffman (1974) suggested several areas for further research. Among those were predictive studies to identify by psychological factors those containing the rheumatoid factor, investigations of psychological variables related to the disease course and response to treatment, the use of homogeneous subsamples of individuals with rheumatoid arthritis selected according to various clinical variables (for
example, age, sex, age of disease onset, presence or absence of the rheumatoid factor, pain level and reaction, motor impairment and response, slowly progressive versus rapidly progressive disease course, and/or treatment modalities received), and studies designed to identify psychological variables most relevant to actual life experiences of the individual with rheumatoid arthritis.

Results of studies that have used the MMPI to assess individuals with rheumatoid arthritis are largely consistent and show elevated scores on clinical MMPI scales 1, 2, and 3 (Hypochondriasis, Depression, and Hysteria) with secondary elevation on scale 7 (Psychasthenia) (Bourestrom & Howard, 1965; Cohen, 1949; Geist, 1966; Moos & Solomon, 1964; Nalven & O'Brien, 1964; Polley, Swenson, & Steinhilber, 1970; Wolff & Farr, 1964). Elevations on scales 1, 2, and 3 represent the "classical" neurotic triad in MMPI profiles. However, the test results for persons with rheumatoid arthritis were essentially within the normal range (t scores between 30 and 70). An "abnormal" MMPI profile is usually defined as one with scores on one or more than 2.0 standard deviations (SD) from the mean (mean = t scores of 50; one SD represents 10 points). The report by Polley et al. (1970) of 726 individuals with rheumatoid arthritis, who attended the Mayo Clinic between 1962 and 1965 showed the arthritic subjects scored about 1.5 SD above the mean on scales 1, 2, and 3 which represented a difference of less than .5 SD from the mean of their other 52,302 subjects. This degree of elevation for
individuals with rheumatoid arthritis was in agreement with findings by Wiener (1956) and Moos and Solomon (1964).

The neurotic triad is not to be considered abnormal and is not unique to persons with rheumatoid disease; the neurotic overlay obtained from MMPI assessment has been found in individuals with general "neurotic" symptoms as well as persons with varied psychosomatic and other physical illnesses. For example, Bourestom and Howard (1964) found that patients with rheumatoid arthritis, multiple sclerosis, and spinal cord injury had similar MMPI profiles except for slight differences for men but not for women with arthritis.

Geist (1966) summarized MMPI test results of persons with rheumatoid arthritis, using his own findings from subjects (16 males, 14 females) and others (Bourestrom & Howard, 1965; Cohen, 1949; Moos & Solomon, 1964; Wiener, 1956). Comparison groups in Geist's investigation included patients with diabetes, ulcers, and hypertension. In addition to the MMPI, Geist administered two group inkblot tests (Rorschach and Holtzman) and a questionnaire. Two universal psychological elements of patients with rheumatoid arthritis were identified; unexpressed rage and lack of ego strength. Geist's conclusions strongly reflected psychodynamic personality formulations. A relatively small sample (30 subjects) whose mean age was 57.4 years and mean duration of illness was 13 years limited generalizability of Geist's findings to all persons with rheumatoid arthritis.

Moos and Solomon (1964) averaged and compared Cohen's (1949) and Wiener's (1956) findings with their own results which included data from both
male and female subjects with rheumatoid arthritis. The authors of the 
three studies concluded that the common differences between arthritic and 
non-arthritic groups in their investigations were not a function of the physical 
illness alone. Suggestions included that differences could be attributed to 
atitudinal components or emotional disturbances. They also felt that some 
of the differences could be attributed to the inappropriateness of some of the 
test items to individuals with incomparable life situations which would violate 
the assumption underlying the use of standardized tests with norms. Differ­
ences could also be attributed to other variables such as the subject's age, 
sex, IQ, the experimenter's sex, as well as other characteristics operative 
in the situation.

Nalven and O'Brien (1964) attempt to identify items relevant to 
persons with rheumatoid arthritis ("RA-relevant" items) in MMPI statements 
was based on the assumption that item content of the "neurotic triad" scales 
could possibly account for some of the elevation of these scales by patients 
with rheumatoid disease. Test items on scales 1, 2, and 3 contain somatic 
compliant content that is frequently associated with the actual symptoms 
experienced by persons with rheumatoid arthritis. Physicians' judgments 
of MMPI item content for the three scales grouped the statements as "RA­
relevant," "RA-irrelevant," and "RA-indefinite."

Female patients with rheumatoid arthritis showed greater deviance 
from the MMPI normative female group on RA-relevant than on RA-irrelevant 
items. Nalven and O'Brien (1964) concluded that elevated MMPI scales for
persons with rheumatoid arthritis could not be viewed solely as indicative of excessive neurotic tendencies, but must be attributed, at least in part, to subjects' having more actual somatic difficulties to report.

Nalven and O'Brien's (1964) subject population was relatively small (35 females, 10 males). However, Polley et al. (1970) found 34 items in males with arthritis and 17 items in females with arthritis that reflected specific somatic complaints attributable to rheumatoid disease that differed significantly from their other subjects. Since there was some disagreement insignificant differences on individual items found in the two studies, Polley et al. noted that unanimity regarding MMPI statements that are relevant to subjects with rheumatoid arthritis remains to be achieved. However, results of Polley et al.'s findings, impressive because of the number of subjects, (76) lend credence to Nalven and O'Brien's (1964) observation that MMPI profiles obtained from individuals with rheumatoid arthritis should be interpreted with caution.

Assessment of MMPI item content for "hostility-relevant" items and responses to these items by individuals with rheumatoid arthritis (Nulven & O'Brien, 1964) did not support Cobb's (1959) hypothesis of "contained hostility" for persons with rheumatoid disease. Female subjects with arthritis deviated from the MMPI female normative group more on items judged unrelated to hostility than on items judged related to hostility.

Crown and Crown (1973) administered the Middlesex Hospital Questionnaire (MHQ) to a group of male and female patients with early rheumatoid
Taking the direction and magnitude of the mean differences into account compared with control groups, patients with early rheumatoid disease resembled the normal population and were strikingly differentiated from the psychoneurotic population. The authors observed that their findings must be weighed in terms of the relatively simple personality measure used to demonstrate differences between subjects and comparison groups. However, they suggested that the concept of "chronicity" of rheumatoid disease needs critical reevaluation from both medical and psychosocial viewpoints. They feel that research is needed to decide which patients are psychologically vulnerable in response to the disease onset, disease progress, and/or treatment modalities instituted in disease management.

Three studies used Cattell's 12 Personality Factor Questionnaire (16 PF test) in studying psychological traits of rheumatoid arthritics. Moldofsky and Rothman (1970) examined interrelationships between personality description of patients with rheumatoid arthritis measured by the 16 PF test, several parameters of rheumatoid disease activity, and treatment defined by medications subjects received. When compared to test norms, personality profiles of the patients differed in manifested tendencies to low ego strength, anxiety, and dependency. Multivariate data analysis used to compare disease parameters, drug family, and personality traits and treatment with corticosteroid drugs. No overall relationship was found between personality traits and indexes of disease activity. The authors observed that personality differences between patients who had never received corticosteroids versus
those who received the drug may suggest psychologic rather than rheumatologic needs of patients receiving the medication.

Robinson, Kirk, Frye, and Robinson (1971) compared "new" patients (diagnosed for 10 months or less) and "old" patients (diagnosed for more than 3 years) and compared the patients with arthritis with "new" and "old" control groups of patients with diabetes, tuberculosis, and hypertension. The intercorrelations of profiles indicated personality traits found in new and old subjects with arthritis were not wholly specific to the disease and patients with arthritis were similar to new patients with tuberculosis on introversion and to new patients with hypertension on emotional instability. Only the profiles of new and old subjects with arthritis correlated significantly for all within disease categories. The authors concluded that this high agreement of traits for subjects with rheumatoid disease could suggest some personality type which predates the disease and plays a role in the onset and progression of the disease process. They also offered an alternate explanation stating that the pain and crippling associated with arthritis forces patients to a common personality type regardless of their predisease personality characteristics.

In another later study, Robinson et al. (1972) hypothesized than any person who suffers from a chronically painful and disabling disease is likely to demonstrate the "rheumatoid personality" observed by many investigators. New and old subjects with arthritis and new and old patients with chronic pain from causes other than arthritis comprised three other groups. A comparison of overall similarity of the groups was made by intercorrelating the mean
profiles obtained from the 16 PF test scores of all patient groups. Of the 10 profile correlations between patient groups, four were significant, while the remaining six were in the predicted positive direction. The authors concluded that the presence of "neurotic" traits in the diverse groups of patients is supportive of the pain hypothesis. All patient groups with the exception of subjects with arthritis tended to exhibit greater than average levels of anxiety and depression. In contrast to their 1971 findings, the correlations in this study between the personality profiles of old and new patients with arthritis only approached significance. Further, the old patients' personality profiles did not correlate significantly with any other group in the study. This was consistent with Moos' (1964) critical review of research finding and observation that patients with arthritis are characterized not so much by consistent patterns of personality traits which differ from nondiseased normals, but by a greater variability of personality functioning than normals.

Ward (1971), on the basis of his work with the Maudsley Personality Inventory (MPI) on patients with early or chronic rheumatoid arthritis, found that people with rheumatoid arthritis did differ significantly in personality, both from normal people and from neurotic people, but that the differences were more extensive in the chronic arthritics. He suggested that the differences develop as the result of the arthritis.
Hypnosis Techniques and Pain Control

In 1975, a most comprehensive and remarkable book was published by Hilgard and Hilgard. In *Hypnosis in the Relief of Pain*, these two distinguished researchers present a considered assessment of the role of hypnosis in relation to pain as based both on studies in the experimental laboratory and in clinical practice. They show that hypnosis has achieved a significant place despite its alternating history of acceptance and rejection over the years.

The first chapter of the Hilgards' book provides very essential information by giving a brief but comprehensive history of hypnosis, clarifying the concepts of hypnotic responsiveness, and explaining the measurement of hypnotic responsiveness by psychological and physiological methods. They follow this with a clear discussion of the controversies revolving around the issue of hypnosis as a state. The Hilgards summarize the subjective experiences of the hypnotized person in relation to self and to the hypnotist. They stress the necessity for the researcher and the clinician to learn from each other, a necessity too often neglected.

The second chapter is dedicated to a thorough examination of the concepts of pain. The authors point out that, in studying pain, at least three components can be distinguished; sensory pain, suffering, and mental anguish. They state that it is evident that to understand pain fully we must enter the area of social psychology, and go beyond the sensitivity of receptor mechanisms in the nervous system.
The Hilgards then familiarize the readers with the "specificity theory" as contrasted to the "pattern theory" of pain, and with the relatively recent "gate-control theory" of Melzack and Wall (1965, 1970). The production, during traumas, of substances like the bradykinins which are responsible for persistence of certain forms of pain are also considered. In commenting about the "gate-control theory," the authors point out that anatomical and physiological considerations support the idea of two distinct mechanisms— one informative, the other motivational-affective—comprising the total pattern of pain perception. The authors also state that stimulation of large fibers can modify deep persistent pain; and, finally, that central control processes affect the perception of noxious stimuli.

In the third chapter, pain control by drugs and surgery, or by physical methods is compared with psychological methods (behavior modification, operant conditioning, biofeedback, etc.).

The utilization of hypnosis for pain control is discussed in the fourth chapter. Various examples of clinical procedures for hypnotic pain reduction in the laboratory are presented and the relationship between pain reduction and hypnotic responsiveness are carefully examined. For the Hilgards, hypnosis is much more than a placebo; hypnosis and suggestion are not synonymous! Highly responsive S's but not low susceptible ones, obtain a far greater analgesia through hypnosis than by placebo. To the authors it seems paradoxical that, at some levels, the body responds physiologically to signals
of painful stress (changes in cardiac rate and blood pressure) while S apparently enjoys total analgesia.

The authors differentiate between analgesia per se and relief of anxiety, though hypnosis probably reduces anxiety besides producing analgesia. In general, high hypnotizable Ss reduce pain more effectively through hypnotic suggestion than by waking suggestion; low hypnotizable Ss only achieve a placebo effect through hypnotic suggestion. Spontaneous analgesia occurs in cases where hypnosis involves extreme dissociation.

In the second part of the book, the authors review the literature on relief of clinical pain by hypnosis in Cancer (Chapter 5), Obstetrics (Chapter 6), Surgery (Chapter 7), and Dentistry (Chapter 8).

In the third part of the book, several interesting problems are discussed; Chapter 9, Hidden Pain and its Interpretation, Chapter 10, The Future of Hypnosis in Pain Control, Appendix A, Stanford Hypnotic Clinical Scales, and Appendix B, The Availability of Hypnotic Services. Careful indices by author and by subject which follow the appendices provide the reader with most of the recent original experimental and clinical literature in the field of hypnosis and pain (Hilgard & Hilgard, 1975).

In working with pain reduction in the laboratory, several authors have shown that the amount by which pain is reduced correlates with hypnotic susceptibility (Shor, 1959; Hilgard, 1967; Evans & Paul, 1970).

A review by Barber (1963) of hypnotic control of pain is illustrative of reviews that give the false impression that hypnotic analgesia is largely

Knox, Morgan, and Hilgard (1974) showed in their study that highly hypnotizable subjects can reduce both pain and suffering to zero through analgesia suggestions. Evans and Paul (1970) confirmed Hilgard's (1969) findings in the laboratory that hypnosis does not reduce pain unless combined with suggestions for analgesia. A finding of no difference in the effectiveness of analgesia suggestions with and without a prior induction was reported by Spanos, Barber and Lang (1974). And Hilgard (1975) reported finding a difference with induction for highly hypnotizable subjects.

Although the study of pain reduction utilizing hypnosis in the laboratory setting has been of great value in enhancing our knowledge concerning hypnosis, those studies performed in clinical settings seem to be of the most use when working with individuals who are in pain. Hilgard and Hilgard (1975) have reviewed many of the most important studies conducted both in the laboratory and clinical settings. Several studies which seem to have great application to this present study, will now be reviewed in greater detail.

Melzack and Perry (1975) studied the self-regulation of pain utilizing the use of alpha-feedback and hypnotic training for the control of chronic pain. Patients suffering chronic pain of pathological origin received alpha-feedback training methods in association with prior hypnotic training. Changes in the intensity and quality of pain were measured with the McGill Pain Questionnaire. The combined procedures produced a substantial decrease in pain
(by 33% or greater) in 58% of the patients during the training sessions. Both the sensory and affective dimensions of the pain were diminished. The EEG records indicated that the majority of patients learned to increase their alpha output during the training sessions. In contrast, patients who received the alpha training alone reported no decreases in pain even though they showed increases in alpha output. Patients who received hypnotic training alone also produced increased EEG alpha during the training sessions and showed substantial (though not statistically significant) decreases in pain. The results demonstrated that chronic, pathological pain can be reduced in a significant number of patients by means of a combination of alpha-feedback training, hypnotic training, and placebo effects. It was concluded by Melzack and Perry (1975), however, that the contribution of the alpha training procedure to pain relief is not due to increased EEG alpha as such but, rather, to the distraction of attention, suggestion, relaxation, and sense of control over pain which are an integral part of the procedure.

This study resembled an earlier study by Melzack, Weisz and Sprague (1963) which showed that intense auditory input together with strong suggestion that it diminishes pain, produced significant increases in pain tolerance levels; in contrast, the auditory input alone or the strong suggestion alone had no effect. These authors felt that this in no way diminished the importance of the auditory input, rather, it indicated that it must be accompanied by other contributions if it is to have an effect on pain.
Numerous clinical reports cite the usefulness of hypnosis in dealing with pain. It has been shown to be effective in treating patients with terminal cancer (Butler, 1954a, 1954b; Cangello, 1961; Sacerdote, 1965, 1970), in obstetrics (Kroger & DeLee, 1957; August, 1961; Spiegel, 1963), in surgery (Crasilneck & Hall, 1973; Bowen, 1973), and in dentistry (Thompson, 1963; Pulver & Pulver, 1975). Bowen's report is particularly intriguing; a psychiatrist, he used self-hypnosis as the sole anesthesia during his own transurethral resection. He reported on his structuring of pain relief and on his sense of comfort during the procedure—and on the surprise and discomfort of his colleagues.

LaBaw (1973) presented clinical data to support the contention that suggestive techniques are satisfactory adjuncts and treatment choices in the supportive therapy of severely burned children in whom organic and psychic injury are combined. Medical hypnosis was employed as an adjunct in the comprehensive treatment of 23 such children. The patients' difficulty with pain, enuresis, encopresis, and inanition related to poor food and fluid intake was diminished, lessening their morbidity.

Similarly, Schafer (1975) utilized hypnosis with 20 severely burned patients on a modern burn unit. Fourteen of the patients benefited in the control of pain, especially during dressing changes. Half of these were either somnambulists or were capable of enough depth to control pain post-hypnotically. The other half were benefited during the state of hypnosis even though their level of pain control was not as great. This second half
of the successful group found relief via a personalized recording when the hypnotist was not present. The six failures were, with one exception, under the age of 21. Morale, regression, and ward adjustment were improved by the presence of the therapist as both a psychiatrist and a hypnotist. The author concluded that hypnosis can be a very valuable treatment method for the severely burned patient.

Crasilneck and Hall (1973) discussed the management of pain problems which arise when using hypnosis. They recommended caution in treating patients by hypnosis and the need of attention to the organic causes of illness. In their report, they presented several clinical examples of effective pain control utilizing hypnosis and concluded that used with caution, hypnosis is a valuable tool in treating otherwise inapproachable pain and in decreasing many patients' dependence on large doses of medicine.

Cioppa and Thal (1975) reported a case study of the effective use of hypnotherapy in a case of juvenile rheumatoid arthritis. They concluded that hypnotherapy appeared to have initiated an attitudinal change, at a level sufficiently deep to accelerate remission of the rheumatoid condition.

Sacerdote (1970) presented a paper discussing the theory and practice of pain control in malignancy and other protracted or recurring painful illnesses. He found hypnotically induced analgesia and anesthesia to be acceptable as neurophysiological realities in the control of pain. He concluded that these hypnotic procedures utilized neurophysiological mechanisms, psychodynamic changes, establishment of new behavioral patterns or time-space
concepts and percepts as they controlled pain and the human experience of pain. He used a series of case presentations to illustrate some of these multiple psychological and physiological approaches to pain control.

The use of hypnosis in the treatment of severe back pain accompanied by depression is illustrated through the case history of a 29 year old man (Levit, 1973). Although hypnosis was not utilized directly to assist this man in dealing effectively with his pain, it was used to help him discover the origin of deep anger and resentment and thus help him in overcoming these emotions and eliminating his back pain.

Levendusky and Pankratz (1975) reported a case history to illustrate the advantages and disadvantages of self-control procedures for increasing pain tolerance. The patient was taught self-control of his pain through a program of relaxation, covert imagery, and cognitive relabelling. He was then able to be withdrawn from his medication. Follow-up showed the patient to be socially active, without medication, and more successfully controlling his pain.

A Brief Summary of the Review of Literature

In spite of the problems in measuring psychological factors associated with rheumatoid arthritis, the researchers conclude that psychological variables are indeed embedded in complex relationships. Many of the studies implied that psychological constructs produce arthritis. However, several of the researchers found that neurotic traits were not
necessarily premorbid characteristics of persons with arthritis. There were in addition many studies which found that as psychological problems were effectively dealt with, arthritis improvement was also obtained.

Studies utilizing the MMPI were largely consistent in identifying scales 1, 2, and 3 as elevated in individuals with rheumatoid arthritis. However, some of these studies noted that caution should be utilized when interpreting MMPI profiles obtained from individuals with rheumatoid arthritis. Several other studies using similar personality measures, also concluded that individuals with rheumatoid arthritis did in fact differ in personality constructs from other populations studies. One of the most interesting hypotheses growing out of these studies was that of the pain and crippling associated with arthritis forcing patients to a common personality type regardless of their predisease personality characteristics.

Almost all of the studies on hypnosis and pain control indicate that hypnosis has achieved a significant place in the treatment of pain, despite its alternating history of acceptance and rejection over the years. Regardless of the technique used, most studies found that in reducing pain, the more suggestable a patient is, the more success they have. Both clinical and laboratory pain patients were shown by numerous studies to be able to achieve pain control with amount of control being dependent upon technique, suggestibility, and to some extent motivation for pain reduction.

The effective use of self-hypnosis procedures in the control of pain has not been studied to any great extent, although several authors did elude
to the fact that self-help programs offering independency were very desirable (LaBaw, 1969). The literature was also quite deficient of studies offering evidence for or against any significant change in personality of those who are in pain and then able to control their pain. In fact, several of the researchers suggested that trying to compare patients suffering rheumatoid disease with other populations is tenuous at best when examining emotional factors.

The present study was undertaken in an effort to supply the literature with additional information on self-hypnosis procedures in the control of pain and also to examine changes in personality that may result. It was felt that by comparing different groups of patients all suffering from rheumatoid arthritis, that more conclusive and meaningful results could be obtained. The following study has been undertaken to examine the use of self-hypnosis as a viable procedure in controlling pain and any resulting change in personality as measured by the MMPI.
METHODOLOGY

Setting

The study was conducted at the Reynolds Army Hospital in Fort Sill, Oklahoma. Fort Sill is an artillery post which is located in the Lawton, Oklahoma, community. The approximate catchment size of this area is 180,000 people. About 40,000 people are active duty military with the remaining 140,000 consisting of civil service workers, retired military personnel, dependents of military and retired military, and local residents.

Reynolds Army Hospital is comprised of several clinics which exist to meet the medical and psychological needs of the Fort Sill population. Among these clinics are Family Practice, Internal Medicine, Child and Family, and Mental Hygiene. Various professionals representing each of these clinics, formed a special "Pain Clinic" for the purpose of supervision and correlation of this study. All patients participating in this study were first referred to the "Pain Clinic" for the gathering of initial information. They were then referred to various professionals in one of the four clinics named above.

Therapists

The study was supervised by two individuals, Dr. Terry Orme and Dr. William Murchison. Dr. Orme was the Director of the Child and Family Clinic and Mental Hygiene Clinic. Dr. Murchison was the Head of Internal
Medicine and Chief of Medicine. Dr. Orme and Dr. Murchison worked in collaboration throughout the study making sure that patients were treated fairly and professionally. Dr. Murchison was ultimately responsible for the medical needs of the patients, although every patient also had their own physician who followed them during the course of the study.

Six therapists were utilized to conduct the experimental part of the study. Two therapists were Psychiatrists, two were M.S.Ws., one was a PhD in Psychology, and one was an EdD in Psychology. All of the therapists had received training in the uses and practice of hypnotherapy.

Sample

Physicians of the Internal Medicine Clinic and the Family Practice Clinic at Reynolds Army Hospital were asked to identify patients suffering from rheumatoid arthritis. Approximately 50 individuals were identified and referred to the "Pain Clinic."

Professionals in the Pain Clinic reviewed the medical history of each patient noting current medications as well as past medications and treatments utilized in the treatment of the disease.

It had been the writer's original intention to match the patients who were on similar medication equally into each of the three groups. This became an impossibility due to the large number of medications (as many as 7) that each patient was on. The groups were, therefore, chosen in a random fashion. Five of the referred patients declined from being involved in the
study. The names of the remaining patients were put onto slips of paper and placed in a hat. Three secretaries, representing the three study groups, drew names in turn, out of the hat until all subjects had been chosen and the name placed on a list. These three lists were then placed in the hat. The first list drawn out of the hat became the control group, the second list became the modified control group, and the remaining list became the treatment group.

At the beginning of the study, each group had been given 15 members. The control group and the treatment group each lost one member during the course of the study due to military transfers. It, therefore, became necessary to eliminate one individual’s data from the modified control group when doing the statistical calculations. This individual was chosen in a random fashion and the data eliminated.

**Group Description**

The first group served as a control group. Patients in this group were pre-tested at the beginning of the study, mid-tested at a 6 week interval, and post-tested at the end of the study (3 month period). The age range of this group was 30 to 42 years with a mean age of 41.8. Eight members of this group were females and 6 were males. One individual was single, 11 were married, 1 was divorced and 1 was widowed. Six members of the group were active or retired military, 6 were housewives, 1 was a cook and 1 was a librarian. Eight individuals were Caucasian, 3 were Black, and 1 was
Chicano with 2 individuals not specifying their background. The group averaged 8.6 years each in arthritic pain.

The second group served as a modified control group. The patients in this group were also pre-tested at the beginning of the study, mid-tested at a 6-week interval, and post-tested at the end of the study (3 month period). Members of this group ranged in age from 24 to 55 years with a mean age of 37.4 years. Eight members were females and 6 were males. One member was single, 11 were married, and 2 were divorced. Ten individuals were Caucasian, 2 were Black, and 2 were Chicano. Seven members were active or retired military, 4 were housewives, 1 was a salesperson, 1 was a teacher, and 1 was a nurse. This group averaged 5.6 years each in arthritic pain.

The third group was the experimental or treatment group. Patients in this group were pre-tested at the beginning of the study, mid-tested at a 6-week interval, and post-tested at the end of the study (3 month period). The age range of this group was 29 to 66 years with a mean age of 43.8. There were 7 males and 7 females in this group with 1 single, 11 married, and 2 divorced. Nine members were Caucasian, 3 were Black, and 2 were Chicano. Six members were active or retired military, 6 were housewives, 1 was a clerk and 1 was a salesperson. This group averaged 8.8 years each in arthritic pain.

Overall the three groups were comprised of 42 individuals ranging in age from 24 to 66 years with a mean age of 41. Twenty-three individuals were female and 19 were male with 3 being single, 33 being married, 5 being
divorced, and 1 being widowed. Twenty-seven were Caucasian, 8 were Black, and 5 were Chicano with two not specifying their background. Nineteen of the total sample were active or retired military, 16 were housewives, 2 were salespersons, and 1 each cook, librarian, nurse, teacher and clerk. Each individual in this study averaged 7.7 years in arthritic pain, ranging from 1 year to 32 years in pain.

**Procedures**

After the initial history of each patient was taken at the Pain Clinic, they were randomly assigned to one of three groups. Members in all three groups were pre-tested at the beginning of the study, mid-tested at a 6 week interval, and post-tested at the conclusion of the study (3 month period). The tests consisted of the McGill Pain Questionnaire, the Minnesota Multiphasic Personality Inventory, and the California Personality Inventory Well-Being scale items.

The control group individuals were tested as described. They received no treatment during the study or contact with any of the therapists. Technicians gathered all pre, mid, and post-testing data and the individuals' regular physician followed them medically.

The modified control group individuals were pre, mid, and post-tested as described above and were also followed by their individual physicians. They were, in addition, assigned a therapist in either the Mental Hygiene Clinic or the Child and Family Clinic. The therapists were instructed that in
working with members in this group, they could use any talk therapy they felt comfortable with, in an effort to allow the patients an environment for ventilating their angers, frustrations, problems, etc., or for just rapping about their life in general. The therapy sessions were held on a weekly basis for the first 6 weeks of the study for approximately 1/2 hour each week. After the mid-testing was accomplished, the individuals in this group were followed by their physicians in keeping with standard medical procedures.

The treatment or experimental group individuals were pre, mid, and post-tested as described above and also were followed medically by their physician. They were each assigned a therapist in either the Mental Hygiene Clinic or the Child and Family Clinic. They were seen in the clinics on a weekly basis for the first 6 weeks of the study where they received hypnosis instruction with an emphasis in autohypnosis technique. Each of the six therapists followed the same general instructional format in working with their assigned patients. The sessions lasted approximately 1/2 hour each week.

**Instructional Format for the Treatment Group**

a) Jacobson progressive relaxation training of muscle groups of the body.

b) Hypnosis induction and deepening using suggestion and the descending escalator technique.
c) Use of non-specific cognitive imagery (i.e., patient instructed to envision an ideal world or place where it is pleasant, warm, and events occurring that they choose to happen).

d) Specific suggestions as to ability to become free of unnecessary pain, including a post-hypnotic suggestion to be free of useless pain and continued feelings of relaxation and comfort.

e) Specific suggestion as to the technique of self-hypnosis and its use in reducing pain and increasing comfort.

f) Brought out of hypnosis with total recall of experience upon the suggestion of counting up to 5.

g) Brief discussion of hypnosis experience and any associated questions.

h) Encouragement of patients to use self-hypnosis in the treatment of their pain whenever they feel a need. Also encouragement to keep daily records of their pain and their hypnosis practice.

After the mid-testing was accomplished, the patients in this group were terminated from therapy but encouraged to continue using the techniques they had learned. They were also followed medically by their respective physicians.

At the conclusion of the study the patients in the control group and the modified control group were informed of the results of the study. At this time they were offered instruction in the use of hypnosis in the relief of
pain and appointments for hypnotherapy instruction were made with the six therapists.

Medication

Because medication was a dependent variable in this study, every patient was given specific instructions by their physician to take their pain medication only when needed. The patients were followed by their physicians as per normal medical procedure.

Medication taking behavior was surveyed during the pre, mid, and post-testing sessions with each patient. In addition, the hospital pharmacy records and medical charts were reviewed by Dr. Murchison, to further supplement the data on the patients' medication-taking behavior.

Every patient was requested to make a daily record of the medications they took, the intensity of their pain, the number of hours slept, and any unusual symptoms, pains or activities during the day. The patients were asked to log this information on record sheets provided them and to do this on a daily basis.

Instruments

Pain Measurement

The McGill Pain Questionnaire, developed by Ronald Melzack was used to measure the quality and intensity of pain as perceived by the patients during the study. This questionnaire provides the user with three major
measures as well as some survey data. For the purposes of this study, only the Pain Rating Index (PRI), the Present Pain Intensity (PPI), and Pain Description (PD) were used in the statistical comparison of pain between the study groups.

The PRI consists of the sum of the rank values of all the qualitative words chosen in selected subclasses. The PRI scores can be computed separately for the sensory or affective dimensions of pain, or for all the subclasses together. For the purposes of this study, it was determined that computing PRI for all subclasses together would be sufficient.

The PPI is recorded as a number from 1 to 5, in which each number is associated with the following words: 1, mild; 2, discomforting; 3, distressing; 4, horrible; 5, excruciating.

The PD is not one of the scores obtained from the questionnaire, but is instead part of the survey information provided. The patients are asked to choose one word group (each group consists of three descriptive words) to describe their pain.

In correlation studies showing the correlation between PPI and PRI scores before and after treatment, Melzack (1975) found the questionnaire a valid indicator of many of the dimensions of pain. The correlation coefficients between PPI percentage changes and the percentage changes for each of the PRI indices are: Sensory, 0.90; Affective, 0.82; Evaluative, 0.96; miscellaneous, 0.92; Total, 0.94.
These correlations stand in marked contrast to the correlation coefficients of about 0.40 obtained with static pain questionnaire scores. These data indicate that although there is great variability among patients in their designation of a PPI score compared with the specification of pain on the Pain Rating Index, there is an astonishingly high consistency in the patients' determination of changes from a given designated level. This consistency is reflected in the high correlations, which are all statistically significant at better than the 0.001 level of confidence.

Taken together, all correlations are highly significant statistically and indicate an internal consistency among different categories of the PRI and among the three indices in the questionnaire. It is apparent, then, that the questionnaire provides valid indices of many of the dimensions of pain and can be used to determine the effects of different therapeutic manipulations (Melzack, 1975).

**Personality Measurement**

The Minnesota Multiphasic Personality Inventory (MMPI) was used to determine some basic personality descriptions of the patients and any resulting change during the study. The MMPI represents an actuarial method and an outstanding example of criterion keying in personality test construction. It has been used extensively in clinical settings (Dahlstrom, Welch, & Dahlstrom, 1972; Anastasi, 1968) and also has been shown to be an effective instrument in determining personality patterns of rheumatoid arthritics (Polley et al., 1970).
The inventory consists of 550 affirmative statements to which the examinee responds with one of three alternatives (true, false, or cannot say). The MMPI items have been sorted into 10 basic "clinical" scales and three scales relating to validity checks. Numerous experimental scales have also been constructed for various purposes. Since this study was designed to investigate the personality features indicated by scales 1, 2, 3, and 7, these scales will be discussed and reported in greater detail. An MMPI profile of the three groups as they progressed will also be provided to give the reader a feeling for the general personality profile of the three groups.

Scale No. 1 (Hypochondriasis) is a rather direct measure of an individual's degree of concern about his bodily functioning and malfunctioning. In a general sort of way the scale also seems related to a dimension of optimism or pessimism.

Scale No. 2 (Depression) in general is a reflection of an individual's current morale and degree of symptomatic depression. The scale is sensitive to changes in mood and the level of depression, and consequently is useful in determination of this aspect of personality, at least as far as present mood is concerned.

Scale No. 3 (Hysteria) seems to provide an estimate of the general psychology of hysteria, specifically the defensive use of repression and conversion symptoms. The scale is much more a measure of hysteroid personality features than of symptomatic expression.
Scale No. 7 (Psychasthenia) is highly related to conventional measures of neurotic tendency, and appears to be a general measure of anxiety, doubt, rumination, and agitated concern about the self. This scale is frequently elevated by depressed individuals particularly when the depression represents a reaction to feelings of failure in a particular situation or inability to cope with a particular problem.

One further use of the MMPI data was to extract those items used to comprise the California Personality Inventory (CPI) Well Being Scale (Wb). This scale was designed to identify persons who minimize their worries and complaints, and who are relatively free from self-doubt and disillusionment. It was included as a measure in the study because it has been shown that patients suffering from rheumatoid arthritis are usually discouraged and disillusioned and tend to be worriers and complainers (Moos & Solomon, 1965).

**Analysis of the Data**

The data received from the patients during the pre, mid, and post-testing sessions were analyzed statistically using the analysis of variance with repeated measures technique. A graph of each variable, depicting the three different groups' scores obtained from the pre, mid, and post-testing information, was also constructed to indicate any difference or change in that variable.
The 0.05 level of confidence was chosen as the point to represent significance, although the 0.01 level of confidence is also noted when it too represents a significant difference exists.
RESULTS

The results of this study will be presented in three major sections:

(1) Pain Inventory Findings, (2) Personality Inventory Findings, and
(3) Medication Taking Behavior Findings.

The main results are summarized in Tables 1 through 9. Below the presentation of each table is a figure representing the average score of each group observed during each of the three testing sessions. The figures are presented in an effort to better represent the variation of the different variables over time.

Pain Inventory Findings

Table 1 is a summary of the F values and interaction mean values for the Pain Rating Index (PRI) for the three groups observed. A significant change is noted to take place during the three testing sessions. There is also a significant interaction effect.

Both the interaction effect and the change in this variable over time are shown in Figure 1, showing the interaction mean values for each testing sessions for all three groups. As can be seen in this figure, the control and modified control groups perceived pain similarly throughout the study. The treatment group, however, indicated that pain was more intense during the pre-testing sessions, less intense during the mid-testing session, and
about the same as indicated by both control groups during the post-testing session.

Table 2 is a summary of the F values and interaction mean values for the Present Pain Intensity (PRI) for the three groups observed. A significant change is again noted to take place over the three testing sessions for all three groups. The control and modified control groups again perceived pain nearly the same throughout the study. The treatment group perceived pain as more intense at the beginning of the study, about the same as the other two groups at the mid-testing session, and less than the other groups at the end of the study. The treatment group was the only group to change significantly in any direction during the study regarding the PPI. This change as well as the movement of the other two groups during the study is shown in Figure 2 showing the interaction mean values for each testing session for all three groups.

Similar results on the Pain Description (PD) variable were also obtained and are summarized in Table 3 and Figure 3. Again the control and modified control groups responded nearly the same during all three testing sessions as to PD. The treatment group described pain as less constant during the pre and mid-testing sessions and even less constant during the post-testing session than did the other two groups. Again the change that occurred in the reporting of this variable is shown in Figure 3 which shows the interaction mean values for each testing session for all three groups.
All three variables provided by the pain questionnaire indicated the treatment group changed in its perception of pain as the study progressed. The change was always in a positive direction, i.e., less severe, less constant, and generally more bearable.

**Personality Inventory Findings**

Table 4 is a summary of the F values and interaction mean values for Scale No. 1 of the MMPI for the three groups observed. Two areas of significance can be noted, one occurring over time and the other resulting from the interaction of the three groups and the three testing sessions.

Both of these effects are diagrammed in Figure 4, showing the interaction mean values for each testing session for each group. Clearly the modified control and treatment groups are shown reacting differently over the three testing sessions than is the control group. The control group becomes slightly more elevated on Scale No. 1 as the study progressed. The other two groups both significantly decreased in elevation on this scale with the treatment group decreasing slightly more by the end of the study.

Two areas of significance are again noted on Table 5, summarizing the F values and interaction mean values for Scale No. 2 of the MMPI for the three groups observed. Again the significance is a result of the groups scoring differently over time.
Diagrams of the interaction mean values for each testing session and each group are shown in Figure 5. All three groups scored approximately the same on this scale during the pre-testing session. Then, as the control group maintained the same elevation, both the other groups decreased in elevation with the treatment group decreasing slightly more during the mid-testing session. At the conclusion of the study, the modified control group slightly gained in elevation and the control group decreased some so that both of these groups were again very similar. The treatment group, however, significantly decreased in elevation indicating that this group was reacting quite differently than the other two groups.

Table 6 is a summary of the F values and interaction mean values for Scale No. 3 of the MMPI for the three groups observed. Three areas of significance can be noted, one indicating a difference in the groups, another indicating that time made a difference, and third, there was an interaction effect between the groups during the testing sessions.

These effects are diagrammed in Figure 6 and clearly indicate that the variation causing the effect was due to the treatment group as it changed over the three testing sessions. All three groups scored comparatively alike on Scale No. 3 at the pre-testing. The control and modified control group continued to score similarly on this scale at the other two testing sessions, both of them decreasing in elevation very slightly. The treatment group changed significantly, both at the mid-testing session and the post-testing session, decreasing a great deal in elevation on this scale.
The F values and interaction mean values of Scale No. 7 of the MMPI are summarized in Table 7. Again three areas of significance were found, variation in group, time, and interaction of group and time.

The diagram of the interaction mean values for each group and each testing session are shown in Figure 7. The modified control and treatment groups scored very similarly on the pre-test with the control group scoring slightly higher. At the mid-test session, the control group decreased very slightly, the modified control group decreased a bit more, and the treatment group decreased in elevation even more. At the end of the study, the control group was elevated slightly from the mid-test, the modified control group slightly decreased, and the treatment group decreased even more in elevation on Scale No. 7. This would seem to indicate that the modified control and treatment groups were effected similarly on this variable, with the treatment group showing greater change.

The last personality variable, the CPI Wb scale is summarized in Table 8. The F values and interaction mean values for this scale are shown and indicate three areas of significance, group, time, and interaction of group over time.

The interaction effect and change of groups over time are diagrammed in Figure 8, showing the interaction mean values for each group through the three testing sessions. Both control groups scores similarly on this scale throughout the study. Both lost some elevation during the mid-test with the modified control group still losing slight elevation on the post-test and the
control group gaining slightly. The treatment group scored significantly lower on the Wb scale during the pre-testing session. This group gained significantly in elevation throughout the study, scoring slightly below both control groups during the mid-test, and higher than either on the post-test. The data would indicate that while all three groups changed during the study, the treatment group showed a more consistent and significant change on this variable.

The overall personality profiles of the three different groups are shown in Figures 10, 11, and 12. These profiles indicate the basic personality functioning of the three groups as measured by the MMPI during the three testing sessions.

Figure 10 shows that the control group remained relatively stable throughout the study. The modified control group, as shown in Figure 11, changed somewhat during the study, but this was fairly minimal as already has been reported previously. Figure 12, however, shows that the treatment group did undergo a rather marked change during the study. As already has been reported, significant change occurred on Scales 1, 2, 3, and 7. In addition to these changes, there was also a significant change on scales 8 and 10. Both the mid and post-test scores of the treatment group were significantly improved from the pre-test score on these two scales.
Medication Taking Behavior Findings

The last variable reported, medication taking behavior, is summarized in Table 9. The F values and interaction mean values of this variable indicate three areas of significance, group, time, and interaction of group over time.

Figure 9 shows the diagram of the interaction mean values of this variable and indicates an explanation of the variation. The control and modified control groups increased in the amount of medication taken very slightly on the mid-test. Both of these groups maintained this slightly increased rate again on the post-test. The treatment group, however, reacted in the opposite direction and showed a decrease in the amount of medication taken on the mid-test. The same rate was maintained on the post-test, again showing a decrease in the medication taking behavior from what was shown in the pre-test. This decrease accounts for the variation on this variable.
Table 1

Analysis of Variance: Pain Rating Index (PRI)

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Mean Squares</th>
<th>F Test Value</th>
</tr>
</thead>
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<td>0.365</td>
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<tr>
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<td></td>
</tr>
<tr>
<td>Time</td>
<td>2</td>
<td>100.98</td>
<td>8.705**</td>
</tr>
<tr>
<td>Error b</td>
<td>26</td>
<td>11.60</td>
<td></td>
</tr>
<tr>
<td>Group/Time Interaction</td>
<td>4</td>
<td>106.46</td>
<td>8.999**</td>
</tr>
<tr>
<td>Error c</td>
<td>52</td>
<td>11.83</td>
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Interaction Mean Values

<table>
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<th>Pre-test</th>
<th>Mid-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control group</td>
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<td>29.79</td>
<td>30.43</td>
</tr>
<tr>
<td>Modified control group</td>
<td>31.57</td>
<td>31.57</td>
<td>31.57</td>
</tr>
<tr>
<td>Treatment group</td>
<td>40.21</td>
<td>36.64</td>
<td>30.86</td>
</tr>
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</table>

**Significant at 1% level.

Figure 1. Average Pain Rating Index scores (PRI) for each testing session for each group.
Table 2

Analysis of Variance: Present Pain Intensity (PRI)

<table>
<thead>
<tr>
<th>Source of Variation</th>
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<th>F Test Value</th>
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<tr>
<td>Time</td>
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<td>0.50</td>
<td></td>
</tr>
<tr>
<td>Error b</td>
<td>26</td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td>Group/Time Interaction</td>
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<td>10.60**</td>
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Interaction Mean Values

<table>
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<th>Post-test</th>
</tr>
</thead>
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<td>Control group</td>
<td>2.36</td>
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<td>2.36</td>
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<tr>
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<td>2.43</td>
<td>2.43</td>
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**Significant at 1% level.

Figure 2. Average Pain Intensity scores (PPI) for each testing session for each group.
Table 3

Analysis of Variance: Pain Description

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<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Mean Squares</th>
<th>F Test Value</th>
</tr>
</thead>
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<td>Time</td>
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<td>7.33**</td>
</tr>
<tr>
<td>Error b</td>
<td>26</td>
<td>0.027</td>
<td></td>
</tr>
<tr>
<td>Group/Time Interaction</td>
<td>4</td>
<td>0.198</td>
<td>7.33**</td>
</tr>
<tr>
<td>Error c</td>
<td>52</td>
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<td></td>
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Interaction Mean Values

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<th>Mid-test</th>
<th>Post-test</th>
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</thead>
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<td>1.21</td>
<td>1.21</td>
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<tr>
<td>Modified control group</td>
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<td>1.21</td>
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<td>1.64</td>
<td>1.64</td>
<td>2.00</td>
</tr>
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</table>

*Significant at 5% level.
**Significant at 1% level.

Figure 3. Average Pain Description score (PD) for each testing session for each group.
Table 4

Analysis of Variance: MMPI Scale No. 1

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Mean Squares</th>
<th>F Test Value</th>
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<td>Group</td>
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<td>26</td>
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Interaction Mean Values

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<th>Post-test</th>
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<tr>
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<td>66.71</td>
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<td>63.93</td>
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<td>Treatment group</td>
<td>68.57</td>
<td>62.86</td>
<td>62.71</td>
</tr>
</tbody>
</table>

*Significant at 5% level.
**Significant at 1% level.

Figure 4. Average MMPI Scale No. 2 score for each testing session for each group.
### Table 5

**Analysis of Variance: MMPI Scale No. 2**

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Mean Squares</th>
<th>F Test Value</th>
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</thead>
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<tr>
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### Interaction Mean Values

<table>
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<tr>
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<th>Post-test</th>
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</thead>
<tbody>
<tr>
<td>Control group</td>
<td>67.00</td>
<td>66.79</td>
<td>63.71</td>
</tr>
<tr>
<td>Modified control group</td>
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<td>60.50</td>
<td>61.29</td>
</tr>
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<td>Treatment group</td>
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<td>47.64</td>
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**Significant at 1% level.

**Figure 5. Average MMPI Scale No. 2 score for each testing session for each group.**
Table 6

Analysis of Variance: MMPI Scale No. 3

<table>
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<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Mean Squares</th>
<th>F Test Value</th>
</tr>
</thead>
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<tr>
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<td>807.52</td>
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<tr>
<td>Time</td>
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<td>Error b</td>
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<td>Group/Time Interaction</td>
<td>4</td>
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<td>Error c</td>
<td>52</td>
<td>15.50</td>
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</tr>
<tr>
<td>Total</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Interaction Mean Values  
Pre-test    | Mid-test | Post-test |
Control group | 70.57    | 69.07     | 68.93       |
Modified control group | 69.50    | 67.07     | 67.86       |
Treatment group | 68.14    | 61.57     | 54.29       |

*Significant at 5% level.
**Significant at 1% level.

Figure 6. Average MMPI Scale No. 3 score for each testing session for each group.
Table 7

Analysis of Variance: MMPI Scale No. 7

<table>
<thead>
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<th>Source of Variation</th>
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<th>F Test Value</th>
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</thead>
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<td>3.77*</td>
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<td>Time</td>
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</tr>
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<td>Error b</td>
<td>26</td>
<td>22.04</td>
<td>15.16**</td>
</tr>
<tr>
<td>Group/Time Interaction</td>
<td>4</td>
<td>134.77</td>
<td>6.58**</td>
</tr>
<tr>
<td>Error c</td>
<td>52</td>
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Interaction Mean Values

<table>
<thead>
<tr>
<th>Interaction Mean Values</th>
<th>Pre-test</th>
<th>Mid-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control group</td>
<td>61.50</td>
<td>59.86</td>
<td>61.93</td>
</tr>
<tr>
<td>Modified control group</td>
<td>57.50</td>
<td>54.42</td>
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</tr>
<tr>
<td>Treatment group</td>
<td>56.79</td>
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*Significant at 5% level.
**Significant at 1% level.

Figure 7. Average MMPI Scale No. 7 score for each testing session for each group.
Table 8

Analysis of Variance: CPI Wb Scale

<table>
<thead>
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<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Mean Squares</th>
<th>F Test Value</th>
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<td>Time</td>
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<td>51.48**</td>
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</tr>
<tr>
<td>Group/Time Interaction</td>
<td>4</td>
<td>40.47</td>
<td>9.07**</td>
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<td>4.46</td>
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</tr>
<tr>
<td>Total</td>
<td>125</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Interaction Mean Values

Pre-test | Mid-test | Post-test
---|---|---
Control group | 30.93 | 28.43 | 29.00
Modified control group | 32.79 | 30.36 | 29.57
Treatment group | 23.71 | 26.21 | 32.00

*Significant at 5% level.
**Significant at 1% level.

Figure 8. Average CPI Wb Scale score for each testing session for each group.
Table 9
Analysis of Variance: Medications

<table>
<thead>
<tr>
<th>Source of Variation</th>
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<th>Mean Squares</th>
<th>F Test Value</th>
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<td>9.75**</td>
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<tr>
<td>Time</td>
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<td>0.13</td>
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</tr>
<tr>
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<td>0.59</td>
<td>2.02**</td>
</tr>
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<td>Group/Time Interaction</td>
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<td>7.60**</td>
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Interaction Mean Values

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<tr>
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<th>Pre-test</th>
<th>Mid-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
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<td>2.07</td>
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<td>Modified control group</td>
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</tr>
<tr>
<td>Treatment group</td>
<td>2.00</td>
<td>1.57</td>
<td>1.57</td>
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</tbody>
</table>

**Significant at 1% level.

Figure 9. Average Medication Intake reported at each testing session for each group.
Figure 10. MMPI profiles of the control group for each testing session.
Figure 11. MMPI profiles of the modified control group for each testing session.
Figure 12. MMPI profiles of the treatment group for each testing session.
DISCUSSION

The two major objectives of this study were to examine self-hypnosis as a viable method of treatment for chronic pain and also to examine any resulting change in personality of individuals who become better able to control their pain. Both of these objectives were met in the course of this study and a great deal of information regarding hypnosis, pain control, and resulting personality change was generated.

It is only natural to expect that when individuals are better able to control their lives that they will feel more self-confident and healthy. This is indeed what happened in this study as patients suffering from rheumatoid arthritis were taught a method to assist them in controlling the pain in their lives to a greater extent. The individuals who were able to control their pain changed significantly in several different areas. They were able to decrease the amount of medication they were taking, they became less concerned with somatic aspects of their lives, they became more optimistic and enthusiastic with life, and they became less anxious and tense. All of these changes allowed the individuals to be happier and healthier.

One of the important goals of this study was to offer to pain sufferers a technique of control that they themselves could administer and take charge of. Several authors such as Ehrlich (1973), Wiener (1975), and Rimon (1974) had suggested that pain suffering individuals needed emotional support but did not need to be dependent upon others. This study offers a great deal
of credence to the importance of these suggestions by demonstrating that when individuals are given self-help techniques that are effective, they are able to greatly improve their disposition physically and emotionally.

There are several interesting implications that can be made from the information generated from this study. These implications will be discussed at some length in an effort to more fully comprehend their importance as they relate to individuals suffering from chronic pain.

It would seem that as independency of individuals is rewarded several interesting changes in their behavior can be observed, at least in regard to their functioning with pain is concerned: 1) they report a decrease in the intensity of pain and debilitating effects; 2) they are able to decrease the amount of medications they take thereby lessening side effects associated with the medications; and 3) the general level of emotional functioning is increased and appears more normal. This would seem to return to the individuals some of the control that had previously been absent from their lives. One important implication of this study is that individuals who learn and use self-hypnosis to control pain can achieve a greater sense of independency. These individuals were able to provide themselves with a source of relief from their pain as is indicated by the reduction of the Pain Rating Index scores and pain intensity levels of the experimental or treatment group in the study. A reduction in the amount of medication intake was also achieved by the treatment group as well as positive changes in emotionality.
The modified control group also achieved positive changes in emotionality during the study. This group changed during the first part of the study when the group members were being seen by therapists for support counseling. This would suggest that these patients were in need of and responded to the support offered to them by the therapists.

The need of the patients for support can certainly explain some of the change in emotionality observed in the modified control group and the treatment group. However, self-hypnosis as an effective treatment method also seems to have a very influential effect on the changes in emotionality of the treatment group. Evidence of this implication is borne in the fact that after termination with the therapists, the treatment group continued to show positive improvement in emotional functioning as measured on the MMPI scales 2, 3, and 7 as well as the CPI Wb scale. In contrast, the modified control group started to again show elevation on MMPI scales 1, 2, and 3 although some continued improvement on scale 7 was shown.

The continued improvement of the treatment group in regard to their emotional functioning following termination with the therapists gives credence to the importance of independence and the retention of control of one's own life. As LaBaw (1969) stressed, self-hypnosis offers a return of such control to individuals, thus reinforcing their independence and individuality.

Further evidence of this important implication is also born in the continued reporting of lower pain intensity, decrease in frequency of pain, and continued lower medication intake of the treatment group during the
post-testing session. These findings along with the continued increase in emotional functioning, support the notion that self-hypnosis does offer a viable and practical alternative in the control of chronic pain.

Another important implication of this study is the notion that rheumatoid arthritis sufferers are not "emotionally sick" as could be assumed by elevated scores on the neurotic triad of the MMPI, scales 1, 2, and 3. The individuals comprising the treatment group were able to significantly reduce the elevations on these scales to well within normal limits during the study. This would tend to support Nalven and O'Brien (1964) in their conclusion that rheumatoid arthritis patients cannot be viewed solely as individuals with excessive neurotic tendencies but more as subjects having more actual somatic difficulties to report. Further evidence of this fact is indicated by the more significant and continued reduction of MMPI scale 2 and 3 than was seen on scale 1.

MMPI scale 1 is a rather direct measure of an individual's degree of concern with somatic functioning and certainly one would expect individuals in pain to be concerned with somatic functioning. The results of this study indicated that even when individuals were able to achieve a greater degree of control over their pain, they still reported a higher than normal concern with somatic functioning. The fact that the modified control group and the treatment group reacted similarly on this scale throughout the study indicates that the use of self-hypnosis is not as important a consideration with this variable as is the support obtained during the therapy sessions. Both of these
groups dropped in elevation on this scale during the first part of the study, while they were being seen by the therapists. After termination, a slight rise in elevation was noted for both of these groups, contrasted to a continual rise shown by the control group throughout the study. This again would suggest the importance of having someone listen to patients' complaints serving as a vehicle for reducing some of their somatic concerns.

From the results of this study, it is not clear how a process like hypnosis works in aiding individuals in controlling pain. It is clear, however, that the subjects in the treatment group were able to achieve a greater degree of control over their pain and make reductions in their medication intake and emotionality. It is quite possible that, through using a technique such as self-hypnosis, individuals are able to distract themselves from their pain and at the same time achieve a greater sense of relaxation. Both of these elements have proven to be useful techniques when dealing with pain control.

The treatment group differed somewhat from the other two groups in several areas during the pre-testing session. They seemed to have more intense pain and to perceive it as more distracting and discomforting. It is not really clear from the available data if this difference had any significant effect on the results of the study. The treatment group was the only group able to achieve any significant change in perception of pain as indicated by the decrease in PRI, PPI, and PD scores.

The three groups were very comparable as far as personality profiles were concerned. This would seem to indicate that even if the treatment group
perceived pain somewhat more intensely, it had little effect as to emotionality. One might conclude from this inference that pain has an effect on emotionality only to a certain point, then it becomes a moot issue.

This implication brings up a possible limitation of the study. Because of the nature of the sample, it was impossible to do a more long term followup thus offering no information regarding long term changes resulting from the treatment procedures. Each group lost 40 to 50% of their membership, due to transfers, vacations, termination from the service, etc., shortly after completion of the study. Future research with a more stable population would be necessary if this limitation were to be avoided.

Another possible limitation of this study was the apparent unwillingness of the patients to chart a daily record of their pain, medication taking behavior, and unusual activities. Some of the patients were questioned about this lack of cooperation and indicated that their lifestyles and habits negated their meeting with success in this request. Perhaps if the patients had been approached differently about the importance of the charting, more cooperation would have been observed. Another population, possibly in-patients, might provide additional information in these areas.

Although not necessarily a limitation, certainly a point for consideration, hypnotizability or suggestability of the patients needs to be discussed. In most studies of hypnosis, some test of suggestability is administered in an effort to obtain a highly hypnotizable sample. This was not done in this study because of the limited population of rheumatoid arthritis patients and
the need to be random in group assignment. It was felt that demonstration of hypnosis as an actual phenomenon was not the purpose of this study. Rather the purposes were to give individuals in pain instructions and advice in already proven techniques of hypnosis and then encourage the application of these techniques in controlling pain. This purpose was achieved and significant results obtained. It is interesting to ponder though, the implication of more deliberately choosing a sample of highly suggestable rheumatoid arthritis patients and noting their success in controlling pain and possible changes in emotionality. One can only assume that if a random sample of arthritic patients is able to achieve a significant change in these variables, that a screened sample would be even more effective.

A final limitation that needs to be mentioned is that of the subjective nature of obtaining information about pain. By its very nature pain is subjective to the individual and very difficult to standardize. It was felt, however, that by using the same measure throughout the study, that some consistency in perception of pain could be achieved even though it would remain highly subjective. The individuals, then, in effect, became their own controls in the way they reported pain and any resulting effect it had on them.
CONCLUSIONS AND RECOMMENDATIONS

In this study it was found that self-hypnosis offers a viable and practical treatment technique to individuals in the control of their pain. Not only are individuals able to reduce their perception of pain and its effect on their lives, but they were able to be the ones in control of the process. This control gives the individual an increased feeling of individuality and adequacy. They become less dependent upon others and more dependent upon their own skills and resources. The members of the treatment group, through using self-hypnosis to control their pain, were able to increase their emotional functioning and decrease their dependence upon medications. It would appear from the results of this study that when pain is controlled independently by the patient, a change in emotional function is achievable. The subjects who learned the self-hypnosis techniques in controlling their pain were able to significantly change their emotional levels concerning somatic attention, level of optimism and enthusiasm, anxiety and tension, and general sense of well-being.

All three hypotheses can be rejected because there were differences noted between the groups, differences noted as a result of the treatment introduced during the study, and an interaction effect between the groups over the course of the study.

From the findings of this study and the limitations noted, several recommendations for future research are suggested.
1. A study taking into account more detailed information concerning individuals' daily patterns of pain, associated activity levels, and medication taking behavior would provide valuable insight regarding pain perception as well as the way people react to its presence.

2. A long term study of personality changes of those with chronic pain who learn self-help techniques to control their pain compared to a group of chronic pain sufferers who suddenly overcome their pain would also offer valuable information regarding pain perception and associated emotionality factors.

3. A study devised to determine the suggestability of individuals in addition to their success in using hypnosis to control pain and any changes in emotionality might also prove to be very worthwhile.

4. A study utilizing a larger sample of rheumatoid arthritic patients, so that groups could be matched according to medication use, would provide information regarding success of individuals on similar medication in effecting control of their pain with self-hypnosis techniques.

5. A study utilizing a self-hypnosis group and a therapist dependent group could provide additional insight about somatic concerns of patients and how they change in regard to pain control.

6. A study designed to use hypnosis to examine the historical events preceding rheumatoid arthritic onset would be very interesting.

7. A much broader investigation of personality functioning, pain perception and pain control might involve the study of marital happiness,
various reactions to stress, the presence of self-defeating behaviors, etc.,
as they relate to each other.


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