

The Use of Relaxation and Imagery
in the Treatment of Rheumatoid Arthritis

by



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Abstract

22 subjects with either 'classical' or 'definite' rheumatoid arthritis participated in a study designed to determine the effects on medical symptoms of a 6-week relaxation and imagery program, formulated from the literature on holistic medicine (Pelletier, 1977, 1979) and health psychology (Stone, Cohen, & Adler, 1980). Subjects were randomly assigned to either an experimental or control group. A pre-post evaluation included: 1) clinical measures of erythrocyte sedimentation rate, grip strength, range of mobility in worst involved joint, number of effusions, walking time, and active joint count, 2) the State-Trait Anxiety Scale (Spielberger, Gorsuch, and Lushene, 1970), 3) the Multidimensional Health Locus of Control Scales (Wallston, Wallston, and DeVellis, 1978), and 4) a 'value of health questionnaire' (Knutson, 1981). In addition, subjects recorded daily, their self-evaluation of pain and intake of analgesics. All subjects met with experimenter once per week: those in the experimental group for training in relaxation and imagery; those in the control group to discuss their daily pain ratings. The results revealed no significant difference between groups on medical change scores using T-tests and Discriminant Analysis, nor on questionnaire change scores using T-tests. All subjects (n=22) did score significantly lower on 'Chance' locus of control compared to other scales of the MHLC.

Table of Contents

	Page
Abstract	i
List of Tables	1
Introduction	2
Concepts of Health and Disease	4
Concepts of Stress	9
Psychophysiology of Stress	12
Personality and Illness	17
Psychological Factors and Cancer	19
Relaxation and Visualization in Treatment ..	21
Rheumatoid Arthritis	27
Method	
Subjects	31
Procedure	33
Results	36
Discussion	50
References	55
Appendices	63

List of Tables

	Page
1 Between Group T-tests on Pre-Scores	37-38
2 Experimental vs. Control on Medical Change Scores - T-tests	40
3 Experimental vs. Control on Medical Change Scores - Discriminant Analysis	41
4 Experimental vs. Control on MHLC Change Scores	42
5 Experimental vs. Control on S-Anxiety, Pain, and H-Value Change Scores	43
6 T-Tests Between Pre- and Post-Scores Collapsed Over Groups	45-46
7A T-Tests on Pre-Scores of MHLC Scales	48
7B T-Tests on Post-Scores of MHLC Scales	48

Introduction

One of the major chronic illnesses of modern man is rheumatoid arthritis (RA). The frequency of RA, based on limited population surveys in Europe and North America, is in the range of one to three percent (Beeson & McDermott, 1975; Jayson & Dixon, 1974; Pelletier, 1977). Fortunately, most of these people are only mildly affected.

Rheumatoid arthritis usually starts in young adulthood, with the average age of onset being approximately 35, and continues into old age. It strikes three times as many women as men. In the course of the disease, however, spontaneous remissions and exacerbations are commonplace, with remissions occurring more frequently in the early stages (Pelletier, 1977).

The cause or causes of rheumatoid arthritis are yet unknown although several theories are currently receiving attention. The first suggests that the body inadvertently alters its defence mechanisms so as to attack its own joint lining -- the synovium. A second theory proposes rheumatoid arthritis to be directly caused by some type of persistent infection. There are a number of known infections in animals in which the invading organisms enter joints to produce inflammation which is similiar in some respects to rheumatoid arthritis (Jayson & Dixon, 1974; Zvaifler,

1979). A third theory proposes that it is infection which alters the joint tissue so much that the body no longer recognizes it as its own tissue, thereby developing antibodies against the altered joint (Beeson & McDermott, 1975; Jayson & Dixon, 1974; Robbins, 1974). In support of a fourth theory, investigations have tried to define metabolic or biochemical abnormalities in RA. However, although many such abnormalities have been described few could be shown to be limited to RA.

An important factor recognized but not well understood in the development and progression of rheumatoid arthritis is that of stress (Pelletier, 1977). According to Pelletier (1977), stress, as defined by Selye (1956), has been demonstrated to correlate positively with arthritic attacks in those cases where a complete disease history has been available. In addition, personality and behavioral studies have provided further support for the conclusion that rheumatoid arthritis and emotional stress are related (Bayles, 1972; Denver, Grove, Leblond & Latulippe 1979; Hoffman, 1974; Short, Bauer & Raynold, 1957; Toyama, Popell, Evans, Heyder, 1980). This relationship is so evident that rheumatoid arthritis is considered to be one of the major afflictions of modern civilizations -- cardiovascular disease, cancer, and respiratory disease being the other three. This has led Dodge and Martin to state:

These diseases which are very characteristic of our times, namely the chronic diseases, are etiologically linked with excessive stress and in turn this stress is the product of specific socially structured situations inherent in the organization of modern technological societies (Cited in Pelletier, 1977, p. 158).

Concepts of health and disease

So often, according to Pelletier (1977), clinical intervention in disease is governed by a number of assumptions: 1) disease is an outside organic entity that attacks the body, 2) the physicians role is to administer pharmaceutical or surgical intervention, 3) the appropriate treatment for an illness is biochemical, and 4) the knowledge of how to treat is the responsibility of the specialist. Such assumptions are obviously valid in situations such as crisis intervention and treatment of infectious disease. However, the types of illness which the health care system must deal with have altered radically in the past few decades (Bakal, 1979; Glazier, 1973; Holroyd, 1979; Pelletier, 1977; Rachman & Philips, 1978). In 1900, the leading causes of death were infectious diseases but these have been virtually eliminated in the western countries. Contemporary medicine now deals, to a large extent, with chronic disorders and disabilities. For example, in 1968 the likelihood of dying from an infectious disease was one-sixth of what it was in 1900 while the death rate from heart disease has increased by 268%. This

increased emphasis on the prevention and alleviation of "afflictions of civilization" (Pelletier, 1977) requires that considerably more attention be paid to psychosocial variables than has been the case in the past.

Currently, such attention is emphasized by the emerging field of holistic medicine (Bakal, 1979; Jaffe, 1980; Pelletier, 1977, 1979; Shealy, 1978). Holistic medicine sees the mind and body functioning as an integrated unit, with health existing when they are in harmony and illness resulting when stress and illness disrupt this process. Shealy (1978) offers the following definition of holistic medicine:

A system of health care which emphasizes personal responsibility, and fosters a cooperative relationship among all those involved, leading toward optimal attunement of body, mind, emotions and spirit. Holistic Medicine encompasses all safe modalities of diagnosis and treatment including analysis of physical, nutritional, environmental, emotional, spiritual and life style values. Holistic Medicine particularly focuses on patient education and patient responsibility for personal efforts to achieve balance (p.5).

It has been argued that in the process of developing sophisticated medical technology, the healing professions have lost sight of man as a dynamic, integrated and complex system with a capacity for self healing (Carlson & Garell, 1977; Jaffe, 1977, 1980; Pelletier, 1977, 1979; Samuels & Bennett, 1974). Consideration of the whole person

emphasizes the healing process, the maintenance of health, and the prevention of illness, in addition to the treatment of established disorders. Although commonly seen as antagonistic to contemporary medicine, holistic medicine attempts to integrate advances in biomedical research with a more humanistic approach to the individual.

An holistic approach to health and disease by psychologists working in the health field has recently led to the development of a new area of specialization termed 'health psychology'. Defined by Matarazzo (1980) as:

...the aggregate of the specific educational, scientific, and professional contributions of the discipline of psychology to the promotion and maintenance of health, the prevention and treatment of illness, and the identification of etiologic and diagnostic correlates of health, illness, and related dysfunction (p.815),

health psychology, and its' related areas of medical psychology (Masur, 1979; Stone, 1980), psychosomatic medicine (Alexander, 1950; Engel, 1960; Grinker, 1953; Lipowski, 1977), and behavioral medicine (Schwartz & Weiss, 1977), recognize the importance of stress and coping styles, of good communication between patient and health care professional, and place emphasis on positive human adaptive capacities (Adler, Cohen & Stone, 1980).

As suggested by Pelletier (1977, 1979), Jaffe (1977), and Stone (1980), the fundamental principles of holistic medicine and health psychology are best summarized by the following criteria. First, no illness has a single cause. Every aspect of our life affects our defenses against illness: our emotions, beliefs and expectations, relationships, lifestyles, conflicts, as well as diet and the nature of our physical environment. Second, physicians and patients share the responsibility for the healing process. Physicians, and any others within the health care system, must maximize psychological and biological conditions to promote the healing process, and the patient must become an active participant, exercising his volition in regard to his own health and life style. A third characteristic is in seeing symptoms as messages about how we are relating to ourselves (Samuels & Bennett, 1974). Often, symptoms have a symbolic or personal significance, and are related to important events, feelings, life changes or relationships. Fourth, holistic medicine and health psychology suggest that, for a particular individual, specific psychological and biological coping styles may be related to particular physiological imbalances. Emphasis here is on the individual, and does not suggest a personality profile for each disease. Fifth, this approach recognizes that stress may be an important factor in the development and progression of disease in addition to other factors such as infectious agents. Finally, the one

characteristic of holistic medicine and health psychology that may be the most important is the significant alteration required of the attitudes and beliefs most people have about disease. Upon recognizing that he is a participant in the process of healing, an individual is no longer the passive victim of disease nor the passive recipient of a cure.

As of this time, there are no theories or methods peculiar to the field of health psychology, but it draws upon the range of theories and methods of psychology. What sets health psychologists apart from other psychologists is their primary commitment to problems of the health field and their knowledge of the people, settings, and issues of the health system.

Concepts of Stress

Stress research over the past three decades can be classified into one of three complementary approaches. The first approach defines stress as an environmental event which imposes unusual demands of adaptation on the individual (Gunderson & Rahe, 1974). Consistent with this approach has been the work of Holmes and Rahe (1967) on the relationship between life events and disease. Research to date has focused on determining if the occurrence of stressful events requiring heightened adaptation processes will increase the likelihood of subsequent bodily disease. Although such a relationship has been demonstrated the probability of stressful life events resulting in disease is in part dependent on how the individual interprets and copes with such events in his environment. Researchers are increasingly suggesting that the resources available to an individual to help in adapting to environmental change, such as coping skills and supportive relationships, must be evaluated if useful predictions are to be obtained.

A second approach advanced by Selye (1956, 1973, 1974) defines stress as a physiological response of the organism to a stressor. Although stressors, or stress-producing factors, are different, they all elicit essentially the same biological stress response known as the General Adaptation Syndrome (GAS). Activation of the GAS may be experienced as

pleasant or unpleasant, termed eustress and distress, respectively. However, in the development of stress related disorders it is immaterial whether we experience stress as pleasant or unpleasant, all that matters is the intensity of the demand for adaptation. According to Selye, prolonged or repeated elicitation of the GAS lies at the root of a large number of disorders, including cardiovascular, renal, hypertension, peptic ulcers, migraine headaches, and numerous others. Selye's research, however, provided little information concerning the role of psychological processes in determining the physiological stress response.

A third approach to stress (Holroyd, 1979; Wolff, 1950) explicitly focuses on mediating psychological processes. The basic assumption is that mediating processes profoundly influence the physiological state of the organism and thus, the development of stress related disorders. Moreover, recent work of Lazarus (1960; 1978) has suggested that psychological processes mediate between stressors and stress responses and can be conceptualized in terms of the interaction between 'appraisal' and 'coping' processes. Appraisal refers to ongoing evaluations of events in terms of their significance for the person's well-being or in terms of the available resources the individual possesses for responding. Coping refers to activity that is designed to manage or control stress. Using a somewhat different conceptualization, Lipowski (1977) suggests that when an individual is confronted by some environmental event, he

attaches to it a particular subjective meaning depending on his sociocultural background, his personality and his experience. The subjective meaning attached to this event determines the degree to which the individual will be stressed. Different categories of meaning may be threat, gain, loss, challenge, or insignificance. Often, events which have such meaning result in dysphoric emotions such as fear, anxiety, anger, grief, or depression, etc. These emotions and their physiological concomitants play a major role in mediating the effects of environmental events on the function of the body and the possible onset of illness.

Research on the psychophysiology of stress, however, is still attempting to discover the precise mechanisms of how psychosocial events exert their influence on physiological functioning and how unabated psychological duress can lead to a breakdown of the body's coping processes and result in psychosomatic disease.

Psychophysiology of Stress

Current research on the psychophysiology of stress focuses on four major areas: the central nervous system (CNS), the autonomic nervous system (ANS), the endocrine system, and the immune system (Pelletier, 1977; Selye, 1956, 1973, 1974; Solomon, 1969; Solomon, Amkraut & Kasper, 1974). In addition, considerable importance has been attached to the role of the reticular activating system (RAS) in understanding how these four areas interrelate. It has been established (Pelletier, 1977) that the RAS is involved in both cortical and subcortical functions. Since the subcortical areas of the brain control autonomic nervous functions, the RAS provides for an interchange of information between autonomic processes and higher brain centers. Therefore, the influence of a visceral stressor (Selye, 1974) i.e. physical trauma, can be transmitted from the subcortical to the cortical or higher brain centers as well as from the cortical to the subcortical, resulting in various types of responses in other parts of the body. When a stressful event is initially perceived and registered by the cortex, it is transmitted to the hypothalamus (Pelletier, 1977), a subcortical area of the brain. At the same time, the hypothalamus may be receiving information related to the emotional quality of the event from the limbic system (Pelletier, 1977; Solomon, 1969). Once activated by the cortex, the limbic system, or both, the

hypothalamus in turn stimulates the ANS and endocrine systems.

One of the principal functions of the ANS is in the regulation of physiological responses to stressful events. This is achieved by the interplay of both components of the ANS, the sympathetic and parasympathetic systems. The former is involved in general arousal, muscle tension and in activating the endocrine system. The latter is in charge, primarily, of maintaining a state of homeostasis. Once activated, all endocrine glands are important in maintaining resistance to disease. However, it is the adrenal and pituitary glands which are the most important in understanding the psychophysiological basis of stress.

In the initial stages of the stress response, the medulla of the adrenal glands, through sympathetic stimulation, secretes the hormones, epinephrine and norepinephrine. Norepinephrine normally constricts the arteries and raises blood pressure, but has much less influence than epinephrine on blood glucose and heart rate. In addition, epinephrine release, coupled with impulses from the hypothalamus, stimulates the production of adrenocorticotrophic hormones (ACTH) by the pituitary. In turn, ACTH stimulates the adrenal cortex to produce antiinflammatory (glucocorticoids) hormones and proinflammatory (mineralocorticoids) hormones. Most current investigative work (McQuade & Aikman, 1974) seems to

indicate that in acute stress it is epinephrine and norepinephrine of the adrenal medulla which are called into play. In chronic stress, however, the production of corticoids from the adrenal cortex increases and assumes greater importance with their extended presence in the body possibly leading to tissue damage and disease (Selye, 1956; McQuade & Aikman, 1974).

Potentially, one of the most damaging consequences of an excessive level of stress is its effect on the immune system (Selye, 1974). Solomon and his colleagues (1969; 1974), for example, have demonstrated the importance of the thymus gland in the production of T-cells, which in turn are largely responsible for antibody production. Although it is now known (Zvaifler, 1979) that the capacity to respond to an immunogen is dependent on much more than a fully-functioning thymus, Solomon and others (Stein, Schiavi, Camerino, 1976) have demonstrated, in animals, that hypothalamic lesions depress thymus activity and, thereby, interfere with the immune response by reducing the production of T-cells. Furthermore, Selye (1974) and McQuade and Aikman (1974) have found that during prolonged stress there is an increase in corticoid production which leads to thymus shrinkage and a reduction in the potency of immunological defenses.

Research findings with animals is generally supportive of the theoretical link between stress and illness suggested in the human research of Selye (1956), Solomon (1969, 1974), and Stein et al. (1976). For example, in 1955 Turkevich (as cited in Simonton, Mathews-Simonton, & Creighton, 1978) demonstrated that the stressing of experimental animals resulted in the acceleration of the growth of tumors. Moreover, Friedman (as cited in Simonton et al., 1978) has even gone so far to suggest that since so many studies have demonstrated the link between stress and cancer, no further animal research need be undertaken in this area.

Although animal research provides evidence of a relationship between stress and illness, there is a major difference between man and animals in how each responds to, at a behavioral level, a stressful event (Benson & Epstein, 1975; Pelletier, 1977). Generally speaking, an animal can deal with threat through fight or flight. Often, however, such alternatives are not available to man. Animals, by fighting or fleeing, reduce stress, and, thereby, rapidly return to a state of homeostasis. When stress is prolonged and unabated, however, as is often the case with man, the biochemical changes associated with stress are potentially detrimental to health.

When the body fails to adapt or overcome stress, 'diseases of adaptation' (Selye, 1974) can be the result. However, the precise process by which psychosocial stimuli

are converted into physiological stress reactions is still the least understood area of stress research. Furthermore, such factors as genetic predisposition, environment, general health habits, behavioral variables, and past illnesses, all play a role in determining whether illness will occur as a result of prolonged stress.

Personality and Illness

One of the possible preconditions for the onset of psychosomatic illness could be when a baseline level of tolerable stress is elevated to a level of excessive and prolonged stress. Whether or not illness occurs is determined to a very large extent by individual personality characteristics and learned methods of coping with stress. These psychological and behavioral characteristics are clearly integrated into the adult personality and determine the way the individual manages stress throughout life.

The idea of a relationship between personality and health is not new. Recent research, however, has demonstrated the importance of learning more about this relationship. Friedman and Rosenhan (1974), for example, have demonstrated a strong correlation between behavior patterns and cardiovascular disease. These positive findings were largely due to their emphasis on behavioral assessment, as opposed to the traditional, trait and psychodynamically based, assessment procedures, for identifying psychological factors (Holroyd, 1979).

According to Pelletier (1977) further evidence is accumulating that personality factors may be associated with cancer, arthritis, ulcerative colitis, asthma, migraines, and other disorders considered by many to be, at least in part, psychosomatic or stress induced. However, there is no

convincing evidence of specific personality characteristics being associated with any particular disease, i.e. 'cancer personality' (Bakal, 1979). Still, as Pelletier suggests, researchers have studied the role psychological factors play in the onset and course of many diseases.

Psychological Factors and Cancer

A link between cancer, attitudes, and emotions has been suspected throughout history. Galen in the second century, Burrows (1783), Walshe (1846), and Snow (1893) all postulated that certain behaviors or attitudes toward life were associated with cancer (Simonton et al., 1978).

In the present century there has been a great deal of research which has investigated the relationship between personality and cancer. One major line in this research was established by Evans (1926) with his finding that many cancer patients had lost an important emotional relationship before the onset of disease. LeShan (1956, 1961, 1966, 1977), a prolific researcher, expanded on Evans' findings. In interviews with over 500 cancer patients, LeShan formulated 4 hypotheses about their life history, each of which has received varying degrees of support by other researchers. The first two hypotheses, that the patient's youth was marked by feelings of neglect, isolation, and despair, and that this despair was 'bottled-up', were supported by Thomas and Dusynski (1974). A third hypothesis suggesting cancer patients tend to be prone to feelings of helplessness and hopelessness, even before the onset of cancer, was supported by Schmale and Iker (1971) and by Greene (1966). Other studies by Kissen (1963, 1964, 1966, 1967, 1969), and Blumberg (1954), and Klopfer (1957), have

provided support for the fourth hypothesis of Leshan's that many cancer patients experience difficulty in expressing negative feelings and exhibit a need to constantly look good to others.

More recent work by the Simontons (1975, 1978) has also verified some of the LeShan findings. The Simontons have found that most patients recall having had feelings of helplessness and hopelessness some months prior to the onset of disease. This giving up on life, the Simontons believe, plays a major role in interfering with the immune system and may, through changes in hormonal balance, lead to an increase in the production of abnormal cells. Furthermore, the Simontons believe that if negative feelings of despair, hopelessness and helplessness or giving up, can encourage the development of cancer, then the positive feelings of hope, or the will to live, can aid in restoring the proper functioning of the body's immune system.

Relaxation and Visualization in Treatment

The Simonton's (1975, 1978) developed a six-week treatment program for cancer patients designed to affect the patient's attitude toward living, and toward his cancer. Although each patient participates in individual counselling and continues to receive medical treatment throughout the program, there are sections of the program which make it distinctive. First, the Simonton's describe to patients how certain reactions to stressful situations can influence the body's immune reaction and endocrine system. It is hoped that this will help the individual to become more aware of the role he plays in his own disease process.

Secondly, patients are taught relaxation and the use of imagery. This technique begins with teaching the patient how to achieve deep relaxation, followed by an instruction to imagine a peaceful scene. Next the patient is told to imagine his cancer and to picture his immune mechanism, the white blood cells, picking up the dead and dying cells which have been weakened or killed by the barrage of high energy particles of radiation therapy. These dead cells are then flushed out of the body through the excretory system. Finally, the patient is instructed to visualize himself well.

Visualization is possibly one of the oldest healing techniques known to man, dating back hundreds of years (Samuels & Samuels, 1975). Priests of the ancient civilizations of Babylonia, Assyria, and Egypt frequently used visualization as a healing technique. In fact, Hartman (as cited in Samuels & Samuels, 1975) reported that up until the 1500's the belief in the ability of thoughts to heal prevailed among the community of 'physicians'. Between the sixteenth and nineteenth centuries, however, little attention was paid to visualization, since the efforts of physicians were focused on controlling infectious diseases.

Since 1900, however, scientists and physicians have begun to explore the extent to which the mind can influence bodily processes, and to gain greater insight into phenomenon such as 'spontaneous remissions of cancer', the 'placebo effect' (Benson & Epstein, 1975; Frank, 1973, 1975), 'taboo death' (Frank, 1975; Samuels & Samuels, 1975) and so on. One significant methodological approach to understanding the mind-body relationship can be found in Jacobson's (1929; 1970) work on progressive relaxation. An understanding of the importance of relaxation, however, did not really become clear until the late sixties with the work of such researchers as Benson (1974, 1975, 1975). Benson found that relaxation is accompanied by physiological responses which are the opposite of the fight or flight response. Decreases in oxygen consumption, blood lactate, and heart beat, as well as lowering of blood pressure and

intensification of alpha brain waves, are all common to what he has termed 'the relaxation response'. Although Benson was one of the first to systematically study the effects of the relaxation response, methods of inducing relaxation are numerous and come under such headings as autogenic therapy (Luthe, 1979; Shultz & Luthe, 1959), progressive relaxation (Jacobson, 1929, 1970), the quieting response (Stroebe, 1978), and Yoga, Zen and Transcendental Meditation (Samuels & Samuels, 1975).

For years the ability of yogas to control specific bodily functions such as heart rate and metabolic rate has been known. Miller (1969) has shown that some degree of voluntary control of the sympathetic nervous system can be learned and Green and Green (1970; 1977) have verified the ability of yogas to control specific bodily processes. Learning to relax voluntarily, therefore, may have a role in treating diseases that are attributed to prolonged excitation of the sympathetic nervous system (Beary & Benson, 1974).

In addition to relaxation, visualization techniques have been used for healing both by affecting body physiology in a general way, i.e. the relaxation response, and in a specific way, such as increasing blood flow to one area of the body (Luria, 1968). In the 1930's, a technique known as 'autogenic therapy' (Shultz & Luthe, 1959) was developed which utilized both general and specific visualization

techniques. This approach used a series of standard visualization exercises to facilitate self regulating processes thought to be important in helping patients recover from illness. This therapy requires the patient to adopt a state of passive concentration and develop the capacity to visualize peaceful scenes. As the patient develops the ability to engage in imagery he is then required to go through a series of visualization exercises directly related to body physiology. Following these exercises the patient may then be required to go through a series of meditation exercises.

According to Pelletier (1977) and Samuels and Samuels (1975) autogenic training profoundly affects body physiology by causing the hypothalamus to moderate the ANS activity. Theoretically, this reduction in ANS activity initiates a move toward homeostasis and the onset of healing physiological changes even to the point of affecting specific organs or physiological processes. Evidence (Pelletier, 1977), primarily anecdotal, suggests that autogenic training has been helpful in treating ulcers, heart attack, obesity, angina, high blood pressure, headaches, asthma, diabetes, arthritis, and even low back pain.

Visualization, as discussed so far, may be categorized as either receptive or programmed. Receptive visualization in healing may be concerned with becoming aware of feelings

concerning an illness, determining the cause of an illness, diagnosing an illness, or determining things that will help in its treatment (Samuels & Samuels, 1975). Programmed visualization as described by Samuels and Bennett (1974) and the Simontons (1975; 1978) may involve making rough areas smooth, i.e. certain forms of arthritis; hot areas cool, or the elimination of infection. Thus, images deal with a process, such as visualizing cancer cells being carried off by white blood cells, or with a final state, such as visualizing oneself recovered and healthy.

The Simontons feel that relaxation and mental imagery are excellent tools for creating and reinforcing patients beliefs in their ability to recover from cancer. The relaxation technique is designed to break the cycle of tension and fear so common among cancer patients. In addition, many patients discover that their psychological perspectives change when they are able to relax, permitting them to cope more effectively with their lives and their disease. Moreover, by engaging in mental imagery, the patient is able to create positive changes in his expectancies, giving him a major role in his own treatment and in assuming some responsibility for his recovery. The Simontons suggest their methods may be employed no matter what the illness, since they consider any illness, including arthritis, to be a signal of a lack of unity between mind and body (Simonton & Simonton, 1978).

In their study of 152 cancer patients at a major Air Force medical facility (Simonton & Simonton, 1978) the Simontons found that those with positive attitudes (how cooperative and enthusiastic they were in the Simonton program) had better responses to treatment than those with negative attitudes. The study was conducted by five staff members who rated patients on their attitude toward treatment and evaluated their responses to treatment. Nine of nine patients who followed instructions implicitly and were enthusiastic about getting better, showed marked relief of symptoms. Of those who rarely followed instructions only two showed some relief of symptoms while 19 showed no relief. The Simontons believe that these results strongly support their argument that patients who develop positive expectancies about their disease and its outcome have an overall better prognosis than those with negative expectancies.

Rheumatoid Arthritis

Research devoted to rheumatoid arthritis (RA) has focused primarily on four areas. First, there is a body of literature devoted to biological etiology. Robinson (1969), in a literature review, failed to show that RA was caused solely by infection, metabolic dysfunction, nutritional change, endocrine aberration, or fluctuation of the autonomic nervous system. The findings from more recent work in the area of autoimmune dysfunction (Ruddy & Colten, 1974) are also contentious. A second area of research focuses on psychological causes and the concept of an 'arthritic personality'. Hoffman (1974), in an extensive review of the literature, however, has shown that there is no consistent support for the notion of a specific premorbid personality type in rheumatoid arthritics. On the other hand a third research area emphasizing an association between illness onset and course and psychosocial variables is supported by a number of studies. Cobb, Bauer, and Whiting (1939), Edwards, Calabro and Weid (1964) and Halliday (1942), all found environmental stress to be related to the onset and exacerbation of RA, while Short, Bauer and Raynold (1957) showed that both mental and physical strain was a common precipitant of RA. Also, Rimon (as cited in Hoffman, 1974) found a relationship between recovery from depression and rheumatological improvement, and Wolff (1971) found that psychological factors and response to pain assessed

preoperatively predicted post operative rehabilitation progress. Finally, Bayles (1972) reviewed studies suggesting that emotions may affect the autonomic nervous system either directly or indirectly through the endocrine system and thus produce increased muscle tension, vasospasm, or metabolic changes in various organs and structures.

A fourth area of RA research has recently developed within the context of behavioral medicine. Denver, Grove, Leblond, and Latulippe (1979) designed a study to explore the influence of short term temperature biofeedback on the day to day management of the medical and psychological factors associated with the clinical symptoms of RA. The most important findings were that pain and stiffness intensities were generally redistributed so that five of seven subjects spent less time experiencing intense symptoms but more time in experiencing feeble symptoms. Additional changes were reductions in erythrocyte sedimentation rate for five of seven subjects, and an overall reduction in medication frequency for arthritis-related drugs. Researchers have concluded that this form of biofeedback, although not meant to replace pharmacotherapy, deserves further exploration as an adjunct to the treatment of RA.

Falling into this fourth area of research, the present study was designed to apply relaxation and imagery techniques, as applied in the treatment of cancer (Simonton et al., 1975, 1978), to the treatment of RA. Given the

foregoing discussion describing the influence of psychological factors on the course of disease, it was hypothesized that the use of relaxation and imagery would significantly reduce medical symptoms associated with RA. Moreover, in an attempt to understand the attitudes and beliefs of RA patients toward their health as well as possible changes that may occur as a result of treatment, the following questionnaires were administered: 1) the Multidimensional Health Locus of Control (MHLC), 2) the State-Trait Anxiety Inventory (STAI), 3) a pain rating inventory, and 4) a Value of Health Questionnaire.

The MHLC (Wallston, Wallston, Kaplan & Maides, 1976; Wallston, Wallston & DeVellis, 1978) measures individuals health locus of control beliefs as primarily internal (IHLC) i.e. one stays or becomes healthy or sick as a result of one's own behavior; a matter of chance (CHLC) i.e. luck, chance or fate determine illness or health; or under the control of powerful others (PHLC) i.e. health care professionals, family, etc.

The use of the MHLC had two objectives: 1) to assess any possible differences in perceived control between experimental and control groups due to treatment, and 2) to examine how individuals with diagnosed RA perceive control over their health and illness.

Concerning the STAI (Spielberger, Gorsuch, & Lushene, 1970), it was hypothesized that the State-Anxiety Scale would decrease over time due to treatment. According to Spielberger et al. (1970), state anxiety is characterized by consciously perceived feelings of tension and heightened autonomic nervous system activity, both of which are reduced by relaxation training. On the other hand, it was hypothesized that trait anxiety as measured by the STAI would not change significantly since trait anxiety refers to a relatively stable individual difference in anxiety proneness (Spielberger et al., 1970).

It was also hypothesized that the use of relaxation and imagery would significantly reduce the self reported pain ratings of the experimental group regardless of changes in medical measures, since psychological approaches to pain relief i.e. relaxation therapy, are able to produce some measure of relief (Melzack, 1977).

Finally, a measure of health value (Knutson, 1981) was included since a significant difference between groups on this measure would have to be taken into consideration in explaining differences between the groups on the medical, State-Trait, and MHLC change scores (Wallston & Wallston, 1980).

Method

Subjects

Approximately 100 RA patients were assessed in order to obtain 22 subjects, who were randomly assigned, using the alternate method, to either an experimental (N=10) or control (N=12) group. Unequal N's were due to one experimental male subject being discarded, since it was discovered he had been admitted to the study in error, not having met three of the four criteria, and one experimental female subject who dropped out after one session. Of these 22 subjects, 4 were categorized as 'inpatients' and 18 as 'outpatients', with subjects in each category being randomly assigned to either the experimental or control group.

'Inpatient' was defined as an overnight patient enrolled in a 3-week intensive therapy program for rheumatoid arthritis. Intensive therapy included: 1) Occupational Therapy Educational Sessions: a) the use of therapeutic aids, b) assessments in homemaking and activities of daily living, and c) instructions in these areas where necessary; 2) Physio Modalities: a) hot packs and ice, b) exercise, c) splinting, and d) pool therapy; and 3) medical therapy.

'Outpatient' included those who entered the clinic on a somewhat irregular basis receiving brief physical therapy, i.e. 2-3 times per week.

Although most 'inpatients' and 'outpatients' were using prescription medication to combat pain, swelling and inflammation, there was a definite attempt to keep other forms of medical therapy; i.e. gold and cortisone; constant during their involvement in the study.

All subjects met the American Rheumatism Association criteria for classic or definite rheumatoid arthritis (Rodnan, 1973). Moreover, 3 of the following 4 criteria for active disease were met by each subject: 1) 30-45 minutes of morning stiffness, 2) 15 painful joints, 3) 7 swollen joints, 4) erythrocyte sedimentation rate (ESR) of 28mm. Thus, sufficient inflammatory activity was present in each subject at the onset, to allow possible observation of improvement in disease activity, following 6 weeks involvement in the study.

All subjects were obtained through the cooperation of the Port Arthur Clinic and St. Joseph's Hospital of Thunder Bay, Ontario, Canada.

Procedure

Subjects who met the necessary criteria for admission into the study were first asked to complete a consent form (Appendix A). Following this each subject was given a medical examination plus the Multidimensional Health Locus of Control Scale, the State-Trait Anxiety Inventory, and a Value of Health Questionnaire. Also, each subject was given a pain-rating form to record daily pain ratings for 6 weeks. After a six-week interval all subjects were again given a medical examination followed by the questionnaires, in the same order each time. In the 6-week interval, experimental subjects participated in a relaxation and imagery program, while control subjects met with experimenter to discuss pain ratings. Following the conclusion of the study subjects were given a debriefing session.

Medical Examination. A comprehensive medical evaluation of the rheumatologic condition was administered to all subjects, experimental and control, prior to and upon termination of the study. Included were measures of: 1) erythrocyte sedimentation rate, 2) right and left hand grip strength, 3) range of mobility (extension and flexion) in worst involved joint, 4) 50-foot walking time, 5) number of effusions, and 6) active joint count. Examinations were administered using a double-blind procedure. Specifically, all medical evaluations were made by the same Occupational

Therapist who was unaware of which group the subjects were assigned. Ongoing medical treatment was maintained throughout the course of the study.

Locus of Control Scale. The Multidimensional Health Locus of Control (MHLC) Questionnaire was administered to both the experimental and control group subjects, prior to and upon termination of the study. The experimenter remained blind to these questionnaires until the study was completed (Appendix B).

Value of Health Questionnaire. A 7-point value of health questionnaire (Knutson, 1981) was administered pre and post treatment to assess value of health. Again the experimenter remained blind to these questionnaires until the study was completed (See statement 2, Appendix C).

State-Trait Anxiety Inventory. Using a similar procedure, the State-Trait Anxiety Inventory (Spielberger, Gorsuch, and Lushene, 1970) was administered to all subjects, prior to and upon termination of the study, in order to assess changes in state anxiety levels, and to assess stability of the trait score (Appendix D).

Relaxation and Imagery Program. The experimental group, in addition to receiving the medical evaluation and questionnaires, participated in a 6 week program of relaxation (Stroebe, 1978) and imagery (Simonton, Mathews-Simonton & Creighton, 1978). Subjects met with the

experimenter once per week. In addition they were instructed to practice relaxation and imagery twice daily on their own, with the aid of a tape recorded protocol (Appendix E).

Self Evaluation. Both experimental and control subjects were asked to record, once each day for six weeks, their overall intensity of pain and usage of over-the-counter medications; i.e., analgesics. Subjects rated their perception of pain on a 4-point scale (Keele, 1948) (Appendix F). Moreover, this self-rating scale and record of medication was the focal point of a weekly meeting with control group subjects (Appendix G). This weekly meeting was an attempt to control for the variable of 'attention', since experimental subjects were meeting the experimenter once per week.

Results

All statistical analyses were conducted using the SPSS system of computer programs (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975). This system was programmed to make necessary adjustments per missing data (Appendix H).

In order to determine whether there were any differences between the experimental and control groups on pre-scores, t-tests were conducted on all variables. Significant differences on any variable would have to be considered in explaining further findings on this variable. Results indicated no significant differences due to age, duration since first diagnosed (DURA), internal locus of control, or chance locus of control. A significant difference was found between experimental and control groups on powerful others locus of control ($t=-2.18$, $p<.05$), indicating that subjects in the experimental group began the study with a significantly lower belief in the ability of powerful others to determine their health or illness. No significant differences were found on the remaining dependent measures of health value, state-anxiety, trait-anxiety, erythrocyte sedimentation rate, right and left hand grip strength, extension and flexion in worst involved joint, 50-Foot walking time, number of effusions number of active joints, and pain. The means, standard deviations and t-values for these pre-scores are presented in Table 1.

Table 1

Between Group T-tests on Pre-scores

	N	Mean	SD	t-value	2-tail Prob.
AGE					
Exp	10	53.700	11.451	0.25	.806
Cont	12	52.500	11.058		
DURA					
Exp	10	11.400	9.419	0.29	.775
Cont	12	10.250	9.087		
Internal					
Exp	10	24.700	4.692	0.69	.501
Cont	11	23.090	6.024		
P-Others					
Exp	10	21.700	5.314	-2.18	.044*
Cont	11	26.181	3.920		
Chance					
Exp	10	17.400	5.296	0.65	.525
Cont	11	16.000	4.517		
H-Value					
Exp	10	6.700	0.483	0.97	.345
Cont	11	6.363	1.027		
S-Anxiety					
Exp	10	37.900	13.626	0.17	.867
Cont	12	36.833	15.896		
T-Anxiety					
Exp	10	37.600	13.142	-0.10	.924
Cont	12	38.083	9.376		
ESR					
Exp	10	49.600	17.513	0.09	.929
Cont	12	48.916	17.825		
R-Grip					
Exp	10	111.000	78.662	0.82	.422
Cont	12	86.500	56.241		
L-Grip					
Exp	10	83.400	48.121	0.02	.986
Cont	12	83.000	58.772		

Extension					
Exp	9	11.333	19.994	-0.37	.716
Cont	11	14.454	17.114		
Flexion					
Exp	9	83.000	29.833	0.98	.340
Cont	11	67.545	40.542		
Walking					
Exp	9	14.555	7.568	0.56	.586
Cont	10	13.000	3.621		
Effusions					
Exp	10	1.700	2.058	-1.50	.152
Cont	12	3.833	4.366		
A-Joints					
Exp	10	32.800	8.779	-0.44	.663
Cont	12	34.750	11.879		
Pain					
Exp	10	15.500	3.749	1.11	.283
Cont	11	13.000	6.340		

Two separate statistical analyses were used to test the primary hypothesis that relaxation and imagery would significantly alter the medical measures of erythrocyte sedimentation rate, grip strength, extension and flexion in worst involved joint, 50-Foot walking time, and number of effusions and active joints. First, between group t-tests using change scores were performed to look for differences between the experimental and control groups on each individual medical measure (Table 2). Second, a discriminant analysis (direct method) using change scores was performed to distinguish between experimental and control groups on cumulative medical measures (Table 3). Whereas t-tests looked at each medical measure individually, discriminant analysis enabled changes on each medical measure to be combined so as to determine if there was an overall difference, thereby making it possible to distinguish between experimental and control groups. Both analyses revealed no significant differences between groups, indicating no effect for the relaxation and imagery treatment with these subjects.

Table 2

Experimental vs. Control on
Medical Change Scores

	N	Mean	SD	t-value	1-tail Prob
ESR					
Exp	10	-1.900	14.379	.91	.187
Cont	12	-9.583	24.615		
R-Grip					
Exp	10	11.900	42.699	1.13	.139
Cont	12	-5.333	24.773		
L-Grip					
Exp	10	.100	22.708	.43	.336
Cont	12	-4.833	31.051		
Extens'n					
Exp	10	.300	.675	.53	.303
Cont	12	-.583	5.696		
Flexion					
Exp	10	-4.100	6.999	.89	.192
Cont	12	-6.833	7.383		
Walking					
Exp	10	9.600	25.374	.36	.360
Cont	12	5.750	24.069		
Effusions					
Exp	10	-0.600	2.319	-.93	.183
Cont	12	.666	3.985		
A-Joints					
Exp	10	5.300	12.859	-1.12	.142
Cont	12	10.333	6.624		

Table 3

Experimental vs. Control on
Medical Change Scores

Discriminant Analysis Summary Table

Canonical Corr.	Chi-Squared	D.F.	Significance
.500	4.6086	8	0.7985

In order to determine whether or not the experimental treatment resulted in differences between the experimental and control group on the internal, chance, and powerful others locus of control, between group t-tests using change scores were performed. The results, presented in Table 4, indicated that the groups did not differ from each other on any of the measures.

Table 4

Experimental vs. Control on
MHLC Change Scores

	N	Mean	SD	t-value	2-tail Prob.
Internal					
Exp	10	1.900	4.408	.31	.759
Cont	12	1.416	2.314		
Chance					
Exp	10	1.000	3.725	-.37	.713
Cont	12	0.666	3.312		
P-Others					
Exp	10	-0.500	2.068	1.08	.295
Cont	12	-1.416	1.881		

The hypothesis that state anxiety would be reduced for the experimental group was tested by between group t-tests on change scores, the results of which were not statistically significant (Table 5). The hypothesis that trait anxiety would not change was tested using the difference between the pre and post scores (Table 6). The t-test revealed no significant differences between groups confirming the stability of the trait anxiety measure.

Table 5

Experimental vs. Control on
S-Anxiety, Pain, and Health Value Change Scores

	N	Mean	SD	t-value	1-tail Prob.
S-Anxiety					
Exp	10	1.600	6.753	-.95	.178
Cont	12	6.083	14.588		
Pain					
Exp	10	0.000	6.782	.14	.444
Cont	12	-0.416	6.973		
H-Value					
Exp	10	.400	.516	1.49	.153
Cont	12	.000	.739		

To determine whether the experimental and control groups differed on self-reported pain ratings, a t-test using change scores was conducted (Table 5). This analysis revealed no significant differences, indicating no effect of relaxation and imagery on perceived pain.

The analysis of health value change scores, which was included to look for differences between experimental and control groups, was performed using t-tests (Table 5). The t-values were not statistically significant and, therefore, health value need not be considered in explaining other findings.

With the exception of the trait anxiety analysis, the preceding analyses looked at differences between the experimental and control conditions on various measures, whereas the following analyses look at subjects as a single group (n=22). In addition to assessing changes irrespective of group, it was expected that the findings of these analyses would be helpful in explaining the results of other analyses.

First, to look for differences between pre- and post-scores on each measure (i.e. medical, MHLC, State-Trait, and pain), t-tests were conducted (Table 6). Subjects, showed significant improvement on the medical measures of flexion ($t=-3.77$, $p<.001$) and active joint count ($t=3.77$, $p<.001$). Also, there were significant differences between pre-post internal ($t=2.31$, $p<.05$) and pre-post chance ($t=-2.39$, $p<.05$) locus of control, with the means decreasing for internal and increasing for chance. This suggests that the 22 subjects became less internal; i.e., had less of a belief in themselves as having control over their health and illness; and more chance; i.e., had a stronger belief in fate or luck as being responsible for their health and illness. None of the other t-tests revealed significant differences.

Table 6

T-Tests Between Pre- & Post-Scores

Collapsed Over Groups

Variable	N	Mean	SD	t-value	2-tail Prob.
Internal					
Pre	21	23.857	5.360	2.31	.032*
Post	21	22.142	6.590		
P-Others					
Pre	21	24.047	5.064	0.56	.583
Post	21	23.619	5.258		
Chance					
Pre	21	16.666	4.830	-2.39	.027*
Post	21	17.714	5.386		
H-Value					
Pre	21	6.523	0.814	1.28	.214
Post	21	6.333	0.856		
T-Anxiety					
Pre	22	37.863	10.960	0.66	.517
Post	22	37.000	9.981		
S-Anxiety					1-tail Prob.
Pre	22	37.318	14.568	1.63	.099
Post	22	33.272	10.213		
ESR					
Pre	20	48.800	17.065	-0.61	.275
Post	20	50.950	22.663		
R-Grip					
Pre	22	97.636	66.818	0.34	.368
Post	22	95.136	46.211		
L-Grip					
Pre	22	83.181	52.932	-0.45	.329
Post	22	85.772	48.439		
Extension					
Pre	20	13.050	18.028	-0.20	.420
Post	20	13.250	18.203		

Flexion					
Pre	20	74.500	36.084	-3.77	.000***
Post	20	80.650	35.204		
Walking					
Pre	19	13.736	5.714	0.14	.446
Post	19	13.636	4.310		
Effusions					
Pre	22	2.863	3.603	0.13	.449
Post	22	2.772	2.975		
A-Joints					
Pre	22	33.863	10.389	3.77	.000***
Post	22	25.818	10.813		
Pain					
Pre	21	14.190	5.297	-0.16	.438
Post	21	14.428	5.455		

* p < .05

*** p < .001

Previous analyses on the MHLIC, found no differences between the experimental and control groups on internal, chance, and powerful others pre-scores (Table 1), as well as no difference between groups on change scores as a result of treatment (Table 4). Additional analyses were performed on the differences between pre-scores on each MHLIC scale (Table 7A), and between post-scores on the same scales (Table 7B), for all subjects regardless of group (N=22), in order to determine how subjects diagnosed as having RA perceive control over their health and illness; i.e., on which MHLIC scale do they score highest or lowest. T-tests revealed significant differences between internal and chance pre-scores ($t=4.04$, $p<.001$) and between powerful others and chance pre-scores ($t=-4.23$, $p<.000$). Chance was the lower mean in each comparison indicating that the RA subjects do not believe that fate or chance but rather powerful others or themselves play a large part in determining their health or illness. Post-score t-tests remained statistically significant: internal versus chance ($t=2.21$, $p<.05$); powerful others versus chance ($t=-3.78$, $p<.001$).

Table 7A
T-Tests on
Pre-Scores of MHLIC Scales

Variables	N	Difference Mean	SD	t-value	2-tail Prob.
Internal P-Others	21	-.190	6.431	-.14	.893
Internal Chance	21	7.190	8.152	4.04	.001***
Chance P-Others	21	7.380	8.003	-4.23	.000***

Table 7B
T-Tests on
Post-Scores of MHLIC Scales

Variables	N	Difference Mean	SD	t-value	2-tail Prob.
Internal P-Others	21	-1.476	6.226	-1.09	.290
Internal Chance	21	4.428	9.174	2.21	.039*
Chance P-Others	21	-5.904	7.162	-3.78	.001***

* $p < .05$; *** $p < .001$

Finally, since medications remained fairly constant for each subject, but did vary considerably from subject to subject, no analyses were performed to assess changes over time and between groups.

Discussion

The initial analysis comparing the experimental group to the control group on pre-scores, using t-tests, revealed only one significant difference, which occurred on the powerful others locus of control. This finding indicated that subjects in the experimental group began the study with a significantly lower belief in the ability of powerful others to determine their health. Additional findings, however, which indicated that the experimental and control group did not change significantly pre to post nor did they differ significantly on post change scores, suggest the possibility that this finding was an example of a chance difference.

The primary hypothesis that relaxation and imagery would significantly alter medical measures of rheumatoid arthritis, tested by between group t-tests and discriminant analysis, was not supported. Neither analysis revealed differences between the experimental and control groups on medical measures. Moreover, on only one measure, extension, did the experimental group improve while the subjects in the control group worsened. Furthermore, on measures of walking-time and erythrocyte sedimentation rate, both groups showed a worsening of symptoms, while on the five remaining measures, right and left hand grip strength, flexion, number

of effusions, and number of active joints, the control group showed more improvement than the experimental group. Therefore, the non-existence of the hypothesized significant differences, strongly suggests that the use of relaxation and imagery with RA is not an effective treatment over a six week period. However, this lack of significant differences between the experimental and the control group could possibly have been due to the length of the treatment program. Although research (Rothermich, Philips, Waldemar, & Thomas, 1976) on treatment which affects the immune system; i.e., gold; has demonstrated treatment effects within five to eight weeks, it is possible that more time is required for relaxation and imagery to have a significant similar effect. A further consideration in determining the validity of the results is that, although an attempt was made to avoid the use of medical therapies such as gold and cortisone, it was necessary in some instances, for the well-being of the patient, for such treatments to be applied during involvement in the study.

The finding that the experimental and control groups did not differ significantly on the internal, chance, and powerful others scales of the MHLC, due to treatment, indicates that involvement in the relaxation and imagery program did not alter locus of control beliefs significantly. In retrospect, however, it is possible that unless subjects changed significantly on the medical measures, which was not the case in this study, then change

in locus of control was unlikely. Significant decreases in medical symptoms, regardless of which group the subject was in, could lead to feelings of increased control, assuming one attributes the change to the efforts of themselves or powerful others, and not to chance. This increase in feelings of control could then lead to increases on internal and powerful others scale scores. Similarly, a significant increase in medical symptoms is likely to lead to feelings of less control and hence, increases in chance scores. It is also possible that such a relationship between changes in symptoms and locus of control beliefs may not be peculiar to RA patients but could be found with other illnesses.

The hypothesis that relaxation and imagery would significantly reduce state anxiety as measured by the STAI, was not supported. One probable explanation could be that, although the RA subjects learned to relax, it is possible they respond to statements on the State-Anxiety Scale in terms of their illnesses; i.e., pain, discomfort, psychosocial problems, etc.; and not simply in terms of situational state anxiety. If this were the case, subject scores on the State-Anxiety Scale could not be expected to decrease significantly, since, for the most part, the medical condition of these subjects did not improve. However, if a subjects improvement on medical symptoms was significant, then state anxiety scores might also be expected to decrease significantly. Slightly suggestive of this relationship was that, of eleven subjects who showed a

decrease of more than eleven in active joint count, eight showed a decrease in State-Anxiety scores.

The hypothesis that relaxation and imagery would significantly reduce pain ratings, tested using between-group t-tests, was not supported. It is highly probable that any benefits gained from a psychological approach to pain with RA is simply not enough to compensate for the large physiological basis of pain associated with this disease.

The analysis looking at pre-post changes, irrespective of group, found significant improvement on only two of the medical measures, flexion and active joint count. Also, there was a significant decrease on internal locus of control and a significant increase on chance, indicating that, overall, subjects weakened in their belief in personal control over their illness and strengthened their belief in chance factors. Given the minimal improvement in terms of overall recovery from disease following 6 weeks of treatments, it may not be surprising that subjects decreased in their feelings of control.

The analysis conducted on pre-scores of the MHLC to examine how individuals with diagnosed RA perceive control over their health and illness revealed a highly significant difference between internal and chance, and between powerful others and chance pre-scores. This finding indicates that RA patients believe more strongly in themselves and powerful

others as playing a large part in determining their state of health, as opposed to chance factors. A possible explanation for this finding could revolve around the large amount of uncertainty and lack of control associated with this disease, such as unknown cause, a highly variable course with unpredictable exacerbations, and the possibility of future crippling. It is possible that RA patients must, in some way, attempt to regain control over this illness. This could be done by ascribing more importance to the role of both powerful others, such as doctors and 'quack-cures', and one's personal efforts, such as physiotherapy exercises, thereby possibly strengthening one's belief in their effectiveness.

Conclusion

The hypothesis that the use of relaxation and imagery with rheumatoid arthritis would significantly reduce medical symptoms was not supported by the present study. This result lends no support to the Simontons' suggestion that their procedures, developed for use with cancer patients, may also be effective with arthritis patients. In order to further test the hypothesis, it is suggested that future research lengthen the six-week treatment program and more tightly control for confounding medical therapy.

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CONSENT FORM

Lakehead University
Psychology Dept. in
cooperation with St.
Joseph's Hospital

For: A Study on Self-Responsibility For Health

I, the undersigned, understand that the research in which I am about to take part is concerned with self-responsibility for health in people diagnosed with rheumatoid arthritis, and is being conducted with the cooperation of Dr. Barry Koehler and Ms. Helen Boggett of St. Joseph's Hospital. I also understand that if, at anytime, I wish to discontinue my participation, I will be free to do so.

I further understand that all information collected in this research will be kept confidential, and that any published data from this research will not contain identifying information about individual participants.

In addition, I understand that the researcher will explain to me the purpose of the study and what possible benefits might arise from the results, upon completion of the study. Furthermore, I understand that I will be asked to take two 'blood tests' during this research.

I have read and understood all of the above information.

Signed: _____

Date: _____

Number _____

The following are eighteen statements having to do with people's feelings about health. Below each statement is a line on which you can mark how much you agree or disagree with the statement, by circling a point on the line. After reading each statement, will you circle the point on the line which you feel best represents your feelings of agreement and disagreement with the statement? There are no right or wrong answers, just opinions. Please try to answer as honestly as you can.

1. If I get sick, it is my own behaviour which determines how soon I get well again.

Strongly
Agree

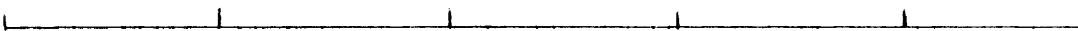
Strongly
Disagree



2. No matter what I do, if I am going to get sick, I will get sick.

Strongly
Agree

Strongly
Disagree



3. Having regular contact with my physician is the best way for me to avoid illness.

Strongly
Agree

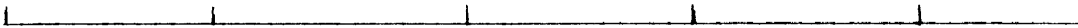
Strongly
Disagree



4. When I stay healthy, I'm just plain lucky.

Strongly
Agree

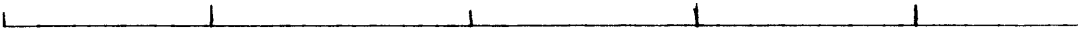
Strongly
Disagree



5. The main thing which affects my health is what I myself do.

Strongly
Agree

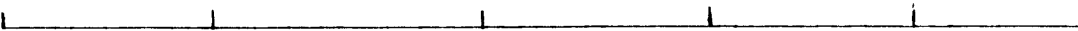
Strongly
Disagree



6. If I take care of myself, I can avoid illness.

Strongly
Agree

Strongly
Disagree



-2-

7. When I recover from an illness, it's usually because other people (for example, doctors, nurses, family, friends) have been taking good care of me.

Strongly
Agree

Strongly
Disagree



8. Even when I take care of myself, it's easy to get sick.

Strongly
Agree

Strongly
Disagree



9. When I become ill, it's a matter of fate.

Strongly
Agree

Strongly
Disagree



10. If I take the right actions, I can stay healthy.

Strongly
Agree

Strongly
Disagree



11. Regarding my health, I can only do what my doctor tells me to do.

Strongly
Agree

Strongly
Disagree



12. Most things that affect my health happen to me by accident.

Strongly
Agree

Strongly
Disagree



13. Whenever I don't feel well, I should consult a medically trained professional.

Strongly
Agree

Strongly
Disagree



-3-

14. I am in control of my own health.

Strongly
AgreeStrongly
Disagree

15. My family has a lot to do with my becoming sick or staying healthy.

Strongly
AgreeStrongly
Disagree

16. Whatever goes wrong with my health is my own fault.

Strongly
AgreeStrongly
Disagree

17. Luck plays a big part in determining how soon I will recover from illness.

Strongly
AgreeStrongly
Disagree

18. Health professionals control my health.

Strongly
AgreeStrongly
Disagree

Number _____

There are just a few more questions I would like to ask you.

1. You can see that one end of the line represents the healthiest you could possibly be, while the other end represents the sickest you could be. Can you circle the point that shows how well or sick you feel yourself to be right now?

The healthiest
I could be

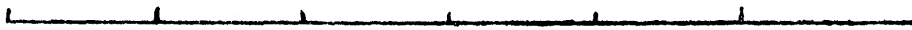
The sickest
I could be



2. During our lives the importance of being healthy varies. The following line represents the importance of your health to you over the past few years. Please circle the point on the line which best shows the importance of your health to you in the recent past.

Least
Important

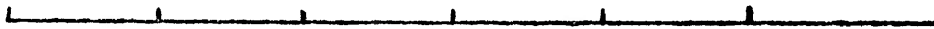
Most
Important



3. Hospitalization and/or participation in an intensive treatment program can have an effect on the way we see many things. How important to you is your health now after being admitted to the hospital and/or intensive treatment program?

Least
Important

Most
Important



PREVIOUSLY COPYRIGHTED MATERIAL
IN APPENDIX D, LEAVES 68-69,
NOT MICROFILMED.

Self-Evaluation Questionnaire
Developed by C.D. Spielberger, R.L. Gorsuch,
and R. Lushene.

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SELF-EVALUATION QUESTIONNAIRE

Developed by C. D. Spielberger, R. L. Gorsuch and R. Lushene

STAI FORM X-1

NAME _____ DATE _____

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then blacken in the appropriate circle to the right of the statement to indicate how you *feel* right now, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1. I feel calm	①	②	③	④
2. I feel secure	①	②	③	④
3. I am tense	①	②	③	④
4. I am regretful	①	②	③	④
5. I feel at ease	①	②	③	④
6. I feel upset	①	②	③	④
7. I am presently worrying over possible misfortunes	①	②	③	④
8. I feel rested	①	②	③	④
9. I feel anxious	①	②	③	④
10. I feel comfortable	①	②	③	④
11. I feel self-confident	①	②	③	④
12. I feel nervous	①	②	③	④
13. I am jittery	①	②	③	④
14. I feel "high strung"	①	②	③	④
15. I am relaxed	①	②	③	④
16. I feel content	①	②	③	④
17. I am worried	①	②	③	④
18. I feel over-excited and "rattled"	①	②	③	④
19. I feel joyful	①	②	③	④
20. I feel pleasant	①	②	③	④



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SELF-EVALUATION QUESTIONNAIRE

STAI FORM X-2

NAME _____ DATE _____

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then blacken in the appropriate circle to the right of the statement to indicate how you *generally* feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

	ALMOST NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS
21. I feel pleasant	①	②	③	④
22. I tire quickly	①	②	③	④
23. I feel like crying	①	②	③	④
24. I wish I could be as happy as others seem to be	①	②	③	④
25. I am losing out on things because I can't make up my mind soon enough	①	②	③	④
26. I feel rested	①	②	③	④
27. I am "calm, cool, and collected"	①	②	③	④
28. I feel that difficulties are piling up so that I cannot overcome them	①	②	③	④
29. I worry too much over something that really doesn't matter	①	②	③	④
30. I am happy	①	②	③	④
31. I am inclined to take things hard	①	②	③	④
32. I lack self-confidence	①	②	③	④
33. I feel secure	①	②	③	④
34. I try to avoid facing a crisis or difficulty	①	②	③	④
35. I feel blue	①	②	③	④
36. I am content	①	②	③	④
37. Some unimportant thought runs through my mind and bothers me	①	②	③	④
38. I take disappointments so keenly that I can't put them out of my mind	①	②	③	④
39. I am a steady person	①	②	③	④
40. I get in a state of tension or turmoil as I think over my recent concerns and interests	①	②	③	④

Appendix E

Relaxation and Imagery Program

You have been asked to participate in a study that will be looking at the effects of relaxation and imagery on your rheumatoid arthritis and the pain associated with it. I am interested in seeing if the use of relaxation and imagery on those with rheumatoid arthritis will result in a lessening of such symptoms as swelling, stiffness or pain.

Exactly how this might happen is unknown: 1) it may be that relaxation which reduces muscle tension due to stress thereby prevents arthritic attacks since, at times, muscle tension precedes attacks of arthritis; 2) it may be that relaxation increases the blood flow to different parts of the body; or 3) perhaps, since learning to relax aids the immune system, according to findings, and since there is evidence to suggest that a dysfunctioning immune system may play a role in causing arthritis, then perhaps relaxation can have an effect on your arthritis in this manner; or 4) it may be that rebalancing of the endocrine system which can result from relaxation and imagery will be the key since a dysfunctioning endocrine system has also been cited as playing a role in arthritis; or finally, 5) it may be that learning to relax gives the body more energy to combat the arthritis and especially the pain associated with it.

The point is, that relaxation and imagery has a large number of physiological effects on the body which may be very beneficial in fighting your arthritis.

Now you will be asked to concentrate on sensations of heaviness and warmth in the limbs, and on improving the regularity of the heart beat and breathing. You will also be asked to visualize, or picture in your mind, several images: 1) one will be a peaceful scene by a river bank; 2) another will be your arthritis in whatever way you wish to picture it, we can discuss that now; and 3) another will be your medication and white blood cells attacking your arthritis, let's discuss that now.

Are there any questions up to this point?

We will now begin the relaxation and imagery, and after we are through we will talk about how you feel and several other points.

The following Relaxation and Imagery protocol was recorded on cassette tapes for home practice.

Relaxation and Imagery Protocol

This process of relaxation and mental imagery is most effective if done on a regular basis. I suggest 2 times daily, after lunch, and at night before going to bed. I suggest you do it one time with the tape, one time without, until you get to the point where you no longer need the tape.

Now, preferably lying down, get comfortable in this position loosening any tight clothing, and remaining as still as you can, shifting occasionally to make yourself comfortable.

The first step in relaxation is to allow your breathing to become slow, regular and easy. Close your eyes now and take a deep, slow breath through your mouth. Hold that breath for several seconds and exhale. Take another deep, slow breath, hold that breath while counting to 4, now breathe out and let go completely. As you continue to tune in to your breathing, allowing it to become slow regular and easy, allow your face to remain calm and smooth without bumps, not squinting as you take each deep breath. Take another deep breath now, hold it, exhale, and as you blow the air from your body, allow feelings of tension to leave with the exhaled air. One effective way to begin to turn loose of the tension is to open your mouth very wide, as if yawning; begin that now, hold your mouth open for several

seconds so you can feel the tension, and now allow your mouth to relax and as you do this you may find that your mouth remains open a small amount. You may now begin to feel a wave of relaxation spreading over your entire body.

Continuing to concentrate on slow, deep breathing, I want you to slowly repeat mentally to yourself, as you hear them, without speaking, each of the following phrases I say to you.

I feel very calm and quiet. I feel very comfortable and quiet. I am beginning to feel quite relaxed. I am beginning to feel quite relaxed.

I feel very calm and quiet. I feel very comfortable and quiet. I am beginning to feel quite relaxed. I am beginning to feel quite relaxed.

Continuing to allow your breathing to become slow, regular and deep, and remaining calm and quiet, I want you to turn your attention to the parts of your body, and, as before, repeat the following phrases to yourself as I say them. Beginning with your feet:

My feet feel heavy and relaxed. My ankles feel heavy and relaxed. My knees feel heavy and relaxed. My hips feel heavy and relaxed. My feet, my ankles, my knees, my hips, all feel heavy and relaxed. My stomach and the whole central portion of my body feel heavy and relaxed. My breathing is slow and regular. My stomach and the whole

central portion of my body feel heavy and relaxed. It would be only with great difficulty that I could raise them at this moment. They feel so heavy, so very, very heavy. My arms feel heavy and relaxed. My shoulders feel heavy and relaxed. My neck feels heavy and relaxed. My jaws feel heavy and relaxed. My forehead feels heavy and relaxed. My neck, my jaws, my forehead, all feel very heavy and very relaxed. My entire body feels heavy and relaxed. My whole body feels heavy and relaxed. My breathing is getting deeper and deeper. My breathing is getting deeper and deeper.

Now I can imagine and feel the warm sun shining down on me, warming the top of my head. The top of my head feels warm and heavy. Now the relaxing warmth flows down from my head into my right shoulder. My right shoulder feels warm and heavy.

My breathing is getting deeper and deeper.

Now I sense the relaxing warmth is flowing down from my head and into my right shoulder and the relaxing warmth is flowing gently, settling down to my right hand. My right hand feels warm and heavy (10 second pause).

My right hand feels warm and heavy. My right hand is drawing the flow of heat, down from my head, hand is warming, head is cooling. My right hand feels warm and heavy (10 second pause).

Now the relaxing warmth flows back up to my right arm. My right arm feels warm and heavy. The relaxing warmth spreads up through my right elbow, and into my right shoulder. My right elbow, my right shoulder, feel warm and heavy (10 second pause).

Now the relaxing warmth goes slowly throughout my whole back. I feel the warmth relaxing my back. My back feels warm and heavy. The relaxing warmth flows up my back and into my neck. My neck feels warm and heavy (10 second pause). The relaxing warmth now flows from my neck into my left shoulder. My left shoulder feels warm and heavy (10 second pause).

My breathing is getting deeper, and deeper, and deeper.

The relaxing warmth flows down to my left hand. My left hand feels warm and heavy (10 second pause). My left hand feels warm and heavy. The relaxing warmth goes back up to my left arm. My left arm feels warm and heavy. The relaxing warmth spreads up my left elbow and into my left shoulder. My left elbow, my left shoulder, feel warm and heavy.

The relaxing warmth now flows to my heart. My heart feels warm and easy (10 second pause). My heart feels warm and easy. My heart beat is becoming slow and regular (10 second pause). My heart beat is slow and regular.

Now the relaxing warmth flows down into my stomach. My stomach feels warm and quiet. My breathing is deeper and deeper. My breathing is deeper and deeper (10 second pause).

Now the relaxing warmth flows down into my right thigh. My right thigh feels warm and heavy. The relaxing warmth now flows down into my right foot. My right foot feels warm and heavy (10 second pause).

Now the relaxing warmth flows slowly up through my right calf, to my right knee, to my right thigh. My entire right leg feels warm and heavy. My breathing is deeper and deeper (10 second pause).

Now the relaxing warmth flows down into my left thigh. My left thigh feels warm and heavy. Now the relaxing warmth flows down into my left foot. My left foot feels warm and heavy (10 second pause). All of the warmth from my head is flowing down through my body into my left leg. My left leg feels warm and heavy (10 second pause).

The relaxing warmth now slowly flows up through my left calf, to my left knee, to my left thigh. My left leg feels warm and heavy. My breathing is deeper and deeper (10 second pause). My breathing is deeper and deeper.

The relaxing warmth now flows up through my abdomen, through my stomach and into my heart. My heart feels warm and easy. My heart pumps relaxing warmth throughout my

entire body taking warmth from my head and letting it flow down to my calm and heavy body.

My whole body is heavy and warm and relaxed, drawing heat from my head. My whole body is heavy, warm and relaxed, drawing heat from my head.

I am breathing deeper and deeper. I am breathing deeper and deeper. My whole body feels very quiet and very serene.

My whole body feels very comfortable and very relaxed and very quiet, and very heavy and very serene (10 second pause).

My whole body feels very comfortable, and very relaxed and very heavy.

Picture yourself in a nice, pleasant scene from nature. I usually picture myself on a creek bank under a large oak tree, lying there comfortably, and I allow myself to listen to the water as it trickles past. And as I do this it allows me to become more relaxed and become more mentally alert at the same time (15 second pause).

The purpose of this relaxation and imagery is to help improve health, focusing specifically on your arthritis. Force yourself now to mentally picture your arthritis in a

way that makes sense to you. Think of your arthritis as weak and powerless and only becoming painful when our body is weakened due to overtiring and stress. Picture your arthritis now in the manner in which you have been instructed...

...If you are taking medication picture the drug coming into the body and entering the bloodstream. Picture the drug acting like a poison. Your normal healthy tissue and bone is very strong and is not harmed by the drug, but the arthritis--in the form you are picturing it--is very weak so it takes very little poison to dissolve it away. Picture your body's own white blood cells coming into the area where the arthritis is and upon recognizing the arthritis the white blood cells destroy it. There is a vast army of white blood cells. They are very strong and aggressive. They are also very smart and defeat the arthritis without damaging other body tissue. See the remains of this battle being flushed from your body through the liver and kidney and eliminated from the body in waste.

Force yourself to see yourself getting better. This may be extremely difficult to do at first but as you force yourself to see yourself getting better it will become easier. Picture yourself as having more energy and a better appetite doing things which your arthritis prevents you from doing. See yourself doing these things very clearly because these are the primary reasons for gaining your health,

whether these things be work related or going ice curling at the arena.

Now if you are experiencing any pain in your body, in any part of your joints, focus your mind on the pain; see your body's resources, the white blood cells, flowing into the area. Give your body the command to repair what is wrong. Give your body the command to heal itself. See your body becoming more normal, see your body becoming well. Become aware of the tension that pain creates and remember that your body has the ability to heal itself and hold this thought in your mind. Imagine the pain going away and feel that part of your body become more relaxed, calm, and quiet, that part of your body feeling more comfortable.

Now appreciate that what you are doing is all a mental exercise, developing mental abilities to help yourself gain better health. And just as you are developing any skill practice is important. See yourself doing this on a regular basis, say after lunch and before going to bed, doing it regularly so that it becomes a part of you, and everytime you are through pat yourself on the back for having taken this time to relax. Always pleased with yourself for having taken this time to relax and becoming more in tune with yourself so that you can participate in your health more actively.

Now, without opening your eyes yet, let yourself become bright and alert, begin to move your arms, legs and head. Become more aware of the room and any sounds around you.

Now let your eyes open and in a few moments you are ready to resume your usual activities.

This ends the Tape Recorded Protocol

This relaxation and imagery seems so simple that it at first seems improbable that results could come from such a simple procedure, but healing is not only something done to us. As you well know you must look after your diet and also exercise. This relaxation program is another way of participating in your own health, something else you can do to help yourself. This relaxation program is not a substitute for medical treatment, for it important to pursue both. What this program is, however, is a way of giving you a larger role in aiding the body's own healing abilities. But the value of this program comes from actually doing the activities. You need a quiet place, passive attitude, and a comfortable position, without going to sleep.

This relaxation and imagery and the feelings associated with it is very natural but it can only improve if time is set aside and a conscious effort is made. The more you practice the easier it will become.

Pain Scale 0 - No pain
 1 - Slight
 2 - Moderate
 3 - Severe
 4 - Agonizing

	Pain Rating	Medication		Pain Rating	Medication
Week 1	1		Week 4		
	2				
	3				
	4				
	5				
	6				
	7				
Week 2	Pain Rating	Medication	Week 5	Pain Rating	Medication
	1				
	2				
	3				
	4				
	5				
	6				
Week 3	Pain Rating	Medication	Week 6	Pain Rating	Medication
	1				
	2				
	3				
	4				
	5				
	6				

Appendix G

Control Subject Protocol

You have been asked to participate in a study involving self-responsibility for health. What you and I will be doing in the coming weeks, once per week, six weeks in all, is reviewing your intake of analgesics and also your self ratings of pain. We will discuss any changes in your pain ratings and amount of analgesics in an attempt to get at some of the reasons for the changes. We will be doing this, not so that I can suggest changes in your medication, for I will not be doing this, but to assess as closely as possible the relationship between these readings and recordings, and how you have responded on the questionnaires.

Appendix H

Missing Data

Control Subjects

Subjects: 1a) Post Erythrocyte Sedimentation Rate

b) Pre-Post Walking Time

c) Pre-Post Pain Rating

2a) Post Erythrocyte Sedimentation Rate

3a) Pre-Walking Time

4a) MHLIC Questionnaire

b) Pre-Post Extension

c) Pre-Post Flexion

Experimental Subjects

Subjects: 1a) Pre-Post Extension

b) Pre-Post Flexion

2a) Pre-Walking Time