THE UNIVERSITY OF ALBERTA

GROUP PSYCHOTHERAPY WITH RHEUMATOID ARTHRITICS

by

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A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF EDUCATION

DEPARTMENT OF EDUCATIONAL PSYCHOLOGY

EDMONTON, ALBERTA

FALL, 1972

ABSTRACT

The purpose of this study was to explore the possibility of effecting change in the behavior of the rheumatoid arthritic individual through the use of group psychotherapy.

The assumption was made, based on the literature review, that there is a 'rheumatoid personality', reactive to stress, which combined with a genetic predisposition leads to the rheumatoid arthritic disease state.

This study has concerned itself mainly with that aspect of the rheumatoid arthritic personality that inhibits hostility, aggression, and sexual drive; and an attempt has been made, using group psychotherapy, to teach alternate ways of dealing with repressed emotions, hoping thereby to reduce muscle tension, and improve the disease state of the individual.

The study, spread over eleven weeks, was divided into pre-treatment, treatment, and post-treatment periods. The 20 rheumatoid arthritic subjects participating were randomly selected into control, placebo, and treatment groups. Mortality rate from this study was one female subject from the treatment group. All 19 remaining subjects were measured on the following instruments: Dogmatism Scale, Rigidity Scale (pre- and post-tests); sed. rate, right and left hand grip strength, and subjective evaluation (biweekly

intervals for six sessions), right and left muscle tension (once per each time period), and aspirin intake.

During the treatment period the three groups varied activity-wise. The control group had no additional experience other than the biweekly testing sessions. The placebo group spent approximately 30 hours together in addition to the biweekly testing sessions, and was exposed to activities within a social context, but no identifiable type of psychotherapy. The treatment group also spent 30 hours together in addition to the biweekly testing sessions, and were exposed to group psychotherapy that focused on interpersonal and intrapersonal communication skills.

In order to assess the effect of the treatment on the change of behavior, the mean scores for the treatment, placebo, and control groups on all criteria were analyzed via a one-way analysis of covariance. A series of one-way analyses of covariance were conducted, using both the pretreatment time period and the independent variables selected by Pearson Product-moment correlations, as covariates. The level of significance was set at 0.05 for all tests.

The results of this study showed no significant differences due to treatment; the possibility exists, however, that there may in fact be a difference due to treatment which has not been detected due to the restricted sample size. An important observation is that the ordering of the adjusted means is in line with the underlying hypothesis of

this study. Both the treatment and the placebo groups varied in a positive direction from the control group on seven of the nine measures. However, the placebo group scored either lower or approximately the same as the treatment group.

Thus, while it is not possible to conclude from this study that group psychotherapy is beneficial, or that the placebo effect produces as much change as group therapy, the study does provide useful information for someone willing to pursue this basic hypothesis with a larger sample and more powerful analysis.

ACKNOWLEDGMENTS

I wish to extend my warm and grateful thanks to all who have contributed in so many ways to my study, and especially the following:

First, Dr. E.G. Kidd, your understanding, support, and assistance has helped change my dream into reality in relation to this particular study.

Secondly, Dr. Al Vanderwell, as my thesis supervisor, with your warmth and 'skillful frustration' you have added not only to my own personal growth, but have made the painful process of thesis toil more bearable.

Dr. Ralph Hakstein, thesis committee member, you have contributed considerably to the excellence of this study, and my learning from you may possibly be 'statistically significant'.

To you, Dr. Lorraine Wilgosh, as my third committee member you gave me much needed encouragement and warmth which I treasure.

Thank you Dr. David Bell for giving so generously of your time and interest in serving on my thesis committee.

My sincere thanks and appreciation to all of the staff at Student Counselling who have made available many resources for this study in addition to giving me much support and encouragement.

Thanks, Sharon Hobson, for the tremendous assistance you gave me in the picky practical aspects of this study in addition to your time and energy spent as a group hostess along with Diane Somosh.

To Paul Peel and Joe Couture I wish to thank you both for your enthusiasm, skill, and involvement in this study as group leaders.

Warm thanks to my two typists, Eva Van Loon and my eldest daughter, Valerie, for the many midnight hours struggling against what seemed at times to be overwelming odds.

I appreciate the concern of all of my colleagues (particularly Donna Cookson, Helma Voth, and Murray Richmond) who have empathized and nurtured my soul as I attempted to make my way through the thesis 'jungle'.

Without the understanding and most-times cooperation of my children, Valerie, Keith, William, Susan, Jamie, and Katie, my survival would have been much more stressful.

And last, as Virginia Satir might say, I give myself a small vote of appreciation for having the courage, perserverance, and some gall to embark upon this particular study.

TABLE OF CONTENTS

LIST OF TABLES

The sorrow which has not vent in tears
may make other organs weep

Edward Maudsley

It is more important
to know the person that has the disease,
than to know
the disease the person has.

Hippocrates

CHAPTER I

INTRODUCTION

In recent years there has been a growing realization that rheumatic diseases, conditions in which pain and stiffness of some portion of the musculoskeletal system are prominent, form a trememdous segment of chronic disability all over the world. There is little doubt that rheumatic diseases are a major health problem. A total of nearly 11 million persons in the United States alone are suffering from some form of rheumatic disease. (Hollander, 1966)

Rheumatoid arthritis, with which this study is concerned, is one of the most common of the more severe forms of rheumatic disease. The greatest incidence of occurrence of rheumatoid arthritis is found between the ages of 20 and 50, affecting three women for each man. Although rheumatoid arthritis seldom causes death directly, it is the greatest cause of crippling deformity from any disease. Walkie, Marmon, & Upshaw (1967) state the following:

> Recognized as early as the fourteenth century B.C., rheumatoid arthritis remains a disease for which neither cause nor cure has yet to be definitely identified; one in which physical and psychologic factors are almost inextricably interrelated (p. 1420).

Much research has taken place over the years as to the aetiology of rheumatoid arthritis and many theories have been prominent at one time or another. Robinson (1966) states:

> Intensive efforts have failed to establish that it is caused by a specific infectious agent, by nutritional excess or deficiency, by metabolic aberration, by faulty or unbalanced endocrine secretions, or by a well defined mechanism involving dysfunction of the autonomic nervous system or the somatic reflection of emotional or personality disorders. Impressive evidence is accumulating to suggest the importance of a hypersensitivity mechanism in the pathogenesis of the disease, although the initiating events still remain obscure (p. 18).

This last mentioned mechanism is more commonly known as the auto-immune theory, where the body's natural defense forces destroy the very tissues they are meant to protect.

In the literature during the past several years there seems to be some movement away from the position which regards rheumatoid arthritis as caused by a single factor, towards a multifactorial consideration of aetiology. (Cobb, 1965; Geist, 1966; Groen & Welner, 1966; Moos & Solomon, 1965; Ramon, 1969)

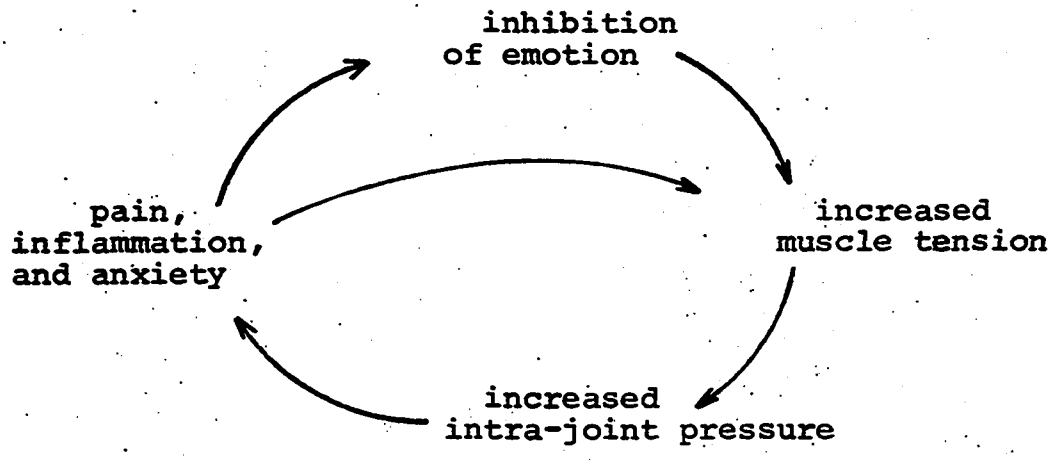
From the literature, the following factors seemed to be particularly relevant: a genetic or constitutional predisposition as expressed in some individuals by the presence of a rheumatoid blood factor; a type of personality that represses emotion (particularly hositility and aggression), plus a low self-esteem; and environmental stress. If these factors occur in one individual at a point in time, this individual might be a likely candidate to develop rheumatoid arthritis.

The question is then posed as to whether altering one or more of these factors would result in an improvement in the health of the individual already suffering from rheumatoid arthritis. Since it is at present impossible to alter the genetic predisposition of the rheumatoid arthritic individual, and often not feasible to change the environmental stress, it seems logical that by helping the individual to learn new ways of adapting to stress, that a remission of the disease process might occur.

The Problem

For the purpose of this investigation the assumption was made, based on the literature review, that there is a 'rheumatoid personality', reactive to stress, which, combined with a genetic predisposition, leads to the rheumatoid arthritic disease state.

A common dimension of the 'rheumatoid personality' seems to be one of chronically inhibiting emotions, particularly those of hostility, aggression, and sexual drive. Emotional repression produces increased muscle tension, leading to increased pressure within the joints with ensuing pain, inflammation, and anxiety, which results in a further increase in muscle tension. The following is a schema of this possible psycho-physical dynamic relationship.



Thus the rheumatoid arthritic individual reflects psychological tensions and conflicts through increased tension of the somatic muscular system. Wilhelm Reich (1949), a psychoanalytic pioneer in the area of the mind-body relationship, contributed the concept of muscular armouring of the individual, wherein the total expression of the armoured individual is that of "holding back". Reich states,

> If the armouring is of long standing and has also influenced the tissues of the organism, the patient will come to us with peptic ulcer, rheumatism, arthritis, cancer or angina pectoris (p. 366).

In addition to this circular psycho-physical relationship, the psychological-stress state may occur to the point where the usual defense mechanisms of the individual are no longer adequate, and the rheumatoid arthritic disease state may occur.

By helping the individual to learn alternate ways of dealing with emotions, e.g. learning to express emotions

overtly rather than keeping them covert, a decrease in muscle tension may result, tending to reverse the disease process.

The few studies found in the literature pertaining to the use of psychotherapy suggest that psychotherapy can be valuable as a means of reducing muscle tension. (Draspa, 1959; Gottshalk, Serota, & Shapiro, 1950; Shochet, Lisansky, Schubart, Fiocco, Kurland, & Pope, 1969)

The purpose of this study was not to assess the personality dimension of the rheumatoid arthritic per se, but rather to explore the possibility of promoting change in the behavior of the rheumatoid arthritic individual through the use of group psychotherapy.

Definitions of Terms

Rheumatoid arthritis. Dixon (1965) states that rheumatoid arthritis is:

> an illness characterized by a chronic non-suppurative polysynovitis particularly involving joints in the hands and feet and often in a symmetric pattern, with a variable course of exacerbations and remissions, and often accompanied by some systemic illness, e.g. anaemia, weight loss, visceral lesions and changes in serum proteins (p.14).

Stress. Hans Selye (1956) describes stress as the "rate of wear and tear in the body" caused by life at any one time; or the bodily changes produced whether a person is

exposed to nervous tension, physical injury, infection, cold, heat, x-rays, or anything else.

Selye advanced the theory that man is faced with two types of stress, specific and non-specific. If a non-specific stress is encountered repeatedly, there is an alarm reaction following this pattern:

1. Shock acting as a depressant of the nervous system.
2. Counter shock or the stage of resistance in which the body increases production in the pituitary and adrenal glands of the adaptive hormones (anti-inflammatory and pro-inflammatory).
3. A state of exhaustion which develops when further resistance cannot be maintained.

Thus resistance and adaptation depend upon a proper balance between the endocrine and nervous systems. Derailment of this mechanism that Selye calls the General Adaptation Syndrome produces diseases of adaptation such as rheumatoid arthritis. This disease state then is the consequence of the body's inability to provide adequate adaptive reactions.

Selye's work assumes importance in this study because of consideration of stress as part of the multifactorial aetiology of rheumatoid arthritis.

Certainly the emotional state of the rheumatoid arthritic and the way he deals with his emotions would be in keeping with Selye's definition of stress with the accom-

panying hormonal and nervous system changes that occur. This concurs with the observation of Moos (1964) in a critical review of many personality studies that "all investigators of the personality of rheumatoid arthritics agree that emotional factors do play a role in either the onset or the course of the disease."

Rheumatoid Factor. This is an antibody possessing characteristics of an autoantibody that is found in the serum of approximately 70% of rheumatoid arthritics. However, rheumatoid factor is not specific for rheumatoid arthritis, but has been discovered in the elderly and in patients with other diseases such as cancer, cirrhosis, etc. (Hollingsworth, 1968)

There is some speculation that the rheumatoid factor causes the body to alter its state of immunity or autoimmunity. (Geist, 1966)

CHAPTER II

REVIEW OF RELATED LITERATURE

A review of the literature centering around personality variables of rheumatoid arthritics shows that for many years a relatively small group of investigators have searched for specific personality variables through the use of systematic clinical interviews and a variety of psychological and psycho-physiological tests, using various kinds of control populations for comparison. The studies indicate that there are some communalities and also some differences. The conflicting results across studies may be partly attributed to differences in choice of samples, comparison groups, techniques of eliciting psychological data, and in the terminology used to describe and discuss findings.

In support of the contention that the rheumatoid arthritic personality is characterized by repressed emotion, the following studies are cited.

Meyerowitz (1971) has grouped reported studies to date into three categories corresponding to the following hypotheses about the possible role of psychosocial variables in rheumatoid arthritis.

Specificity Hypothesis

This category is defined by Meyerowitz (1971) as follows:

> Individuals who become sick with rheumatoid arthritis can be characterized by identifiable psychological traits assumed to have been present prior to the onset of the manifest illness (p. 94).

Beginning in the 1930's, Alexander, French, & Pollock (1968) set out to examine the aetiological role of psychological factors in rheumatoid arthritis as one of a number of diseases considered to be psychosomatic. They postulated that two categories of variables are present prior to disease onset, one psychological and one organic, and that both of these are specific for rheumatoid arthritis. They felt that the postulated somatic predisposition and the accompanying psychological phenomena may mutually influence each other.

Dunbar (1954) reviewed the literature on psychosomatic interrelationships and collected data on more than 1,600 patients to identify a personality profile for what she considered eight illness states in which psychosomatic relationships could be established. On the basis of these observations Dunbar formulated the personality specificity theory of disease. One of the illness states described by Dunbar was rheumatoid arthritis. She identified rheumatoid arthritic patients as quiet, sensitive individuals who combined posing as a good sport with an ingratiating appeal for sympathy, beneath which much hostility was present. These patients had many neurotic traits which were viewed as defenses against guilt and depression related to sexual

conflicts. Trends towards perfectionism, cleanliness, orderliness, and punctuality were also noted.

Johnson, Shapiro, & Alexander (1947) conducted a psychoanalytically oriented investigation of mainly women patients. They describe these patients as having a conflict around the expression of aggressive impulses: direct expression of these produce guilt, while their inhibition leads to resentment, perhaps increased by increased muscle tone. They postulated that such patients maintain equilibrium through the expression of aggression in the form of increased physical activity, including the specific need to serve others, thereby controlling and dominating them.

Fisher and Cleveland (1968), using projective techniques and interviewing, compared male arthritic patients with patients suffering from other illnesses such as low back pain and duodenal ulcer. The findings for arthritie subjects suggested overt calmness and a lack of freedom to express anger, and prominent activity including an unusual amount of participation in vigorous athletics. Fisher and Cleveland were able to define a tendency towards experiencing the body image in a unique way: with a prominent psychic representation of the exterior or surface of the body as a hard shell. They speculated that the rheumatoid arthritic individual is a person who has unacceptable impulses over which he is so fearful of losing control that he has

found it necessary to convert his body into a containing vessel with a wall to prevent the outbreak of these impulses.

Moos, Solomon, & Lieberman (1965) reviewed relevant studies on the relationship between personality factors and the onset and cause of rheumatoid arthritis. In sum, their findings indicated that there seemed to be particular personality characteristics which were associated with rheumatoid arthritics, e.g. rheumatoid arthritic patients appeared to be more compliant, subservient, conservative, sensitive to anger, perfectionistic and self-sacrificing. They appeared to react to their disease with initial fear and depression. They attempted to cope with these feelings, however, by struggling for independence, keeping on the move, not expressing anger, being compliant, and being stoic and optimistic about their feelings. Moos and Solomon were careful to note that there appeared to be a great deal of individual variability in the personality patterns of patients with rheumatoid arthritis.

Geist (1966) cited a study by Weiss (1947) who, in working with five women and 35 men with various muscular complaints including rheumatoid arthritis, found that a special feature associated with muscular aches was chronic resentment. He postulated that these patients are "burned up"

with resentment, and "aching" to express their unappeased hostility.

A recent critical review of the literature by Wolff (1972) described the use of the Minnesota Multiphasic Personality Inventory (MMPI) as an investigatory tool for rheumatoid personality variables. He found that the MMPI has been used by many investigators, and that the results of these studies were largely consistent. The rheumatoid arthritic patient typically obtained elevated scores on three clinical MMPI scales (Hypochondriasis, Depression and Hysteria) with an occasional secondary elevation on a fourth scale, psychasthenia, Wolff notes that

> this pattern of scores represents the 'classical' MMPI profile for neurotic individuals and does not support the existence of a specific 'rheumatoid personality' pattern (p. 658).

The investigator of this study would like to note however, that the MMPI may be a valid measuring instrument of dimensions of rheumatoid personality since the scales of Hypochondriasis, Depression, and Hysteria tend to measure anxiety as expressed in physical symptoms, while the Psychasthenia scale is characterized by obsessive acts and thoughts.

Wolff also described the use of Cattell's 16 Personality Factors Questionnaire (16PF) given to rheumatoid arthritic patients by Robinson, Kirk, & Frye (in press), who used four diagnostic groups including rheumatoid arthritis,

diabetes, tuberculosis, and hypertension. These groups were each subdivided into "new" (diagnosed less than ten months previously) and "old" (diagnosed more than three years before) sets. The findings were that the rheumatoid arthritic "old" subgroup showed less emotional stability, low ego strength, greater depression, and greater guilt proneness and control compared to the other groups. In addition, unlike the non-arthritic groups, the "new" and the "old" rheumatoid arthritic patients displayed similar personality traits. Robinson et al concluded that either there exists a premorbid rheumatoid personality "type" which plays some role in the onset and progression of the disease, or that pain and crippling associated with rheumatoid arthritis modifies behavior to yield a common personality "type" regardless of the patient's premorbid personality make-up. Wolff noted that while the study deserves praise for its experimental design, the relatively small number of patients within each diagnostic group makes generalization rather tenuous.

A review done by Moos (1964) summarized studies of personality data on over 500 patients with the conclusion that several investigators agreed that rheumatoid arthritics, when compared to various control groups, tended to be self-sacrificing, masochistic, conforming, self-conscious, shy, inhibited, perfectionistic, and interested in sports and

games. They also tended to over-react to their illness. There were, however, disagreements about many other factors, e.g., the extent of the expression of anger, the importance of separation trauma, and the amount of impulsiveness and defiance shown. Moos emphasized that all of the reviewed investigators of personality agreed that emotional factors did play a role in either the onset or the course of the disease.

In summary, the 'specificity hypothesis' focuses on the presence before illness of an identifiable 'rheumatoid personality'. Studies herein indicated that some of the particular personality characteristics associated with rheumatoid arthritics are as follows: rheumatoid arthritic individuals tend to be self-sacrificing, conforming, inhibited, perfectionistic, vigorously active in sports and games, denying of feelings of hostility and aggression, and low in ego strength. However, there does appear to be a great deal of individual variability in the personality patterns of rheumatoid arthritics.

Disease Onset Hypothesis

Meyerowitz (1971) defines this second category of studies dealing with the possible role of psychosocial variables in rheumatoid arthritis as follows:

> a significant association between certain kinds of life experiences and/or psychological states and the onset of rheumatoid arthritis (p. 94).

In the literature there seem to be fewer studies which have investigated this hypothetical relationship of the onset of rheumatoid arthritis to stress.

Meyerowitz (1971) reports that the study of the Empire Rheumatism Council tends to disprove this hypothesis. For 532 patients with rheumatoid arthritis of less than five years' duration and an equal number of controls, check sheets were completed for a long list of factors implicated as possibly aetiologically significant. Standardized questions were asked concerning the occurrence of assumed stressful life events such as 'death, accident, or serious illness in the family, economic embarassment, broken engagement or unhappy married life'. There was no difference between patients and controls in reporting such events for a two-year period and a three-month period antedating disease onset. Meyerowitz concluded that

> such results challenge but do not disprove that psychological variables may be significant in the timing of onset of the illness, since the same external event may or may not be experienced as psychological stress (or as markedly different degree of stress) by different individuals (p. 99).

In a study by Moos & Solomon (1965) in which they made psychological comparisons between women with rheumatoid arthritis and their non-arthritic sisters, analysis of the interviews showed clear and striking differences between

patients and siblings in self-descriptions; in the extent of their masochism, self-sacrifice and denial of hostility; in the amount of rejection they perceived from their mothers; and in the degree of strictness they perceived from their fathers. No differences were found between the two groups either in the extent of their physical activity or in the extent to which they manifested dependency. Moos and Solomon postulated that a particular personality constellation may combine with either acute or chronic stress as one aetiologic factor in the development of rheumatoid arthritis.

The conclusions of Kirchman (1965), in a study using 25 rheumatoid arthritic patients and 25 non-arthritic physically disabled patients, tested by means of an interview and the IPAT Sixteen Personality Factor Questionnaire, appeared to support the hypothesis that there is a relationship between environmental stress and the onset or exacerbation of rheumatoid arthritis. She postulated that hostile feelings are so unacceptable to rheumatoid arthritics that they are veiled by conscious responses of submissiveness and dependence.

Geist (1966) conducted a study using 22 rheumatoid arthritic patients and 22 non-arthritic patients who were assessed by using an interview questionnaire, the MMPI, the Holtzman, and the group Rorschach. He found that two universal psychological elements of the rheumatoid arthritic

patients in this study were unexpressed rage and lack of ego strength. He postulated that,

> if it is assumed that both ego strength and the rheumatoid factor are congenital and in a given person there is initially the presence of the rheumatoid factor and a weak 'ego', then the soil is fertile for the development of rheumatoid arthritis. Because of a variety of stressful situations rheumatoid arthritis developed. Previous to the onset of rheumatoid arthritis such patients divert their hostile impulses into a variety of competitive sports (men) and domestic work (women), but at the onset of the disease, the anger is turned inward, sublimation into physical activity ceases, and the combination of the rheumatoid factor and weak ego somehow directs the whole process to the pathology of rheumatoid arthritis. It may be possible that if this anger were not allowed to develop or were dissipated initially (similar to the early gratification of oral needs of people with high pepsinogen level), rheumatoid arthritis would not develop even with a congenitally weak ego and the presence of the rheumatoid factor (p. 79.)

Solomon & Moos (1965), in a study of the relationships of personality to the presence of rheumatoid factor in asymptomatic relatives of patients with rheumatoid arthritis, compared patients and relatives psychologically by means of MMPI. They speculated from the study that emotional disturbance in conjunction with rheumatoid factor may lead to rheumatoid arthritis. In addition, although the presence of rheumatoid factor in a healthy individual seems to be related to well functioning psychological defenses, it is possible that the kind of adaptations of rheumatoid arthritic positive relatives are similar to those of persons with

rheumatoid arthritis, but that they are working better, either as a result of greater ego strength, or of less environmental stress. Solomon & Moos also note that inhibition of aggression and concern about appearances have been found in patients with rheumatoid arthritis. Thus a propensity to formation of the rheumatoid factor might be linked to a psychological mechanism, but still needs to be coupled with some degree of decompensation in order to lead to disease. Solomon & Moos state that

> a reasonable hypothesis based upon the present data would seem to be that, given a genetic or constitutional predisposition to rheumatoid disease, expressed in some individuals by the presence of rheumatoid factor, only those individuals with significant emotional conflict and psychologic stress go on to the development of the disease, the rate of progression of which may be related to the degree of psychic turmoil (p. 357).

Thus individuals with rheumatoid factor but without manifest rheumatoid disease must be in good psychological equilibrium; if they were not, they might be expected to become physically ill.

Groen & Welner (1966), in a study of the biological basis of psychosomatic medicine, include rheumatoid arthritis along with peptic ulcer, asthma, ulcerative colitis, and hypertension. They postulated that the specificity of the psychosomatic disorder is explained by the uniqueness of each individual's personality, and by the stressful nature

which a certain environmental situation can acquire because of its specific meaning for the individual. Every reaction of the organism involving its total behavior is determined by the individual characteristics of the personality. This in turn is the product of the genetic, developmental, and environmental factors by which each organism acquires its individual characteristics. When the organism meets with a stress the ensuing behavior is determined both by the characteristics of the personality and of the stress situation. They continued to say that in their studies of patients with psychosomatic disorders, they found that these individuals inhibited their activities along mimical, vocal, or neuromuscular pathways to a high degree. Groen & Welner felt that western education more and more directed toward self-control; restrained "gentlemanly" or "ladylike" behavior had controlled these individuals to such a degree that in a situation of frustration they could not act out in the typical healthy, sociopathic, or psychoneurotic patterns.

A recent study by Meyerowitz, Jacox, & Hess (1968), with a sample of eight sets of juvenile and adult monozygotic twins, discordant for rheumatoid arthritis, revealed findings of psychological stress occurring prior to the disease onset in the affected member of four out of five sets of adult twins studied. In the three younger pairs,

the discordant experience of psychological stress was only suggested in two and not seen at all in the third affected twin.

A medical-psychiatric study of patients with rheumatoid arthrits by Shochet et al (1969) was undertaken to examine how life circumstances affected the course of the illness, and to determine if there were discernible precipitating psychological factors in exacerbation of the illness. In the 12 cases studied, they observed in longitudinal perspective that life stress had a definite relationship to change in clinical manifestations of the disease. A clearly defined life crisis could be delineated in association with or preceding the onset of the arthritis (if relatively recent) or the most recent exacerbation. These life crises had in common the threat of loss or actual loss of a loved object (separation) with arousal of feelings of rage which the patient was unable to tolerate, effectively express, or cope with. These patients seemed to react symptomatically to these crises with the development of a physiological disturbance which was substituted for a direct confrontation of the problem. Exacerbations of the illness were particularly related to situational crises, psychological vulnerability and physical predisposition.

In summary, the 'disease onset hypothesis' concerns itself with the relationship of stress and rheumatoid arthritis. There seems to be some general concensus among the majority of these studies that acute or chronic stress is the 'tipping' mechanism toward a disease state when superimposed upon a particular personality constellation. Some importance is placed upon the concept of individual differences in experiencing degrees of stress. Several investigators indicated that the presence of an undefined, underlying genetic predisposition, combined with stress and a particular personality constellation, are important aetiological factors worth considering.

Disease Course Hypothesis

Meyerowitz (1971) describes this third hypothesis about the possible role of psychosocial variables in rheumatoid arthritis as follows:

> That identifiable psychological responses seen in patients with rheumatoid arthritis influence the course of the illness (p. 94).

In reviewing the literature there were few studies conducted in relation to this particular hypothesis.

Moos & Solomon (1964b) studied two groups of rheumatoid arthritic patients in an attempt to identify the personality correlates of the rapidity of progression of the disease.

The first was judged to have a rapidly progressive course, based on shorter duration of disease and greater severity (according to functional class and anatomical stage); the second had a slowly progressive course with longer duration and less severity. The results of a personality trait scale derived from the MMPI revealed that patients with slow progression scored higher on scales reflecting compliance-subservience, denial of hostility and social responsibility, generally reflecting adequate adaptation. Patients with rapid progression revealed scores suggesting that they "were experiencing feelings of ego disorganization with concomitant increase in anxiety and depression and decrease in the ability to continue former modes of psychological adaptation and coping" (p. 150). Moos & Solomon concluded that it was unclear whether the psychological phenomena reflected reactions to different disease courses or whether they reflected personality differences present before illness onset and subsequently influencing the course of the illness.

Molodofsky & Chester (1970) studied pain and mood patterns in rheumatoid arthritic patients, both male and female, in a longitudinal fashion with twice daily mood and pain ratings utilizing standard techniques for both kinds

of observations. The investigators were able to demonstrate two different types of pain-mood patterns. In one group of patients there was a synchronous state of pain-mood associations whereby mood changes in a spectrum of anxiety or hostility were closely related to fluctuations in joint tenderness. The second group revealed a paradoxical state characterized by an inverse relationship between intensity of joint tenderness and a sense of hopelessness. The patients' age, sex, social class, duration of illness, radiologic joint changes, functional disability and medication bore no relationship to these patterns. Molodofsky & Chester found that in a one-two year follow-up of these two groups a less favourable outcome of the illness was demonstrated in the case of the paradoxical group.

Another study by Moos & Solomon (1964a) was conducted on two groups of rheumatoid arthritic patients, one judged to be favorably responsive and one unfavorably responsive to treatment according to the rating of their physicians. The psychological findings for the two groups were very similar to those which distinguished patients according to rapidity of disease progression. Scores for the first group reflected ego strength, while the second group was characterized by lack of impulse control, alienation, anxiety and depression.

In summary, this third section discusses the few studies done in the area of the 'disease course hypothesis' which is the relationship of psychosocial variables to the illness course. Indications are that the disease process progresses slower with rheumatoid arthritics who have a greater degree of ego strength and have maintained adequate adaptation.

Summary

Chapter II has been concerned with the literature centering around psychosocial variables in rheumatoid arthritics. Three psychological hypotheses (specificity, disease onset, and disease course) have been described and discussed.

However, all of these studies represent retrospective data obtained after the illness onset, thus making it impossible to know to what extent the psychological responses are a reaction to the illness state itself. Until predictive studies are conducted, it remains impossible critically to test the specificity and disease onset hypotheses.

CHAPTER III

METHOD AND RESEARCH DESIGN

The Sample

Criteria for Subjects. The sample under investigation in this study was limited by the number of available rheumatoid arthritics willing to commit themselves to this study, who also fulfilled the following additional criteria: subjects were required to be non-hospitalized individuals between the ages of 20 and 60, clinically diagnosed as rheumatoid arthritic, who had suffered little joint damage and no additional physical limitations such as heart disease. The 20 subjects obtained fulfilled these criteria with the exception of one subject who had serious joint damage in both upper and lower extremities. Since the investigator felt it necessary to obtain a minimum of 20 subjects for this study this particular subject was included.

Procedure for Procuring Subjects. 1. Names of potential subjects were obtained through the rheumatoid arthritic clinic lists and physiotherapy department of the University of Alberta Hospital, several doctors' private patients, and through advertising in the University of Alberta and community newspapers.

2. A list of approximately 75 individuals was com-

piled, from which individuals were then contacted via telephone as to their interest in participating in this study. Fifty-two individuals responded favorably, and those individuals who did not come directly from either the rheumatoid arthritic clinic lists or doctors' recommendations were verified as to their diagnosis of rheumatoid arthritis through their individual doctors.

3. All screened individuals were given a two- to three-hour personal interview in their own home (three exceptions) by the investigator, during which the potential subjects were made aware that this study was an investigation into personality and rheumatoid arthritis, and at which time a detailed explanation of the time commitment to the study was given. The underlying hypothesis of this study was not made known to any of the subjects.

4. The list of 75 potential subjects narrowed to 20 active subjects, largely because of the extensive time commitment necessary for participation in the study, prior plans of individuals, and other unknown variables.

Distribution of Subjects. Using a random digit table the investigator assigned the 20 subjects to one of three groups. The six men and 14 women were randomly assigned separately to ensure a representation of both sexes in all three groups. (See Appendix A for description of sample.)

1. Control group. This group was composed of one man and five women.

2. Placebo group. This group was composed of two men and four women in order to replicate the sexual distribution in the treatment group as closely as possible. This group was brought together during the treatment period for the same amount of time as the treatment group. The subjects in this group, however, received no treatment that could be considered as an identifiable type of psychotherapy.

3. Treatment group. This group was composed of three men and five women. The importance of having a minimum of eight subjects to facilitate group interaction was stressed by the treatment group psychotherapist. These subjects received the designated treatment of group psychotherapy during the treatment period. Halfway through the study one of the female subjects dropped out because of expressed feelings of nervousness and ill health, eliminating these data from the final analysis.

Research Instruments

The research instruments used in this study were two psychological questionnaires, three physical change measures, aspirin intake, and subjective evaluation. It was assumed that if some changes were to occur within the behavior pat-

terns of the subjects, these changes would be reflected in the measuring instruments.

Psychological Measures. 1. The Dogmatism Scale - Form E (hereinafter referred to as the D-scale) Sawatzsky, 1968). The D-scale was designed by Rokeach for the primary purpose of measuring individual differences in openness or closedness of belief systems. Rokeach has separated his concept (which he refers to as general authoritarianism) from either left or right orientation with regard to political, economic, and religious beliefs. He reports test-retest reliability coefficients for the D-scale ranging from .68 to .93, with a median of .74, for intervals ranging from one to six months. The validity of the D-scale is based upon Rokeach's comparisons of the D-scale scores with cognitive and various other personality criteria, such as capacity to integrate new belief systems (Doodlebug problem solutions), differential aesthetic preferences (enjoyment of new musical systems), evaluations of peers, etc. (Zagona & Zurcher, 1965)

Rokeach suggests that to the extent a belief-disbelief system is closed it represents a cognitive network of defenses against anxiety. He hypothesizes that those with relatively closed systems should manifest more anxiety than those with relatively open systems. Scores on dogma-

tism and anxiety correlate from .36 to .64 in various groups tested in the United States and England, all statistically significant. Two factor-analysis studies suggested that dogmatism and anxiety are factorially similar. (Rokeach, 1960)

Rokeach's hypothesis that a relatively closed dogmatic system may represent a defense against anxiety was a strong factor in favor of choosing the D-scale for this study. It was assumed that as the subject's system of beliefs became more open that his anxiety level would decrease, which in turn would lead to a reduction of symptoms.

Each subject completed the D-scale during the first two weeks of the study (test) and again at the end of the study (retest) with approximately 9 to 11 weeks between test and retest. On the D-scale the subjects indicated disagreement or agreement with each item on a scale ranging from -3 to +3, with the 0 point excluded in order to force responses toward disagreement or agreement. This scale was subsequently converted, for scoring purposes, to a 1-to-7 scale by adding a constant to each item score. The total score was the sum of scores obtained on all items in the test.

2. The Gough-Sanford Rigidity Scale (hereinafter referred to as the Rigidity Scale). The Rigidity Scale gives an indication of the degree of flexibility and adap-

tability of a person's thinking and social behavior. Rigidity refers to the resistance to change of single beliefs or habits. (Rokeach, 1960)

The California Psychological Inventory Manual reports test-retest reliability coefficients for the Rigidity Scale ranging from .49 to .67 for intervals ranging from seven days to one year. The validity of the Rigidity Scale is based upon correlations ranging from .36 to .58 between graduate and medical students and staff's rating of "rigidity"; and with the California F (authoritarian personality) scale. (Gough, 1957)

A study by Edward (1966) implied that there was a relationship between the "building up" pattern of muscle tension and psychological rigidity. It was assumed for this study that as the muscle tension within a subject decreased, this would show as a lessening of psychological rigidity as measured by this scale.

Each subject completed the Rigidity Scale during the first two weeks of the study (test) and again at the end of the study (retest) with approximately 9 to 11 weeks between test and retest.

The Rigidity Scale is a 22-point scale which was scored by each subject with true or false for each item. The subject's total score was the sum of true responses ob-

tained on all items in the test with a high score denoting a rigid individual.

Physical Change Measures. 1. Erythrocyte Sedimentation Rate (hereinafter referred to as sed. rate). Ziff & Baum (1966) state that

> The erythrocyte sedimentation rate is the single, most important laboratory test of inflammatory activity in the connective tissue diseases (of which rheumatoid arthritis is one) (p. 238).

The normal sed. rate for men is 0-12 and for women 0-15. An increase in the sed. rate above these normals will indicate inflammatory activity within the individual. A measure of sed. rate was gained by biweekly administration of a standard sed. rate blood test at a medical laboratory.

2. Hand grip strength. According to Dr. E.G. Kidd (1971), the strength of hand grip of the rheumatoid arthritic seems to vary inversely with the degree of disease activity. Thus as the inflammatory activity decreases within the individual the hand grip strength tends to increase.

Hand grip strength was measured by a registered physiotherapist using a standard hand dynamometer in the following manner: each subject stood facing the physiotherapist with arms at sides, elbows straight with palms turned in toward the body. The dynamometer was placed first in the

right hand of the the subject, who was asked to squeeze as hard as he could. A reading was taken from the instrument which was afterward returned to the 0 position of calibration. This procedure was repeated three times for the right hand followed by three time with the left hand. The dynamometer was calibrated in kilograms which was converted to pounds at the time of data analysis. An increase in muscle strength, which might be anticipated as a result of this measure, was controlled for by repeating the hand grip measure only once every two weeks. (Muller, 1957)

3. Muscle tension. A simple test was designed to attempt to gain a measure of muscle tension within the subject. This was based on the premise that a chronically tense muscle will fatigue faster than one that is not chronically tense. (Floyd & Wellford, 1955) Increase in the length of time a subject can sustain a weight, might be an indication of less muscle tension within the subject. The investigator chose to use the main elbow flexor for this test since this muscle might be expected to have a relatively high degree of chronic muscle tension due to inhibition of the antagonists or elbow extensors (the rheumatoid arthritic subject perhaps fearful of losing control or displaying hostility in a physical manner). An increase in muscle strength, which might be anticipated as a result of this

measure, was controlled for by repeating the isometric (static) contraction only once every four weeks. (Muller, 1957) Design of muscle tension measure:

Object: to measure the fatigue level of the biceps brachii (main forearm flexor) using an isometric (static) contraction.

Equipment:

1. stop watch
2. weight pan
3. weights 2 1/2 - 25 lbs.
4. S-hook
5. one circle of canvas webbing with metal ring
6. goniometer
7. tape measure
8. three testers (one registered physiotherapist, one timer, one weight handler)

Procedure:

1. Subject standing with upper arm parallel to body, elbow held at 90° and forearm in supination thereby eliminating brachio-radial activity.
2. Canvas strap was placed two to three inches from elbow depending on subject.
3. Weights were placed on strap, and timing using a stop watch was begun. (Amount of weight was initially determined by manual muscle evaluation and visual perception regarding elbow deformity by physiotherapist. Weights varied between 2 1/2 - 25 lbs., with a mean of 10-12 lbs., and weights as initially determined for each subject were kept constant for that subject for all testing sessions.)
4. A goniometer was used by the physiotherapist to determine the length of muscle contraction prior to fatigue. The fatigue level was determined by:
   a. 5° of muscle lag into extension
   b. muscle tremor or fibrillation in protagonist (flexor group)

c. pain and/or fatigue of static fixators (shoulders, neck, trunk).

5. When the fatigue level was reached the timing was stopped, recorded, and the weights removed.
6. Both biceps brachii were measured in each subject.

Additional Measures. 1. Acetylsalicylic acid dosage (hereinafter referred to as aspirin). Aspirin is an analgesic that is widely used in the treatment of rheumatoid arthritis because of its pain-relieving properties and the fact that it is felt to exert an anti-inflammatory effect on the synovitis of rheumatoid arthritis. (Engleman, 1966)

Subjects were asked to keep a daily record of their aspirin intake. It was assumed that a decrease in the amount of aspirin intake would be indicative of less pain and inflammation.

2. Subjective evaluation. Each subject scored how he felt generally healthwise at that particular moment on a continuum of one (poor) to seven (excellent). It was thought that as the subject's physical and psychological state changed, this would be reflected along the continuum. (See Appendix A for subjective evaluation questionnaire.)

Experimental Design

The complete study was spread over 11 weeks, and was divided into three time periods. Six testing sessions were

held commencing on the eighth day of the study and repeated at two-week intervals. The measures of sed. rate, hand grip strength, and subjective evaluation were administered to all subjects at each of the six testing sessions. At the second, fourth, and sixth testing sessions the muscle tension measure was also administered to all subjects.

First Time Period. This period was designated as the pre-treatment period and was 28 days long. Subjects were mailed the D-scale, the Rigidity Scale, a personal data questionnaire (all initially returned to the investigator), and forms on which to record the dosage and kind of medication they took each day of the study.

During the first time period a baseline for all measures was established. It was thought desirable to establish a baseline since the rheumatoid arthritic disease process tends to follow a course characterized by exacerbations and remissions.

Testing sessions one and two were held on biweekly intervals within this 28-day period.

Second Time Period. This period was designated as the treatment period and was also 28 days long. All subjects continued to record their medication intake. Testing sessions three and four were held.

The control group had no other experience except that of testing sessions three and four.

The placebo group, in addition to testing sessions three and four, spent approximately 30 hours together which was divided as follows:

a. First Wednesday evening for three hours.
b. Second Wednesday evening (a week later) for three hours.
c. The weekend following the second Wednesday evening, consisting of three hours Friday evening, 11 hours Saturday, and four hours Sunday.
d. The Wednesday evening immediately following the weekend, for three hours.
e. The Wednesday evening a week later for three hours.

All of this time, with the exception of lunch on Saturday, was spent in a private home where the subjects were exposed to a variety of activities. All of the placebo sessions were taped. The individuals in charge of hosting this group's activities were both females in their twenties with no formal psychological background.

The treatment group, in addition to testing sessions three and four, also spent approximately 30 hours together which was divided as follows:

a. First Wednesday evening for three hours.
b. Second Wednesday evening (a week later) for three hours.
c. Third Wednesday evening (a week later) for three hours.
d. A weekend nine days later consisting of three hours Friday evening, 11 hours Saturday, and four hours Sunday.
e. The Wednesday evening immediately following the weekend for three hours.

The four Wednesday evenings were spent in a psychiatric interviewing room at the University of Alberta, while the weekend was held in a room designed for experiential workshops at the University. All of the treatment sessions were taped.

A male psychotherapist with extensive group experience, at present interning at Student Counselling at the University of Alberta, conducted the group psychotherapy sessions for the first two Wednesday evenings. For the remaining group sessions, he was joined by a second male psychotherapist with a Ph.D. in Educational Psychology, currently co-ordinator of staff training at the Alcohol and Drug Commission of Alberta. Since it was considered valuable to this study to use the abilities of the second psychotherapist because of qualifications in the area of the mind-body concept, the time periods for the placebo and treatment groups do not completely coincide.

Group activities:

Control group:
The control group experienced no group activity during the study.

Placebo group:
The placebo group participated in a variety of experiences designed to maintain interest while in a social context, but not to provide a psycho- and/or physical therapeutic experience. A social environment

was provided through the use of films, discussions, and playing of games, as well as experiencing handwriting analysis, clay modelling, and fortune telling, via resource persons.

Treatment group:

The treatment group was exposed to a type of group psychotherapy that focused initially on low-risk interpersonal skills, to build trust and increase the dimensions of awareness of self and others. These skills were based primarily on Wallen's (1967) and Schutz's (1969) dimensions of interpersonal relations.

In addition, emphasis was placed on the intrapersonal area, to facilitate the psycho-physical experience of deep breathing, relaxation, hypnotic induction, and bioenergetics. This therapy is based on the functional identity of the body and mind, so that any real change in a person's thinking, and therefore in his behavior and feeling, is conditioned upon a change in the functioning of his body. (Lowen,1967, 1970)

Third Time Period. This period was designated as the post-treatment period and was 22 days long. During this period all subjects continued to record their medication intake. Testing sessions five and six were held. At the end of the sixth testing session all subjects received the D-scale, the Rigidity Scale, a subjective evaluation questionnaire pertaining to the study, and instructions were given to return to the investigator via mail all of the above-mentioned questionnaires plus the completed medication forms.

Hypotheses

The hypotheses in this study are based upon the underlying assumptions in the literature that there is a 'rheumatoid personality' reactive to stress, which combined with a genetic predisposition leads to the rheumatoid arthritic disease state.

Basic Hypothesis. The mean post-treatment scores of the treatment group will differ significantly from those of the placebo and control groups. The expectation is that the placebo mean scores will exceed the control group but not the mean scores of the treatment group.

Statistical Hypotheses.

1. The D-scale mean score for the groups will be treatment < placebo < control.
2. The Rigidity Scale mean scores for the groups will be treatment < placebo < control.
3. The mean sed. rate scores for the groups will be treatment < placebo < control.
4. The hand grip strength mean scores for the groups will be treatment > placebo > control.
5. The muscle tension mean scores for the groups will be treatment > placebo > control.
6. The dosage of aspirin intake for the groups will be treatment < placebo < control.
7. The subjective evaluation scale for the groups will be treatment > placebo > control.

Analysis

The appropriate statistical tests were made using the IBM 360-67 computer, and programs prepared by the Division of Educational Research Services, University of Alberta.

A correlational analysis was conducted initially on the data between the 19 independent variables and the nine dependent variables to select the most appropriate covariates for the statistical analysis of covariance. (See Appendix B for intercorrelational Table).

In order to assess the effect of the treatment on the change of behavior, the mean scores for the treatment, placebo, and control groups for all criteria on post-treatment scores were analyzed via a one-way analysis of covariates.

A series of one-way analyses of covariance were conducted using both the pre-treatment period and the selected independent variables as covariates.

The following three tables describe the dependent and independent variables used in the study.

TABLE 1

DEPENDENT VARIABLES

Pre-and-post test scores (scores obtained one time pre-and-post tested period)

1. D-scale
2. Rigidity Scale

Mean scores over two observation times per pre-treatment, treatment, and post-treatment periods.

3. Left hand grip strength
4. Right hand grip strength
5. Sed. rate
6. Subjective evaluation

Scores obtained at one observation per pre-treatment, treatment, and post-treatment periods.

7. Left muscle tension
8. Right muscle tension

Mean scores of daily aspirin intake per pre-treatment, treatment, and post-treatment periods.

9. Aspirin intake

TABLE 2

DESCRIPTION OF INDEPENDENT VARIABLES FOR THE SAMPLE (N=19) AS A WHOLE

Coded Variables	Mean	Standard Deviation
1. Sex: coded 0=female; 1=male	0.32	0.46
2. Age in years:	44.16	10.51
3. Birth order: 1st, 2nd, etc.	2.37	1.53
4. Marital status: coded 1=single 2=separated 3=married 4=widowed 5=divorced	2.74	0.64
5. Number of children:	2.12	1.33
6. Religion, past: coded 1=protestant 2=catholic 3=other 4=none	1.26	0.44
7. Religion, present: coded 1=protestant 2=catholic 3=other 4=none	2.05	1.45
8. Religious activity: coded 1=none 2=active	1.47	0.50

Coded Variables	Mean	Standard Deviation
9. Education: coded 1=completed Jr. High School 2=completed partial High School 3=completed High School 4=completed partial University 5=completed University	3.16	1.27
10. Handedness: coded 1=left 2=right	2.00	0.00
11. Duration of illness: coded 1=0-5 years 2=6-10 years 3=11-15 years 4=16-20 years 5=21-25 years	2.53	1.14
12. Occupation, disease onset[1]: coded 1=unclassified (student unemployed) 2=unskilled-semi-skilled 3=semi-skilled-skilled + 4=professional	2.58	0.88
13. Occupation present: coded 1=unemployed, student 2=unskilled-semi-skilled 3=semi-skilled-skilled + 4=professional	2.63	1.09

[1]Modified Blishen occupational scale used for correlations. (Blishen, 1965)

Coded Variables	Mean	Standard Deviation
14. Country of birth: coded 1=Canada 2=foreign	1.21	0.41
15. Smoker: coded 0=no 1=yes	0.26	0.44
16. Number of siblings	4.74	2.24
17. Currently receiving gold injections: coded 0=no 1=yes	0.32	0.46
18. Rheumatoid factor: coded 1=negative 2=weakly reactive 3=positive	2.21	0.89
19. Currently taking medication[2]: coded 0=no 1=yes	0.53	0.50

[2]Medication included one or more of the following types of drugs: anti-inflammatory, analgesic, antibiotic, steroid, sedative, tranquilizer, hormone, diuretic.

TABLE 3

DESCRIPTION OF INDEPENDENT VARIABLES FOR THE CONTROL, PLACEBO, AND TREATMENT GROUPS

Coded Variables		Control (N=6)	Placebo (N=6)	Treatment (N=7)
1. Sex: coded 0=female 1=male	Mean	0.17	0.33	0.43
	SD	0.37	0.47	0.49
2. Age in years:	Mean	35.50	49.33	47.14
	SD	11.32	5.22	8.39
3. Birth order: 1st, 2nd, etc.	Mean	2.83	1.00	3.14
	SD	1.34	0.00	1.55
4. Marital status: coded 1=single 2=separated 3=married 4=widowed 5=divorced	Mean	2.33	2.83	3.00
	SD	0.94	0.37	0.00
5. Number of children:	Mean	1.33	2.50	2.43
	SD	1.11	0.76	1.59
6. Religion, past: coded 1=protestant 2=catholic 3=other 4=none	Mean	1.50	1.33	1.00
	SD	0.50	0.47	0.00

Coded Variables		Control (N=6)	Placebo (N=6)	Treatment (N=7)
7. Religion, present: coded 1=protestant 2=catholic 3=other 4=none	Mean SD	2.00 1.00	2.67 1.11	1.57 1.05
8. Religious activity: coded 1=none 2=active	Mean SD	1.67 0.47	1.50 0.50	1.29 0.45
9. Education: coded 1=Jr. High School 2=partial High School 3=High School 4=partial University 5=University	Mean SD	2.67 0.75	4.17 0.90	2.71 1.39
10. Handedness: coded 1=left 2=right	Mean SD	2.00 0.00	2.00 0.00	2.00 0.00
11. Duration of Illness: coded 1=0-5 years 2=6-10 years 3=11-15 years 4=16-20 years 5=21-25 years	Mean SD	3.00 1.29	2.50 0.96	2.14 0.99

Coded Variables		Control (N=6)	Placebo (N=6)	Treatment (N=7)
12. Occupation, disease onset[3]: coded 1=unemployed, student 2=unskilled-semi-skilled 3=semi-skilled-skilled + 4=professional	Mean	2.33	2.67	2.71
	SD	1.11	0.75	0.70
13. Occupation present: coded 1=unemployed, student 2=unskilled-semi-skilled 3=semi-skilled-skilled + 4=professional	Mean	2.50	2.83	2.57
	SD	1.26	0.90	1.05
14. Country of birth: coded 1=Canada 2=foreign	Mean	1.33	1.67	1.14
	SD	0.47	0.37	0.35
15. Smoker: coded 0=no 1=yes	Mean	0.50	0.17	0.14
	SD	0.50	0.37	0.35
16. Number of siblings:	Mean	3.67	3.83	6.42
	SD	1.49	1.07	2.50
17. Currently receiving gold injections: coded 0=no 1=yes	Mean	0.17	0.67	0.14
	SD	0.37	0.47	0.35

[3]Modified Blishen occupational scale used for correlations. (Blishen, 1965)

Coded Variables		Control (N=6)	Placebo (N=6)	Treatment (N=7)
18. Rheumatoid factor: coded 1=negative 2=weakly reactive 3=positive	Mean	2.17	2.00	2.43
	SD	0.90	0.82	0.90
19. Currently taking medication[4]: coded 0=no 1=yes	Mean	0.33	0.67	0.57
	SD	0.47	0.47	0.49

[4]Medication included one or more of the following types of drugs: anti-inflammatory, analgesic, antibiotic, steroid, sedative, tranquilizer, hormone, diuretic.

Summary

Chapter III was concerned with a description of the methodology involved in this study. The sample under investigation was described as well as the nature of the research instruments used. The administration of the research instruments to a small group of rheumatoid arthritics was indicated and discussed. Finally the analysis was described, including the techniques employed, and a description in table form of the dependent and independent variables used in the study.

CHAPTER IV

RESULTS

In this chapter the results of statistical analysis of data are presented and discussed. The question which this study sought to explore was "the possibility of effectively changing the behavior of the rheumatoid arthritic through the use of group psychotherapy." One basic hypothesis and seven statistical hypotheses were developed to examine this question.

This chapter is divided into eight major subdivisions, one for the basic hypothesis and one for each statistical hypothesis. The tables presented in Chapter IV represent summaries of the covariance analyses. The level of significance was set at 0.05 for all tests.

Basic Hypothesis

The basic hypothesis stated:

> The mean post-treatment scores of the treatment group will differ significantly from those of the placebo and control groups. The expectation is that the placebo mean scores will exceed the control group but not the mean scores of the treatment group.

This prediction was tested by an analysis of covariance. Nine one-way analyses of covariance were conducted using both the pre-treatment period and the selected independent variables as covariates. Separate

analyses were performed on both the right and left hand grip strength and muscle tension variables.

Preliminary manipulation of the data determined the independent variables to be selected as covariates. For this, Pearson Product-moment intercorrelations were conducted on the nine dependent variables and the 19 independent variables.

Independent variables were obtained from the personal data questionnaires, specific blood test for rheumatoid factor, and from the medication sheets.

The results of each analysis of covariance can be found in Tables 4 through 12.

It was found that in no case were differences between the three groups demonstrated at the 0.05 level of significance, and therefore the basic hypothesis was rejected in its entirety.

With the adjusted means, the analysis of covariance showed there to be no significant differences due to treatment. Only on one dependent variable, the Rigidity Scale, did the analysis of covariance show a difference that approached significance. A discussion of this variable will be presented under hypothesis 2.

Thus, although no differences among the three groups were shown to be significant, the possibility exists that there may in fact be a difference due to treatment which has not been able to be detected

due to the restricted sample size.

Statistical Hypothesis

Hypothesis 1.

Hypothesis 1 stated:

> The D-scale mean scores for the groups will be treatment < placebo < control.

Table 4 represents a summary of the analysis of covariance on the D-scale with present occupation and pre-treatment D-scale scores as covariates. Present occupation was selected as a covariate with the D-scale since it showed the highest correlation, - 0.364, of any of the independent variables according to the correlational analysis carried out initially. No significant differences were found among the three groups on the D-scale.

TABLE 4

ANALYSIS OF COVARIANCE ON THE D-SCALE WITH PRESENT OCCUPATION AND PRE-TREATMENT D-SCALE SCORES AS COVARIATES

Source of variation		df	MS	F	p
Between groups		2	425.0	1.32	0.299
Error		14	322.0		
Adjusted Means:	Control	164.0			
	Placebo	154.0			
	Treatment	148.0			

Hypothesis 2. Hypothesis 2 stated:

> The Rigidity Scale mean scores for the groups will be treatment < placebo < control.

Table 5 represents a summary of the analysis of covariance on the Rigidity Scale with age and pre-treatment Rigidity Scale scores as covariates. Present age was selected as a covariate with the Rigidity Scale since it showed the highest correlation, 0.655, of any of the independent variables according to the correlational analysis carried out initially. No significant differences were found between the three groups on the Rigidity Scale; however, the probability level of 0.07 approaches the 0.05 level of significance. The ordering of the adjusted means assumes importance, for although the treatment and placebo mean scores are very similar, they are both relatively distant from the control mean scores.

TABLE 5

ANALYSIS OF COVARIANCE ON THE RIGIDITY SCALE WITH AGE AND PRE-TREATMENT RIGIDITY SCORES AS COVARIATES

Source of variation		df	MS	F	p
Between groups		2	7.83	3.21	0.071
Error		14	2.44		
Adjusted Means:	Control	12.50			
	Placebo	9.84			
	Treatment	10.40			

Hypothesis 3. Hypothesis 3 stated:

> The mean sed. rate scores for the groups will be treatment < placebo < control.

Table 6 represents a summary of the analysis of covariance on sed. rate with duration of illness and pre-treatment sed. rate scores as covariates. Duration of illness was selected as a covariate with the sed. rate since it showed the highest correlation, 0.532, of any of the independent variables according to the correlational analysis carried out initially. No significant differences were found among the three groups on sed. rate.

TABLE 6

ANALYSIS OF COVARIANCE ON SED. RATE WITH DURATION OF ILLNESS AND PRE-TREATMENT SED. RATE SCORES AS COVARIATES

Source of variation		df	MS	F	p
Between groups		2	106.0	2.04	0.167
Error		14	51.8		
Adjusted Means:	Control	26.7			
	Placebo	21.2			
	Treatment	18.1			

Hypothesis 4. Hypothesis 4 stated:

> The hand grip strength mean scores for the groups will be treatment > placebo > control.

Tables 7 and 8 represent a summary of the analysis of covariance on right and left hand grip strength with sex and pre-treatment hand grip scores as covariates. Sex was selected as a covariate with the hand grip strength since it showed the highest correlation, 0.509 for the right hand grip strength and 0.661 for the left hand grip strength, of any of the independent variables according to the correlational analysis carried out initially. No significant differences were found between the three groups on either right or left hand grip strength.

TABLE 7

ANALYSIS OF COVARIANCE ON RIGHT HAND GRIP STRENGTH WITH SEX AND PRE-TREATMENT HAND GRIP SCORES AS COVARIATES

Source of variation		df	MS	F	p
Between groups		2	14.2	0.300	0.745
Error		14	47.1		
Adjusted Means:	Control	20.4			
	Placebo	22.8			
	Treatment	23.3			

TABLE 8

ANALYSIS OF COVARIANCE ON LEFT HAND GRIP STRENGTH WITH SEX AND PRE-TREATMENT HAND GRIP SCORES AS COVARIATES

Source of variation		df	MS	F	p
Between groups		2	5.24	0.701	0.513
Error		14	7.47		
Adjusted Means:	Control	21.9			
	Placebo	23.8			
	Treatment	23.2			

The results from this measuring instrument, however, may be viewed as somewhat unreliable due to equipment failure during the third testing session (data not included in analysis), and also failure to adjust the hand grip size on the dynamometer for each subject.

Hypothesis 5. Hypothesis 5 stated:

> The muscle tension mean scores for the groups will be treatment > placebo > control.

Tables 9 and 10 represent a summary of the analysis of covariance on right and left muscle tension with education and pre-treatment muscle tension scores as covariates. Education was selected as a covariate with muscle tension since it showed the highest correlation, 0.208 for right muscle tension and 0.324 for left muscle tension, of any of the independent variables according to

the correlational analysis carried out initially. No significant differences were found between the three groups on either right or left hand grip strength.

TABLE 9

ANALYSIS OF COVARIANCE ON RIGHT MUSCLE TENSION WITH EDUCATION AND PRE-TREATMENT MUSCLE TENSION SCORES AS COVARIATES

Source of variation		df	MS	F	p
Between groups		2	12.2	0.074	0.929
Error		14	165.0		
Adjusted Means:	Control	195.0			
	Placebo	191.0			
	Treatment	223.0			

TABLE 10

ANALYSIS OF COVARIANCE ON LEFT MUSCLE TENSION WITH EDUCATION AND PRE-TREATMENT MUSCLE TENSION SCORES AS COVARIATES

Source of variation		df	MS	F	p
Between groups		2	24.1	0.339	0.718
Error		14	71.1		
Adjusted Means:	Control	240.0			
	Placebo	205.0			
	Treatment	202.0			

Hypothesis 6. Hypothesis 6 stated.

The dosage of aspirin intake for the groups will be treatment < placebo < control.

Table 11 represents a summary of the analysis of covariance on aspirin intake with rheumatoid factor and pre-treatment aspirin intake as covariates. Rheumatoid factor was selected as a covariate with aspirin intake since it showed the highest correlation, 0.563, of any of the independent variables according to the correlational analysis carried out initially. No significant differences were found between the three groups on aspirin intake.

TABLE 11

ANALYSIS OF COVARIANCE ON ASPIRIN INTAKE WITH RHEUMATOID FACTOR AND PRE-TREATMENT ASPIRIN INTAKE AS COVARIATES

Source of variation		df	MS	F	p
Between groups		2	398.0	0.398	0.679
Error		14	1000.0		
Adjusted Means:	Control	14.5			
	Placebo	25.8			
	Treatment	31.1			

Hypothesis 7. Hypothesis 7 stated:

The subjective evaluation scale for the groups will be treatment > placebo > control.

Table 12 represents a summary of the analysis of covariance on subjective evaluation with present occupation and pre-treatment subjective evaluation scores. Present occupation was selected as a covariate with subjective evaluation since it showed the highest correlation, 0.377, of any of the independent variables according to the correlational analysis carried out initially. No significant differences were found among the three groups on subjective evaluation.

TABLE 12

ANALYSIS OF COVARIANCE ON SUBJECTIVE EVALUATION WITH PRESENT OCCUPATION AND PRE-TREATMENT SUBJECTIVE EVALUATION SCORES AS COVARIATES

Source of variation		df	MS	F	p
Between groups		2	0.200	0.218	0.807
Error		14	0.917		
Adjusted Means:	Control	5.05			
	Placebo	5.42			
	Treatment	5.36			

Summary of Findings

The results of this study showed no significant differences due to treatment. However, the Rigidity Scale adjusted mean scores come fairly close to the 0.05 level of significance.

Thus, although no differences among the three groups were shown to be significant, the possibility exists that there may in fact be a difference due to treatment which has not been able to be detected because of the restricted sample size.

CHAPTER V

SUMMARY, LIMITATIONS, CONCLUSIONS, AND IMPLICATIONS

The purpose of this study was to explore the possibility of promoting change in the behavior of rheumatoid arthritic individuals through the use of group psychotherapy.

The study yielded no statistically significant results. Thus, there is no statistical evidence for saying that the treatment was beneficial to the individuals who received it.

Several explanations suggest themselves as possible factors contributing to the failure of the study to yield statistically significant results. These include power, as related to the size of the sample, length and type of treatment, number of observations, and the types of measures used to detect change.

The primary limiting factor seems to be that of the small sample size used in the study. A real difference or positive effect might have occurred as a result of treatment but might not have been detected because of the small sample size. The restricted sample size also makes it very difficult to generalize the results to a larger population of rheumatoid arthritics.

Restriction of power also occurred as a result of the necessity of limiting the treatment period of the study.

Approximately 30 hours were spent by the subjects in the treatment group in comparison to two or three years of psychotherapy that might be expected to be needed to facilitate individual growth. Also, a more intensive type of group interaction might have been expected to occur over a longer treatment period.

Another limitation of the study is found in the types of measures used. An attempt has been made to use as many behavioral measures as possible. More physical than psychological measures were used, as they tend to be more reliable and are perhaps more meaningful as related to behavioral symptoms. Nonetheless it was feasible to measure only a few of the possible areas of change.

The study also had some built-in limitations. Random assignment of subjects to groups does not ensure that the subjects assigned to the treatment group are open to, or even seeking change. Most psychotherapies stress the importance of individual commitment in relation to behavior change. Although these subjects were volunteers to the study, there was no basis for assuming that they were, in fact, committed to change, e.g. growth.

In spite of the forementioned limitations that may have prevented significant differences from showing, an

important observation is made regarding the ordering of the adjusted means. On seven out of the nine measuring scales, the ordering of the adjusted means was in line with the underlying hypothesis of the study, showing a positive direction in favor of the treatment group as compared with the control group. One of the seven scales approached statistical significance, and on the other six scales a small positive difference was noted in favor of the treatment group as compared to the control group.

The placebo group was included in this study to permit evaluating the possibility of behavioral change taking place in individuals simply through the socializing process. It was anticipated that the placebo group would vary in a positive direction from the control group, but not as much as the treatment group. The directionality that occured in the ordering of the adjusted means showed some effect for the placebo group as well as the treatment group. These kinds of differences might be anticipated as a result of the following conditions: 1. the Hawthorne effect (Kerlinger, 1967), change occuring due to attention focused on the subject; 2. the presence of a high level of empathy within the placebo group which may be attributed to the warmth and understanding of the group leaders or other group members.

According to Carkhuff (1967), empathy is one of the conditions necessary to facilitate growth within the individual (p. 23). It is difficult from these results to know about the effects in terms of longrange growth. The treatment group should provide more lasting benefits in terms of behavioral change as compared with the placebo group since the treatment group emphasized growth skills that might be expected to continue beyond the active treatment period.

Aside from the statistical evidence, several observations were noted by the investigator during the study. First, the households of all subjects personally visited by the investigator displayed a marked degree of cleanliness and order. This observation would bear out findings previously discussed in the literature which indicated that rheumatoid arthritics are controlled, perfectionistic individuals.

Second, it was noted that when the aid of the potential subjects was first solicited, all of the subjects reached a decision,whether positive or negative, without consulting their spouse or another person. This seems to lend support to the evidence from the literature which indicated that rheumatoid arthritics are rather independent people.

A third incident of interest occurred on the occasion of the first testing session when the investigator inadvertently supplied the subjects with an incorrect room number, resulting in considerable confusion with regard to the location of the testing area. A number of subjects experienced several hours of fruitless searching before finally reaching the correct destination. While the investigator might have expected the subjects to express considerable hostility or at least dissatisfaction, instead the subjects displayed a marked lack of resentment or even lack of annoyance. This seems to reflect the personality constellation of the rheumatoid arthritic already cited in the literature in relation to the denial of emotion, particularly hostility and aggression.

A final observation was a "miracle" described by one of the male subjects in the treatment group. During the treatment group's long weekend, this subject, after an intensive session of deep breathing and relaxation, experienced no pain in one foot where there had previously been considerable discomfort. The investigator draws attention to the psycho-physical dynamic relationship already discussed in the study as a possible explanation of this occurrence. Since the end of the study, this subject has

expressed interest in continuing the psychotherapeutic process, indicating that the growth process, begun for him during the treatment period, had not been completed.

Thus, while it is not possible to conclude from this study whether group psychotherapy is an effective means of promoting behavioral change, or that socialization may produce change similar to group psychotherapy, this study may provide a useful basis for someone willing to pursue the basic assumption with a larger sample and more powerful analysis.

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A P P E N D I C E S

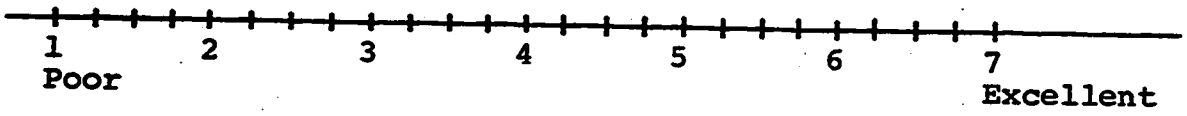
A P P E N D I X A

SUBJECTIVE EVALUATION QUESTIONNAIRE

Name: _____

Date: _____

Please indicate where you are on this scale in terms of how you feel today.



A P P E N D I X B

INTERCORRELATION AMONG THE 19 INDEPENDENT AND NINE DEPENDENT VARIABLES

PEARSON PRODUCT-MOMENT INTERCORRELATIONAL TABLE

Independent and Dependent Variables ↓	Dependent Variables: D-scale	Rigidity Scale	L.M.T.	R.M.T.	L.H.G.	R.H.G.	Sed. Rate	Aspirin	Sub. Eval.
	1	2	3	4	5	6	7	8	9
1. Sex	-0.057	-0.042	-0.037	0.136	0.661	0.509	-0.095	-0.087	0.218
2. Age	0.284	0.655	0.148	0.057	-0.128	-0.122	0.264	0.085	-0.301
3. Birth Order	0.103	0.336	-0.194	0.038	0.138	0.279	0.092	-0.171	-0.012
4. Marital Status	-0.155	0.292	-0.086	0.007	0.190	0.252	-0.031	0.336	-0.077
5. Number of Children	0.048	-0.001	-0.003	0.138	-0.017	-0.075	0.137	0.099	-0.219
6. Religion, Past	-0.033	-0.100	-0.001	-0.145	0.159	0.184	-0.040	0.117	0.110
7. Religion, Present	-0.083	-0.255	0.255	0.261	0.363	0.209	0.189	-0.208	0.428
8. Religious Activity	0.118	-0.091	0.058	-0.165	-0.213	-0.363	0.196	0.168	-0.063
9. Education	-0.261	-0.310	0.324	0.208	0.335	0.148	-0.146	0.142	0.370
10. Handedness	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11. Number of Years Ill	0.173	-0.033	0.092	0.172	0.031	-0.126	0.532	-0.014	0.214
12. Occupation, Disease Onset	-0.246	-0.100	0.106	0.095	0.508	0.404	-0.245	0.222	0.311

Independent and Dependent Variables ↓	Dependent Variables: D-scale	Rigidity Scale	L.M.T.	R.M.T.	L.H.G.	R.H.G.	Sed. Rate	Aspirin	Sub. Eval.
	1	2	3	4	5	6	7	8	9
13. Occupation at Present	-0.364	-0.480	0.168	0.202	0.553	0.451	-0.414	0.211	0.377
14. Country of Birth	0.019	-0.127	0.077	0.050	0.344	0.475	-0.183	-0.238	0.266
15. Smoker	0.014	-0.175	-0.181	-0.208	0.296	0.143	-0.019	-0.019	0.062
16. Number of Siblings	0.286	0.487	-0.159	0.016	-0.147	-0.036	0.182	0.014	-0.168
17. Gold Injections	-0.160	0.030	-0.046	0.058	0.442	0.409	-0.143	0.126	0.052
18. Rheumatoid Factor	-0.023	-0.114	0.065	-0.104	-0.187	-0.189	0.037	0.563	0.179
19. Medication	0.116	0.292	-0.066	-0.083	0.046	-0.104	0.162	0.013	-0.566
20. D-scale	1.000	0.432	-0.013	-0.135	-0.359	-0.330	0.618	-0.234	0.104
21. Rigidity Scale	0.432	1.000	-0.039	-0.084	-0.032	0.026	0.197	-0.181	-0.399
22. L.M.T.	-0.013	-0.039	1.000	0.706	-0.014	-0.115	-0.063	-0.096	0.267
23. R.M.T.	-0.135	-0.084	0.706	1.000	0.182	0.110	-0.112	-0.059	0.242
24. L.H.G.	-0.359	-0.032	-0.014	0.182	1.000	0.841	-0.402	-0.060	0.055
25. R.H.G.	-0.330	0.026	-0.115	0.110	0.841	1.000	-0.447	-0.026	0.093

Independent and Dependent Variables ↓	Dependent Variables								
	D-scale	Rigidity Scale	L.M.T.	R.M.T.	L.H.G.	R.H.G.	Sed. Rate	Aspirin	Sub. Eval.
	1	2	3	4	5	6	7	8	9
26. Sed. Rate	0.618	0.197	-0.063	-0.112	-0.402	-0.447	1.000	0.066	0.123
27. Aspirin	-0.234	-0.181	-0.096	-0.059	-0.060	-0.026	0.066	1.000	0.172
28. Subjective Evaluation	0.104	-0.399	0.267	0.242	0.055	0.093	0.123	0.172	1.000