PSYCHOLOGICAL ASPECTS OF ARTHRITIS

A thesis presented in partial fulfillment of

the requirements for the degree of

Master of Arts in Psychology

at Massey University

Bryan Rodney Crawford

1985

This thesis is dedicated to my parents

Rev. LLoyd and Mary Crawford

Abstract

Research was conducted with two groups of arthritic patients: patients with Rheumatoid Arthritis (RA) and patients with Spondyloarthritis (SA). A chronic pain, non-inflammatory disease group of patients with Osteoarthritis, and a pain-free sample of normal people were used as controls. All groups were tested with a test battery, the items of which were analyzed to identify items indicating psychopathology but which were also related to disease process. The test battery comprised questions requesting demographic information, the Beck Depression Inventory (BDI), the State-Trait Anxiety Inventory (STAI), the Buss-Durkee Hostility Inventory (BDKH), Osgood's Self Concept Scale and the McGill Pain Questionnaire (MPQ). Hypotheses investigated were that: anxiety, depression and hostility were all elevated in arthritics compared with patients with other chronic painful disorders and pain-free controls; that anxiety, depression and hostility were all elevated in people with classical RA compared with patients with SA; that current level of pain enhances the levels of anxiety, depression and hostility in all subjects; that self concept as an indicator of coping skills moderates the levels of anxiety, depression and hostility. An analysis of variance procedure was used to find significant differences between groups. A scheffe test was used as a conservative procedure. Regression analyses were used to investigate the hypotheses that pain and self concept moderated anxiety, depression and hostility. The hypotheses were partially confirmed by the results. Patients with SA were significantly more anxious and all patient groups were significantly more depressed when compared with controls, however, in general patients were no more hostile when compared with pain-free controls. Pain enhanced depression and guilt but not anxiety or any of the other hostility variables. Self concept moderated anxiety, depression and hostility. Questions in tests were disease-related and resulted in the over-diagnosis of depression. The need for longitudinal research and research into coping skills was discussed.

I am very grateful for the assistance I received from my supervisors, Malcolm Johnson who did most of the supervision and also Prof. George Shouksmith.

Thanks are also due to the Palmerston North Hospital Board for their assistance in gaining access to patients and for the helpful direction given by Dr. R.D. Wigley and Dr. H. Sheppeard.

Finally I would like to thank Dr. K. McFarland and Walt Abell for their help with the statistical analyses.

The term arthritis refers to a collection of over 100 conditions which may or may not be inflammatory (Achterberg-Lawlis, 1982). The more usual forms are rheumatoid arthritis (RA), osteoarthritis (OA), ankylosing spondylitis, systemic lupus erythematosus (SLE), and gout.

Rheumatoid arthritis is described as a chronic syndrome characterized by nonspecific, usually symmetric inflammation of the peripheral joints, potentially resulting in progressive destruction of articular and periarticular structures. It is an autoimmune disorder and can be subclassified into categories of "possible", "probable", "definite" and "classic" RA (The Merck Manual,1982). Some studies have used the presence or absence of rheumatoid factor to differentiate patients with RA (e.g. Solomon and Moos, 1964; Vollhardt, Ackerman, Grayzel and Barland, 1982). Rheumatoid factor is measured by the Fraction II hemagglutination test which measures rheumatoid factor by the agglutination of washed sheep red cells coated with Fraction II of human plasma.

Osteoarthritis is degenerative or trauma related. Many types of mechanical stresses can damage articular cartilage. Amongst the physical factors are: a single impact, gross anatomic damage, subtle mechanical derangement, joint hypermobility, multiple repeated impacts and prolonged or repeated heavy overuse of any joint or group of joints (Peyron, 1979). Of all factors studied, age can be most closely and consistently correlated with the presence of OA. The mechanism by which aging influences the onset of OA is poorly understood at present.

The prevalence of OA as assayed by x-rays of hands and feet, tends to be slightly more marked in men under 45; to be roughly equally distributed between the sexes around 45 - 55, and to show a marked predilection for women over 55. Multiple joint involvement is more frequent in females than in males.

Systemic lupus erythematosus, like RA, is an autoimmune disorder, whereas gout and ankylosing spondylitis have a strong genetic component. Ankylosing spondylitis is described as a chronic progressive form of arthritis distinguished by inflammation and eventual ankylosis of a number of joints, primarily involving the spine and paraspinal structures.

Fibrositis, muscular rheumatism and psychogenic rheumatism are other conditions frequently seen. These designations are given to the the vague unexplained aches and pains that characterize patients who are difficult to treat along established lines of medicine (Achterberg-Lawlis, 1982). Pain in and around the joints is the common denominator among these conditions which may differ otherwise in symptomatology and etiology.

At the time of King's review (King, 1955) the literature indicated that we did not have a clear picture of the role that psychological and social factors played in the predisposition towards arthritis, its onset or its exacerbation. However it was clear that such factors did have a role in some cases and that the importance of this role varied between individuals.

The influence of psychological factors as causative or reactive agents in individuals with RA has been investigated from various viewpoints. A number of psychological factors have been found to be associated with arthritic conditions including anxiety and depression (King, 1955; Polley, Swenson and Steinhilber, 1970; Mindham, Bagshaw, James and Swannell, 1981) and anger (Moos, 1964).

It has been suggested that emotional disturbance may vary according to various parameters of arthritic conditions, such as pain and type of arthritis, and according to either pre-morbid coping skills or to post-morbid development of coping skills. Meyerowitz (1966) suggested a meaningful grouping of psychological hypotheses relevant to rheumatoid disease: a specificity hypothesis which assumes identifiable psychological characteristics have been present pre-morbidly; a disease-onset hypothesis which implies that there is a significant association between certain types of life experiences and/or psychological states and the onset of rheumatoid disease; and a disease course hypothesis which suggests that identifiable psychological responses observed in persons with RA influence the course of illness.

Moos and Solomon (1964) speculated that emotional disturbance in conjunction with rheumatoid factor may lead to rheumatoid disease. They found evidence that patients with rapidly progressive disease were experiencing an inability to use previously successful coping mechanisms; were more anxious and depressed, and were not as well able to utilize the adaptive defences of compliance, compulsivity, and suppression of anger, as were those with slowly progressing disease.

Patients with rapidly progressive disease appeared to make a strong but relatively unsuccessful attempt to keep their impulses under control.

Of the psychological variables related to RA, aggression seems one of the most fruitful areas for further exploration. Both overt and covert expression of aggression are relevant and also how environmental cues leading to aggressive behaviour are processed within the nervous system; the cognitive factors involved, and the relation between aggression and anxiety (Crown, Crown and Fleming, 1975).

It may be that people with RA are characterized by increased variability in their behaviour. They may appear not to differ from control subjects in the amount of anger they express, however they may tend to suppress, control or inhibit anger, or alternatively tend to break out into almost uncontrollable rages. If these two reactions were averaged, one would find no difference in expression of anger between an arthritic and a control group; however there would be differences between the two groups in the variability of their behaviour (e.g. Cormier, Wittkower, Marcotte and Forget, 1957; Mueller, Lefkovits, Bryant and Marshall, 1961 cited in Moos, 1964). By averaging data across subjects, these studies may have consistently measured an inappropriate dimension of behaviour.

It was also found that women with RA have less even control over different kinds of aggressive impulses than do healthy women, that is, some impulses were well controlled or blocked while other impulses appeared to escape control. Amongst men, the association with RA was in the opposite direction but was not significant. Men with RA

compared with healthy men, reported less frequent impulses to general overt aggression, less wife-directed aggression, stronger guilt about such aggression, and their anger episodes were of longer duration (Kasl and Cobb, 1969).

In looking at pain-mood patterns in patients with RA, Moldofsky and Chester (1970) found two patterns: a synchronous state, characterized by mood changes within an anxiety or hostility spectrum, either closely preceding or concomitant with fluctuations in joint tenderness; and a paradoxical state, characterized by an inverse relationship between intensity of joint tenderness and a sense of hopelessness.

Using Cattell's Personality Form (16PF), Robinson, Kirk and Frye (1971) found high agreement of traits of "new" and "old" RA groups. "New" RA patients were those tested within 10 months of their first medical diagnosis, while "old" RA patients had been medically diagnosed for more than three years. An independent sample of eight new RA patients was tested with the 16PF and showed a significant profile correlation with the new RA patients previously tested and a significant profile correlation with the original sample of old RA patients. Two possible explanations are: that there is some RA personality "type" which predates the disease and plays some role in the onset and progression of the disease process, and, that the pain and crippling associated with RA forces patients to a common type regardless of their previous makeup. Unfortunately the relatively small number of patients within each diagnostic group makes any generalization rather tenuous.

In studying patients with RA using Cattell's 16PF, Moldofsky and Rothman (1971) found a significant relationship between patient's personalities and whether or not these patients had been treated with some type of oral corticosteroid. In comparison to those who had never received steroids, those who had received the drug were found to be characteristically more depressed and taciturn, complaintive and demanding, and dependent and easily upset. It could be that the prescription of oral corticosteroids is contingent on the psychological rather than the rheumatological needs of the rheumatoid patient. This does not satisfactorily answer the question of whether patients with RA experience psychological difficulties preceding disease onset, or alternatively suffer from psychological problems as a result of their disease.

A major problem in personality studies of patients in diagnostic categories is the implicit assumption that patients with a particular disease represent a homogenous sample with respect to the importance of psychological variables for that disease. Subject populations of arthritic patients in many studies reviewed were extremely diverse in age, onset and duration of symptoms, degree of disability, status as inpatients or outpatients, and type of investigator contact with subjects (e.g. clients in psychotherapy, single interview, or testing situation). In other studies there was a lack of information about patient characteristics such as intelligence and amount of medication utilized. Different findings among studies may have been merely a result of differences in particular patient characteristics. The results of various studies may have differed also, not because the arthritics were different, but because the baseline (control) against

which they were compared were different. An improvement in recent investigations has resulted from selecting subjects on the basis of the Arthritis Foundation's (1973) criteria for establishing a diagnosis of definite rheumatoid arthritis (Hoffman, 1974).

Many early studies were inadequate in terms of control comparisons. Some had no controls (Cobb 1959, 1962; Wolpaw 1960). Others lacked adequate comparisons. Mueller and Lefkovits (1956) tested a male RA group for IQ and administered the Rosenzweig Picture Frustration test and the Rorschach; while a male neurotic group were tested similarly but without the Rosenzweig test. Moos and Solomon (1964) used a sample of females from heterogenous life situations to compare Minnesota Multiphasic Personality Inventory (MMPI) response patterns of arthritics, with those of their healthy female relatives.

Differences in research findings, Hoffman felt, could be attributed to the inappropriateness of some test items to individuals with incomparable life situations which would violate the assumption underlying the use of standardized tests with norms. That is the assumption that the life situation of tested individuals is similar enough to that of comparison groups that similar interpretations may be given to identical item responses. An example of this is cited by Hoffman where Moos and Solomon (1964) averaged and compared Cohen's (1949) and Wiener's (1956) findings with their own results which included data from both male and female subjects with RA.

A lack of psychometric sophistication has been a problem in some studies. Some studies failed to use objective and standardized tests.

Wolff (1971) criticized Cobb, Schull, Harburg and Kasl (1969) in using an interview measure in order to classify respondents according to whether they had, or did not have RA. A number of social-psychological factors such as parental status stress, and arbitrary discipline, were revealed as contributing to the disease. Wolff felt it was regrettable that the tests used were retrospective and not longitudinal or predictive. Little information was yielded on the primary or secondary nature of psychosocial variables.

The presence of physical complaints associated with disease symptoms was shown to have influenced subjects' responses and subsequent MMPI profiles in a study by Nalven and O'Brien (1964). Also used in research was the Beck Depression Inventory (Zaphiropoulos and Burry, 1974). This is another inventory with a number of items which might be responded to positively as a result of arthritic disease processes, but which would indicate depression when the test is scored. Kathol and Petty (1981) state that it is difficult to be certain that the diagnosis of major depression in medically ill patients is valid. Sleep disturbance, somatic preoccupation, retardation, indecisiveness, sexual indifference, appetite disturbance with or without weight loss, and fatigue occur with significant frequency in the non-depressed medically ill population. Furthermore, severe medical disease leads to a greater frequency of these somatic complaints.

Where objective tests have been used, there have sometimes been limitations. Hoffman (1974) points out that any one individual can manifest a behavioural state, for example dependency, at some times or in some situations, and express another state, for example

independence, at other times or in other situations. The consistency of personality traits as measured by the MMPI reflects the quantitative magnitude of traits and does not assess the situational variance. Furthermore, Crown (1978) states that psychosomatic medicine has passed through and rid itself of oversimple notions such as, that persons with a particular psychological makeup or with specific conflicts and difficulties are predisposed to develop specific diseases.

There has been an overemphasis of negative personality traits in research on arthritis, obscuring positive adaptations people have made to the disease. Hoffman (1974) feels that an important area for investigation would be predictive studies that could differentiate individuals with early rheumatoid disease who may require psychological resources in order to contain successfully the disabling effects of the disease, e.g. investigations that would identify individuals who may manifest a succumbing versus a coping response to the disease process and course.

A number of studies, e.g. Solomon and Moos (1965); Rimon (1973); Crown and Crown (1973) and Vollhardt et. al. (1982), have separated patients into groups using the presence or absence of rheumatoid factor (RF) as a criterion. This is inappropriate as:

(i) This approach could find differences between groups which reflected differences in severity of disease;

(ii) It is difficult to distinguish seronegative RA from seronegative polyarthritis (polyarthritis being an inflammatory arthritis of more than one joint as defined by the New York Criteria of disease);

(iii) The RF titer can be influenced by treatment or spontaneous improvement and often falls as inflammatory joint activity decreases. Patients may therefore show different titers at different times. Also RF are not specific for RA and are found in many diseases, and also in normals. (Wright and Moll, 1976).

The weight of existing evidence from a review of the literature (Wolff, 1971) favoured the view that most, if not all of the common personality variables observed in individuals with arthritis are associated with the physical condition and symptoms, and are thus most likely secondary to the disease process. Probably biologic and psychological factors interact to influence the onset and course of rheumatoid disease (Robinson, 1972).

Pain is the common denominator in arthritic conditions. The psychological factors of anxiety, depression and hostility have been reported to have positive and independent relationships to pain and life-stress events (Leavitt, Garron and Bieliauskas, 1979). Studies of pain patients revealed that those with acute pain tended to show normal personality profiles, but the degree of pain experienced was related to the degree of anxiety present. Most chronic pain patients, like those with psychogenic pain, showed somatic preoccupations and reactive depression (Sternbach, 1975). It was also concluded that selected psychological states and traits are significantly correlated with the perception of pain (Morgan and Horstman, 1978).

As Beecher (1959) has pointed out, physiological pain sensations

are always accompanied by the apprehension of future pain, which may be conceived as a conditioned fear (anxiety) response which summates with the physiological pain (cited in Lynn and Eysenck, 1961). Others have found that degree of pain is related to the degree of anxiety present (Sternbach, 1975). Sternbach found lower pain thresholds for women and older persons and that pain tolerance is associated with the psychological state of the individual. The stoical patient usually has a pain threshold and maximum pain tolerance level quite similar to the patient who is "exaggerating" his pain. Evans (1973) suggested two types of anxiety. Some people chronically experience relatively high levels of anxiety as a personality trait or stable characteristic of their life-style However there are specific occasions and stresses to which even the relatively non-anxious person will temporarily feel highly anxious. Evans found that increasing levels of situational anxiety correlated only with increases in pain threshold, but not with pain tolerance, whereas chronic or trait anxiety was related to improvements in pain tolerance rather than pain threshold. Some researchers concluded that pain may frequently be substituted for feelings of anxiety or depression as the experience of physical pain may be less distressing than other feelings. Also as pain persists over time, anxiety appears to give way to depression (Pilling, Brannick and Swenson, 1967).

Patients with chronic pain are typically described as depressed whereas those with acute pain are typically described as anxious (Ghia, 1981). Sternbach (1974) and Pilowsky (1968) have suggested that pain patients characterized by depression or anxiety tend to exhibit more favourable response to treatment (cited in Snyder and Power, 1981).

It was suggested that chronic pain might be a central neuropsychological disorder with many similarities to depression. Swanson (1984) suggested it is more closely related to depression than anxiety, but it has sufficient characteristics of its own to distinguish it clearly from both of these other pathologic emotions. Chronic pain is therefore, in the same category as the "emotions" of anxiety and depression but they are separate phenomena that interface closely with each other.

The increased incidence of depressive reaction in a rheumatoid group of patients as compared to those with other painful locomotor disorders might be attributed to the systemic nature of rheumatoid disease, the greater persistence of pain and disability, or constant uncertainty about what the future might hold (Zaphiropoulos and Burry, 1974).

Following Engel's (1959) work with pain patients, Blumer and Heilbronn (1982) consider that recent research has led to the identification of a well defined psychobiological disorder with characteristic clinical, psychodynamic, biographic and genetic features. This syndrome is termed the pain-prone disorder and is viewed as a variant of depressive disease. In comparing patients with pain-prone disorder and patients with RA, Blumer and Heilbronn found significant differences in the duration, onset and continuity of pain. Patients with RA suffered pain twice as long with nontraumatic, gradual onset compared to the pain-prone group. Depressive traits were significantly more prevalent among the pain-prone patients and more often admitted. Impaired sleep and anhedonia (inability to engage in

social life and hobbies and to enjoy leisure time and sexual intercourse) were strikingly prevalent among the pain-prone patients.

Confirmation that there was a relationship between "persistent" pain and low self-esteem was found in a study by Elton, Stanley and Burrows (1978). They felt that treatment directed at improvement of self-esteem may produce concomitant improvement in patient's pain experience. Patients with higher self-esteem may have a greater chance to respond favourably to conventional methods of treatment of chronic pain within the framework of the usual medical approaches. Patients with low self-esteem may not benefit from such treatments, unless their psychological problems are a target for treatment as well.

Armentrout (1979) compared medical patients, chronic low back pain patients and chronic head pain patients. His data indicated that the experience of pain over a protracted period was strongly related to an individual's negative self-perception. Changes in physical activities, family patterns and occupation, all probably contributed to this lowering of the self-concept. Conversely positive self-concept in patients with chronic pain or RA may indicate ability to handle disease.

There are a range of psychological variables such as anxiety, depression and hostility that have been associated with arthritic conditions. The evidence tentatively indicates that they may be considered of peripheral or primary importance, and may contribute to disease onset. Unfortunately there is no way of conveniently determining causation without longitudinal studies whether arthritis

causes certain personality variables to appear or personality variables cause arthritis.

Early studies lacked adequate control groups for comparison and other studies lacked psychometric sophistication. Some tests measured physical complaints while purporting to measure psychological variables. Others failed to account for situational variances by measuring traits and not states, and most failed to account for the possible involvement of pain and the development of pre-morbid or post-morbid development of coping skills in amount of emotional disturbance experienced.

The proposed study attempts to redress some of the methodological inadequacies of many previous studies with improved psychometric sophistication, and in so doing attempts to clarify the relationships between various personality variables previously observed and more clearly delineated arthritic conditions, using a chronic pain, non-inflammatory disease control group (OA), and a pain-free control group. Two groups of arthritic patients studied comprised of patients with classical RA and patients with Spondyloarthritis (SA), as defined by Wright and Moll (1976). All groups were tested with a test battery, the items of which were analyzed to identify items indicating psychopathology but which were also related to disease process.

The hypotheses to be investigated were:

1) That anxiety, depression and hostility are all elevated in arthritics compared with patients with other chronic painful disorders and pain-free controls.

2) That anxiety, depression and hostility are all elevated in people with classical RA compared with patients with the Spondyloarthropathies.
3) That current level of pain enhances the levels of anxiety, depression and hostility in all subjects.
4) That self-concept as an indicator of coping skills moderates the levels of anxiety, depression and hostility.

Subjects:

There were three experimental groups of 15 subjects each, and a control group of 20 subjects. Subjects were from both sexes with ages ranging from 15 to 83. Testing began 1/8/1983 and was completed by 15/4/1984.

All experimental subjects were patients from the Palmerston North, Hawkes Bay, Wairarapa and Wanganui Hospital Boards. Control subjects were excluded from participation if they experienced chronic pain. Three subjects were excluded from the research because of this criterion. Selection of the control subjects was made by approaching occupants of alternate houses from four streets within Palmerston North city. The four streets consisted of a newly established area, an older established area, a street with occupants of high socio-economic status, and a street with occupants of low socio-economic status.

Inclusion criteria for the experimental groups were:

1) That subjects had a diagnosis of OA. Diagnosis was made by a rheumatology specialist from the Palmerston North Hospital Board. Any two of crepitus, pain and body swelling were used as criteria for diagnosis (Wigley, Manahan, Caragay, Muirden, Valkenberg, Allander and Prior, 1983).
2) That subjects had at least 7 of the 11 criteria for classical RA (see appendix 1), and joint symptoms including swelling, had been continuous for at least six weeks.

3) That subjects had a diagnosis of Spondyloarthritis (Ankylosing Spondylitis or Psoriatic Arthritis - see appendix 2 for the diagnostic criteria used with Ankylosing Spondylitis).

Test Battery:

The test battery (see appendix 3) comprised:

a) An introductory letter which briefly explained the purposes of the research and assured confidentiality. Minor alterations were made according to whether the battery was given to an experimental or control subject.
b) A demographic sheet which requested the subject's name if he were from the control group, or made provision for a number to be allocated if he were from an experimental group.
c) The Beck Depression Inventory (BDI).
d) The State-Trait Anxiety Inventory (STAI).
e) The Buss-Durkee Hostility Inventory (BDKH).
f) Osgood's Self Concept Scale.
g) The McGill Pain Questionnaire (MPQ) which was used for experimental groups only.

The Beck Depression Inventory (Beck, Ward, Mendelson, Mock and Erbaugh, 1961) is one of the commonest depression inventories in clinical and research use. There are 21 items, each with a four-point scale. Beck et.al. (1961) concluded that studies of the internal consistency and stability of the instrument indicated a high degree of

reliability. Comparisons between the scores on the inventory and the clinical judgments by diagnosticians indicated a high degree of validity, 97% within one degree on a four-point scale of depression (none, mild, moderate, severe). The value of the BDI as a method of assessing the level of depression has been confirmed by a British study, the results of which agree with those of the original validation carried out in the United States (Metcalfe and Goldman, 1965). Self administration did not appear to reduce validity (Nielsen and Williams, 1980).

It is within this inventory that it is important to clarify items related to disease processes as well as depression, as over-diagnosis is undoubtedly occuring in clinical settings. The BDI includes amongst its questions items inquiring about physiological functioning, which Kathol and Petty (1981) suggest might be a result of disease process items 13, 16, 17, 18, 19, 20, 21). These questions were separated for analysis. Disease-related questions were extracted and summed to a disease-related total. A third total was constructed by subtracting disease-related questions from the BDI to form a depression score unrelated to disease. Subjects were further classified according to Beck's categories of: 0 - 9 = not depressed; 10 - 15 = mildly depressed; 16 - 23 = moderately depressed; 24 - 63 = severely depressed.

The State-Trait Anxiety Inventory (Spielberger, Gorsuch and Lushene 1968) is an anxiety inventory in common clinical and research use. It consists of 40 brief items and offers measures of how the respondent generally feels (Trait Anxiety) and how he feels at the time

of testing (State Anxiety). Validities for trait scores were estimated by correlating the scores with the IPAT Anxiety Scale, Manifest Anxiety Scale, and Affect Adjective Check List. For 126 college women, coefficients were .75, .80, and .52 respectively (Dreger, 1978). The authors provide data from the standardization samples that show that the trait scores are related to real-life criteria. State comparisons could not be made because the specific circumstances of samples are not reported. A disadvantage is that the STAI is open to faking. The revised STAI is however, one of the best standardized of anxiety measures, if not the best.

The STAI was scored in the usual format with separate scores for State and Trait anxiety. Items that were related to disease processes (questions 5, 8, 10, 22, 26) were selected by a prominent rheumatologist and removed to create new totals of State and Trait anxiety that were unrelated to disease.

The Buss-Durkee Hostility Inventory (Buss and Durkee, 1957) is one of the few measures of hostility available and has been used previously by Rimon (1973) with arthritis sufferers. It attempts to measure components of aggressiveness by using eight item categories, which together tap a variety of aggressive behaviours and hostile attitudes. These are also combined into a single score. Four item categories measure the tendencies to the instrumental response of aggression and anger. Two other categories measure various hostile attitudes, and the final category Guilt gives information of guilt feelings secondary to conscious or inhibited unconscious aggressive impulses.

Whilst validities for the scale are not yet available, items were scaled for social desirability, and social desirability was correlated with probability of endorsement. The correlations of social desirability and probability of endorsement were .27 and .30 for college men and women respectively, and were considerably smaller than those of previous studies (Buss and Durkee, 1957).

The BDKH was scored using the eight scales separately; by combining Assault, Indirect Hostility, Irritability and Verbal Hostility into a Motor component of hostility, and by combining Resentment and Suspicion into an Attitude component of Hostility. All eight scales were also totalled to make a total Hostility score using all 75 questions.

The Self Concept scales (Osgood, Suci and Tannenbaum, 1957) consist of 12 adjective pairs where the subject is asked to describe himself on a scale of 1 to 7. These were scored by assigning a value to the word pairs, 1 being allocated to the left hand side of each word pair. All measures used in Osgood's scale were originally used by Osgood et. al. (1957) and Humphrey and Argyle (1962). Measures were selected particularly on the basis of (1) Warr and Knapper's (1968) work on perception of people, and (2) as a result of pilot studies at Queen's University, Belfast (Shouksmith, 1969).

The McGill Pain Questionnaire (Melzack, 1975) consists of 78 adjectives that describe how a person's pain may feel in the present time. Three additional questions ask how the person's pain changes with time, and six other questions ask how strong the person's pain is.

Part 1 of the questionnaire was deleted because this information was not quantifiable to compare across groups. The MPQ represents a useful tool for examining the dimensions of pain:

(1) It provides quantitative information that can be treated statistically;

(2) It is sufficiently sensitive to detect differences among different methods to relieve pain;

(3) It provides information about the relative effects of a given manipulation on the Sensory, Affective, and Evaluative dimensions of pain.

This is a measure of current pain which has been validated for arthritis sufferers (Dubuisson and Melzack, 1976). Scoring was according to Melzack's (1975) system with totals for Sensory, Affective, Evaluative, Total (Sensory, Affective and Evaluative combined), Miscellaneous, Number of Words Chosen (NWC), and Present Pain Intensity (PPI).

The psychological inventories administered are all standardized and well validated measures which have been frequently used in similar studies. In the present study they are used in a combination not previously reported in the literature, particularly in the use of the semantic-differential based measure of Self Concept. The use of standardized measures ensures that only measures which have previously been found to be acceptable to subject groups, both clinical and normal, are included in the study.

Procedure

Experimental subjects were approached by a Hospital Board employee during clinic appointments or in their homes in the Palmerston North, Hawkes Bay, Wairarapa and Wanganui Hospital Board areas. Subjects who did not fit one of the three diagnostic categories were excluded from the research. Similarly, subjects who did not fully complete their questionnaires were excluded.

Control subjects were approached in their homes and asked if they would be willing to participate in research into arthritis by filling out a questionnaire. Subjects who were unable to participate because they were experiencing chronic pain were excluded from the research as were those who did not fully complete their questionnaires.

All information was kept confidential and data was grouped to help increase confidentiality, and for statistical purposes. Experimental subjects were given a code number to protect their identities and enable the experimenter to conduct statistical analysis whilst blind to diagnostic categories.

Analysis

An analysis of variance (ANOVA) procedure was used to find significant differences between groups. The Scheffe test was used as a conservative procedure.

Regression analyses were used to investigate the hypotheses that pain and self concept had an effect on anxiety, depression and hostility. Demographic variables were regarded as preexisting the disease state, so an historical basis of entry was used through forced stepwise regression. Demographic variables were partialled out to remove the effects of age, sex of respondent, length of illness, and type of illness (group membership). Self concepts were entered before pain variables because they were regarded as preceding the pain of disease in contributing to the person's psychological state.

Self concepts often appeared to be disease-related, therefore self concept could have changed with disease rather than it being a moderator of psychopathology. To test this, pain variables were entered before self concepts, however it was found that this had no bearing on anxiety, had a bearing on only one scale of the BDKH (Guilt), and on depression only when disease-related questions were included. This form of analysis is therefore not included in the results.

Selection of Variables.

To limit the scope of the present thesis, not all of the variables measured by the questionnaire have been analysed. Some demographic data were omitted and in the regression analyses other demographic variables were partialled out to find the contributrion of self concept, pain and disease, to anxiety, depression and hostility. The means and standard deviations for all variables are presented in appendix 4.

Missing Data.

Criteria were established for the treatment of missing data with listwise deletion of missing cases used in the analyses. Subject numbers consequently vary slightly between analyses. Respondents with more than two missing items of the STAI, more than three on the BDI or Self Concept scales, or more than four on the BDKH were excluded from analysis involving those scales. The BDI results of one subject which were excluded from other analyses because of missing items have been included in Table 5 as they are of clinical significance.

Demographic Data.

Demographic data for the four groups are summarized in Table 1. Group 1 was a control group, groups 2 and 4 were people with an inflammatory joint disease; RA in group 2 and SA (Ankylosing

Spondylitis or Psoriatic Arthritis) in group 4; whilst group 3 were people with OA (degenerative joint disease or pain group). From Table 1 it can be seen that although the mean ages of groups 1 and 4 is lower than the mean ages of groups 2 and 3, mean age of onset of disease also varies between groups. When mean age of onset is subtracted from mean age there is little difference in mean length of illness between groups (12, 13, and 14 years for groups 2,3, and 4 respectively).

Table 1 Demographic Data For The Four Groups

Group	N	Males	Females	Mean Age	Mean Age of Disease Onset	Mean Years of Education
1 Control	20	7	13	32.350	-	13.105
2 RA	15	6	9	55.867	43.667	9.467
3 OA(pain)	15	7	8	59.333	46.067	11.067
4 SA	15	10	5	34.533	20.267	11.800

Analysis for Hypothesis 1.

Hypothesis 1 predicted that anxiety, depression and hostility would be elevated in patients with RA and SA compared with patients with a chronic painful disorder (OA) and pain-free controls. As a conservative procedure, a Scheffe test was used to find significant differences between groups. Results are shown in Table 3.

Table 3 Variable Means Found Significantly Different Between Groups

Test	Variable	Group	N	Mean
STAI	State Anxiety	1(C)	20	28.3500
		2(RA)	15	33.8667
		3(OA)	14	35.3571
		4(SA)	15	38.0667*
STAI	Trait Anxiety	1(C)	20	32.4500
		2(RA)	15	37.0667
		3(OA)	14	39.2857
		4(SA)	15	41.1333*
BDI	All questions	1(C)	20	2.3000
		2(RA)	15	9.3333*
		3(OA)	14	7.5714*
		4(SA)	15	8.0000*
BDI	Disease-related questions	1(C)	20	1.2000
		2(RA)	15	4.7333*
		3(OA)	14	4.4286*
		4(SA)	15	3.2667
BDI	Disease-related questions removed	1(C)	20	1.1000
		2(RA)	15	4.6000*
		3(OA)	15	2.9333
		4(SA)	15	4.7333*
BDKH	Suspicion	1(C)	20	2.1000
		2(RA)	15	2.3333
		3(OA)	15	4.1333*
		4(SA)	15	2.3333
Self Concept	Fast-Slow	1(C)	20	2.6500
		2(RA)	15	4.6000*
		3(OA)	15	3.8000
		4(SA)	15	4.1333*

* Denotes groups significantly different from group 1 at the 0.050 level. No other groups were significantly different.
C = Control Group.

Hypothesis 1 was partially confirmed by the results. Group 4 was significantly more anxious on state and trait anxiety than the pain-free control group, but no two other groups were significantly different. Group 2, the other inflammatory arthritic group, was not significantly more anxious.

Of all the hostility scales, only Suspicion showed a significant difference between groups. As Table 3 shows, group 3 (OA) was significantly more Suspicious than controls, which was not as predicted.

All experimental groups were significantly more depressed when compared with pain-free controls, however once disease-related questions were removed, people with RA and SA proved to be more depressed than controls, whereas people with OA did not.

An analysis of disease-related questions in the BDI was made as shown in Table 4. Only items showing significant differences are shown. Depending on whether disease-related questions were included or removed from the BDI, different numbers of people would have been diagnosed as clinically depressed. Table 5 shows the discrepancies which would have occurred by removing disease-related questions and prorating the nett scores to make them comparable with full BDI scores. With the inclusion of the disease-related items, a higher number of people (one mild, four moderate) would be diagnosed as clinically depressed, than with the prorated non disease-related questions.

Table 4 Differences Found Between Groups On Disease-Related Items Of The BDI

Variable	DF	F Statistic	Probability	N
Question 16 (concerning sleep)	3,60	6.630	0.001	64
Question 17 (concerning being tired)	3,60	10.407	0.000	64
Question 20 (concerning health worry)	3,57	5.460	0.002	61
Question 21 (concerning sex interest)	3,57	4.658	0.006	61

Table 5 Discrepancies In The Clinical Diagnosis Of Depression

Group	Numbers Diagnosed As Depressed Using All BDI Questions		Numbers Diagnosed As Depressed Using Prorated BDI Scores After Removing Disease-Related Questions	
	Mild	Moderate	Mild	Moderate
1	1	0	1	0
2	1	3	2	1
3	4	2	2	0
4	3	1	3	1
Totals	9	6	8	2

Hypothesis 2.

Hypothesis 2 predicted that anxiety, depression and hostility would all be elevated in people with classical RA compared with patients with the Spondyloarthropathies. From Table 3 it can be seen that group 2 did not differ significantly from group 4 on any of the variables.

Hypotheses 3 and 4.

It was predicted that current level of pain would increase the levels of anxiety, depression and hostility in patients, and that self concept as an indicator of coping skills would moderate the levels of anxiety, depression and hostility.

Multiple regression was used as the main statistical method because of the multivariate relationships. It is possible to find the best set of predictors of a selected dependent variable and simultaneously evaluate the increase in prediction obtained by adding each variable sequentially. Anxiety, depression and hostility were used as dependent variables and various variables were selected to evaluate their relative importance in predicting these. Regression analyses were conducted on experimental groups only.

Initially age, sex, length of illness, and group membership were chosen to represent demographic factors. Group memberships were coded as dummy variables and entered into the regression equations. Secondly, self-concept variables were entered by forward entry. Finally, the pain variables of: Total, Number Of Words Chosen (NWC),

and Present Pain Intensity (PPI) were entered by forward entry.

Table 6 shows a summary of regression analysis when form a of the STAI (state anxiety) was used as the dependent variable, before and after the removal of disease-related questions.

Table 6 Summary Data On Regression Analysis Of State Anxiety

Dependent Variable	Independent Variable	RSQ	RSQch	Fch	DF	P
State Anxiety	Age	.1090	.1090	5.015	1,39	<.05
(disease-related	Sex	.1090	.0000	0.000	1,38	n.s.
questions	Length of illness	.1102	.0012	0.053	1,37	n.s.
included)	Group membership	.1399	.0297	0.656	1,36	n.s.
	Insecure-Secure	.3223	.1824	9.691	1,35	<.005
	Fast-Slow	.4013	.0790	4.619	1,34	<.05

$F(7,34) = 3.25603$; $p = 0.0094$ for final RSQ

State Anxiety	Age	.1231	.1231	5.757	1,39	<.05
(disease-related	Sex	.1232	.0000	0.002	1,38	n.s.
questions removed)	Length of illness	.1239	.0008	0.034	1,37	n.s.
	Group membership	.1568	.0329	0.741	1,36	n.s.
	Insecure-Secure	.3631	.2062	11.657	1,35	<.005
	Fast-Slow	.4336	.0706	4.361	1,34	<.05

$F(7,34) = 3.71884$; $p = 0.0043$ for final RSQ

Of the demographic variables, only age made a significant contribution in predicting state anxiety when disease-related questions were either included or excluded. Increasing Insecurity and Slowness were both associated with increasing state anxiety. No pain variables were selected as contributing significantly to the prediction. Removing disease-related questions resulted in a greater amount of the variance being accounted for in the equations (43.36% vs 40.13% in Table 6).

Table 7 shows a summary of regression analysis when form b of the STAI (trait anxiety) was used as the dependent variable. None of the demographic variables made a significant contribution in predicting trait anxiety when disease-related items were included or excluded. Increasing Worthlessness was associated with increasing trait anxiety in both cases and increasing Delicateness was associated with increasing trait anxiety when disease-related questions were included in the dependent variable. No pain variables were selected as making a significant contribution to the prediction. A greater amount of variance in the equation was accounted for when disease-related questions were included (45.51% vs 42.53%).

Table 7 Summary Data On Regression Analysis Of Trait Anxiety With Disease-Related Questions Included And Excluded

Dependent Variable	Independent Variable	RSQ	RSQch	Fch	DF	P
Trait Anxiety	Age	.0717	.0717	3.168	1,39	n.s.
(disease-related	Sex	.0728	.0011	0.046	1,38	n.s.
questions	Length of illness	.0729	.0001	0.003	1,37	n.s.
included)	Group membership	.1241	.0512	1.112	1,36	n.s.
	Valuable-Worthless	.3806	.2565	14.909	1,35	<.000
	Delicate-Rugged	.4551	.0744	4.781	1,34	<.05
F(7,34) = 4.05588; p = 0.0025 for final RSQ						
Trait Anxiety	Age	.0765	.0765	3.398	1,39	n.s.
(disease-related	Sex	.0801	.0035	0.154	1,38	n.s.
questions	Length of illness	.0812	.0011	0.048	1,37	n.s.
removed)	Group Membership	.1367	.0555	1.221	1,36	n.s.
	Valuable-Worthless	.4253	.2885	18.074	1,35	<.000
F(6,35) = 4.31619; p = 0.0023 for final RSQ						

Table 8 shows a summary of regression analysis when the BDI was used as the dependent variable. Analyses were also made with disease-related questions extracted and used as the dependent variable, and after disease-related questions were removed from the BDI.

Of the demographic variables, only age made a significant contribution in predicting disease-related depression, and length of illness in predicting depression unrelated to disease. Of the self concepts, increasing Delicateness was associated with increasing depression and increasing Weakness was associated with increasing disease-related depression. Increasing Dullness and Fairness was associated with increasing depression unrelated to disease. Of the pain variables, only PPI was selected as making a significant contribution to depression and disease- related depression. Pain was not selected as significantly predicting depression unrelated to disease, and the greatest amount of variance accounted for was when disease-related questions were removed from the BDI.

Table 8 Summary Data On Regression Analysis Of Depression

Dependent Variable	Independent Variable	RSQ	RSQch	Fch	DF	P
Depression	Age	.0298	.0298	1.260	1,39	n.s.
(all questions	Sex	.0704	.0406	1.748	1,38	n.s.
included)	Length of illness	.1840	.0635	2.860	1,37	n.s.
	Group membership	.1471	.0131	0.292	1,36	n.s.
	Delicate-Rugged	.2774	.1304	6.495	1,35	<.05
	PPI	.4177	.1402	8.429	1,34	<.01
F(7,34) = 3.48366; p = 0.0064 for final RSQ						
Depression	Age	.1376	.1376	6.540	1,39	<.05
(disease-related	Sex	.1736	.0360	1.743	1,38	n.s.
questions)	Length of illness	.1737	.0001	0.005	1,37	n.s.
	Group membership	.1749	.0012	0.028	1,36	n.s.
	Strong-Weak	.2724	.0975	4.826	1,35	<.05
	PPI	.3521	.0796	4.301	1,34	<.05
F(7,34) = 2.63921; p = 0.0272 for final RSQ						
Depression	Age	.0019	.0019	0.078	1,39	n.s.
(disease-related	Sex	.0234	.0215	0.879	1,38	n.s.
questions	Length of illness	.1714	.1480	6.965	1,37	<.05
removed)	Group membership	.1990	.0276	0.655	1,36	n.s.
	Dull-Sharp	.3159	.1169	6.152	1,35	<.05
	Fair-Unfair	.4263	.1104	6.736	1,34	<.05
F(7,34) = 3.60919; p = 0.0052 for final RSQ						

Table 9 shows a summary of regression analysis when the BDKH was used as the dependent variable.

Of the demographic variables, age made a significant contribution in predicting Assault, Indirect Hostility and Motor Hostility; sex was significant in predicting Assault, Verbal and Motor Hostility; and group membership was significant in predicting Suspicion and Attitude Hostility.

Of the self concepts, increasing Unpleasantness was associated with increasing Assault; increasing Activeness was associated with increasing Indirect Hostility; and increasing Insecurity was associated with increasing Indirect Hostility and Guilt. Increasing Unfairness was associated with increasing Resentment, Suspicion, Verbal Hostility, Motor Hostility, Attitude Hostility and Total Hostility; and increasing Dullness was associated with increasing Verbal Hostility. The only pain variable selected was NWC which was significant in predicting Guilt. Of all the Hostility variables, the greatest amount of variance was accounted for in predicting Assault.

Table 9 Summary Data On Regression Analysis Of Hostility

Dependent Variable	Independent Variable	RSQ	RSQch	Fch	DF	P
Assault	Age	.1124	.1124	5.317	1,40	<.05
	Sex	.2418	.1294	6.999	1,39	<.05
	Length of illness	.2431	.0013	0.070	1,38	n.s.
	Group membership	.2899	.0467	1.284	1,37	n.s.
	Pleasant-Unpleasant	.4066	.1167	7.275	1,36	<.05
F(6,36) = 4.11065;	p = 0.0030 for final RSQ					
Indirect Hostility	Age	.1649	.1649	8.292	1,40	<.01
	Sex	.1819	.0170	0.852	1,39	n.s.
	Length of illness	.1935	.0116	0.576	1,38	n.s.
	Group membership	.1968	.0033	0.080	1,37	n.s.
	Passive-Active	.2915	.0948	4.949	1,36	<.05
	Insecure-Secure	.4222	.1306	8.138	1,35	<.01
F(7,35) = 3.65287;	p = 0.0046 for final RSQ					
Resentment	Age	.0010	.0010	0.044	1,40	n.s.
	Sex	.0010	.0000	0.000	1,39	n.s.
	Length of illness	.0123	.0113	0.457	1,38	n.s.
	Group membership	.1098	.0975	2.136	1,37	n.s.
	Fair-Unfair	.2874	.1776	9.220	1,36	<.005
F(6,36) = 2.41985;	p = 0.0456 for final RSQ					
Suspicion	Age	.0138	.0138	0.589	1,40	n.s.
	Sex	.0156	.0018	0.076	1,39	n.s.
	Length of illness	.0274	.0117	0.482	1,38	n.s.
	Group membership	.2550	.2277	5.959	1,37	<.01
	Fair-Unfair	.3542	.0992	5.684	1,36	<.05
F(6,36) = 3.29141;	p = 0.0110 for final RSQ					
Verbal Hostility	Age	.0411	.0411	1.801	1,40	n.s.
	Sex	.1737	.1326	6.580	1,39	<.05
	Length of illness	.1811	.0073	0.358	1,38	n.s.
	Group membership	.1982	.0171	0.417	1,37	n.s.
	Fair-Unfair	.2964	.0982	5.164	1,36	<.05
	Dull-Sharp	.3774	.0810	4.686	1,35	<.05
F(7,35) = 3.03127;	p = 0.0134 for final RSQ					
Guilt	Age	.0233	.0233	1.003	1,40	n.s.
	Sex	.0337	.0104	0.442	1,39	n.s.
	Length of illness	.0348	.0011	0.044	1,38	n.s.
	Group membership	.0458	.0111	0.044	1,37	n.s.
	Insecure-Secure	.2081	.1622	7.580	1,36	<.01
	Number Words Chosen	.3378	.1297	7.053	1,35	<.05
F(7,35) = 2.55072;	p = 0.0312 for final RSQ					

Table 9 (continued)

Dependent Variable	Independent Variable	RSQ	RSQch	Fch	DF	P
Motor Hostility	Age	.1247	.1247	5.983	1,40	<.05
	Sex	.2073	.0826	4.275	1,39	<.05
	Length of illness	.2109	.0036	0.183	1,38	n.s.
	Group membership	.2173	.0064	0.158	1,37	n.s.
	Fair-Unfair	.3368	.1195	6.665	1,36	<.05
F(6,36) = 3.04658;	p = 0.0163 for final RSQ					
Attitude Hostility	Age	.0026	.0026	0.112	1,40	n.s.
	Sex	.0033	.0006	0.027	1,39	n.s.
	Length of illness	.0034	.0001	0.002	1,38	n.s.
	Group membership	.1928	.1895	4.577	1,37	<.05
	Fair-Unfair	.3543	.1615	9.255	1,36	<.005
F(6,36) = 3.29243;	p = 0.0110 for final RSQ					
Total Hostility	Age	.0638	.0638	2.865	1,40	n.s.
	Sex	.0963	.0327	1.482	1,39	n.s.
	Length of illness	.0969	.0004	0.019	1,38	n.s.
	Group membership	.1460	.0491	1.121	1,37	n.s.
	Fair-Unfair	.3335	.1874	10.404	1,36	<.005
F(6,36) = 3.00158;	p = 0.0175 for final RSQ					

In general, variables found to be significant in predicting anxiety, depression and hostility were in the direction expected. One exception to this was the association between increasing Fairness and depression unrelated to disease.

Hypothesis 1, that anxiety,depression and hostility were all elevated in people with arthritis compared with patients with chronic pain and pain-free controls, was partially confirmed by the results. Of the two arthritic groups, these being people with Rheumatoid arthritis or the Spondyloarthropathies, only patients with SA were significantly more anxious on state and trait anxiety when compared with pain-free controls. When disease-related questions were removed from the STAI however, no significant differences were found between groups.

All patient groups were significantly more depressed than pain-free controls. When disease-related questions were removed from the BDI, the two arthritic groups were significantly more depressed as predicted. The chronic pain group had a higher loading of disease-related depression, and hence were not significantly more depressed when compared with pain-free controls on depression unrelated to disease.

The two arthritic groups did not appear to be significantly more hostile than people with chronic pain or pain-free controls. The two arthritic groups did however, describe themselves as significantly more Slow. The chronic pain group appeared significantly more Suspicious on the BDKH.

Hypothesis 2, that anxiety, depression and hostility would all be elevated in people with classical RA compared with people with the Spondyloarthropathies, was not confirmed by the results. Although disease-related items from the BDI showed patients with RA scored

significantly higher than pain-free controls while patients with SA did not, the two patient groups were not significantly different from each other.

Hypotheses 3 and 4, that current level of pain enhances the levels of anxiety, depression and hostility in subjects, and that self concept moderates the levels of anxiety, depression and hostility, were partially confirmed by the results. Although pain did not enhance anxiety level, it did enhance depression and disease-related depression. Pain also enhanced Guilt but none of the other hostility variables. Various self concepts moderated state and trait anxiety, all types of depression (disease-related depression and depression that included and excluded disease- related items) and hostility.

Anxiety.

In the present study only patients with SA were significantly more anxious than pain-free controls, although the three patient groups were not significantly different.

As the SA group is younger (mean age = 34.5), they have not had their disease as late in life as the other two groups and could be more worried about the future. Alternatively, it could be that patients with SA tend to be more anxious as a group.

The relationship between anxiety, depression and pain varies over

time. Patients with chronic pain are typically described as depressed whereas those with acute pain are typically described as anxious (Ghia, 1981). Further, Pilling, Brannick and Swenson (1967) concluded from their results that as pain persists over time, anxiety appears to give way to depression. From the regression analyses it is apparent that state anxiety is a function of age but trait anxiety is not. The sex of respondents, the length of time they have been ill, their diagnosis (group membership), and pain did not predict state or trait anxiety. It could be concluded that as people get older, they are less anxious about their disease (state anxiety), but over time the amount of trait anxiety they experience does not change very much. This is in accord with the concepts of state and trait anxiety. The present results are in conflict with Pilling et.al. and Ghia because length of illness was not predictive of anxiety while age was. However, Pilling who arbitrarily divided patients into groups of those aged over and under 60, may have confused the effects of age with the effects of length of illness. In contrast, the acute group identified by Ghia had been in pain for less than a month, whilst none of the patients in the present study had been ill for so brief a period. As the average length of illness for the three groups was between 12 and 15 years, many patients may have gone past the point of anxiety to depression, as suggested by Pilling et.al. (1967), explaining the lack of significant difference between the three patient groups in amount of anxiety experienced.

The self concepts were more relevant in predicting state and trait anxiety. Insecure-Secure and Fast-Slow were significant in predicting state anxiety, while Valuable-Worthless and Delicate- Rugged were significant in predicting trait anxiety. Although feeling insecure and

worthless are less obviously a result of a disabling disease such as arthritis, than feeling slow and delicate, the self concepts Insecure and Worthless were more significant in predicting state and trait anxiety, and accounted for more of the variance in the regression equations in predicting anxiety. Delicateness may be seen to be a direct result of disease function. Further, once disease-related questions were removed, delicateness was no longer relevant in predicting anxiety. The relationship between self concept and anxiety exists, but whether anxiety affects self concept or self concept affects the amount of anxiety experienced is unclear.

Depression.

It could be said that there are two aspects of depression assessed by the BDI. The disease-related items identified assess vegetative functioning, whilst the remaining questions relate more to anhedonia and poor self image. Within the present context the latter may be considered to be a more valid measure of depression, while the former assess incapacity which may also be attributed to disease. Hypothesis 2, that patients with RA would be more depressed than patients with SA was not confirmed, although both groups were significantly more depressed than controls. When disease- related questions were considered, patients with RA were significantly more depressed whereas patients with SA were not when compared with controls. The increased incidence of depressive reaction in patients with RA compared to those with other painful locomotor disorders discovered by Zaphiropoulos and Burry (1974), has been attributed by those authors to the systemic nature of rheumatoid disease, the greater persistence of pain and

disability, or constant uncertainty about what the future might hold. The lack of confirmation of Zaphiropoulos and Burry's findings suggests that pain, which did not differ among the patient groups in the present study, and disability (which was not assessed) may contribute more to depression than the systemic nature of rheumatoid disease.

Patients with OA were no more significantly depressed than controls, once disease-related questions were removed from the BDI. In other words they were no different from controls on the anhedonia part of the scale. The data in Table 3 show that people with RA and OA were significantly more depressed than controls on disease-related questions of the BDI.

Data from the regression analyses showed that the age of respondents was only significant in predicting disease-related depression. It has been found that the elderly tend to become fatigued more quickly than do younger people. In old age, the proportion of people with hypochondriacal complaints increases and sexual activity is engaged in less frequently by both men and women. Increased incidences of illness (psychological or physical) function to limit (temporarily or permanently) the amount of sexual activity engaged in during old age (McKenzie, 1980). Also, spontaneous interruption of sleep increases with age, and the amount of time spent awake in bed increases after the fourth decade (Kimmel, 1974). The BDI disease-related items which showed differences between groups concern these areas of functioning (Table 4), hence they may be considered age-related as well as

disease-related.

In the present study, the chronic pain group (OA) were more affected by disease process and showed themselves to be suffering from the vegetative aspects of depression rather than the anhedonia aspects (Table 3). In contrast on an item analyisis of the MMPI, Watson (1982) found that pain patients revealed a considerable amount of depressive symptomatology including vegetative symptoms such as sleep disturbance, as well as symptoms of the anhedonia category, such as poor self-esteem, apathy, feelings of unhappiness, anxiety and dissatisfaction. A comparison of a pain and a medical group showed significant differences on questions of pain complaints and a more general denial of good health amongst the pain group. A picture of anhedonia, low morale, lack of energy and poor self-esteem which is associated with difficulties in sleeping and somatic complaints presented a consistent pattern of depressive symptomatology. Watson's speculation that this condition did not reflect a depressive personality style, but was instead a reaction to the patient's debilitation from their pain, is however in accord with the present findings. This has important implications here concerning the over-diagnosis of depression. From Table 5 it can be seen that removing disease-related questions from the BDI would result in the diagnosis of mild depression for eight people and moderate depression for two. Using all of the BDI questions, by comparison, gives nine cases of mild depression and six cases of moderate. In clinical settings over-diagnosis of depression in patients with RA or in pain is a possibility, because of the inclusion of disease-related items in psychological inventories such as the BDI.

Regression analyses confirmed that depression was a function of pain and self concept in the present study. Length of illness was significant in predicting depression unrelated to disease. The longer people had their disease the more likely they were to be affected by the anhedonia aspects of depression, which is related to a negative self image and sense of hopelessness. Pain (PPI) was also significant in predicting depression and disease-related depression. Once disease-related questions were removed from the BDI, pain was no longer selected in predicting depression. This is in accord with Ghia (1981) where patients with chronic pain were typically described as depressed.

The lack of a relationship between pain and the anhedonia items of the BDI is interesting as it suggests that the emotional component of depression which often accompanies chronic painful disorders may be more a function of other aspects of an individual's functioning than pain. In the present study the length of time an individual had had the disorder, and the self concepts of dullness and fairness provided an indication of the other aspects which were related to the anhedonia, hopelessness and lack of self worth assessed by this part of the BDI. Increasing dullness can be seen to be related to a sense of low self worth which is associated with depression. The relationship between fairness and depression unrelated to disease is, however, an unexpected result.

The more delicate people saw themselves, the more depressed they were likely to be on all of the BDI questions. The more weak people saw themselves, the more depressed they were likely to be on disease-related questions of the BDI. Both concepts can be seen to be

a description of physical functioning which would be affected by a chronic painful disorder.

A variant of major depression proposed by Blumer and Heibronn (1982) was the category of Pain-Prone Disorder. They noted that while pain-prone patients shared many associated features with patients who had depression, such as anhedonia and insomnia, the notion that pain patients have the personality characteristics associated with severe depression was not supported. Williams and Spitzer (1982) found two difficulties with this argument. Symptoms such as anhedonia are not diagnostically specific to depression, and anhedonia was present in only 58% of Blumer and Heilbronn's pain patients. Further, Williams and Spitzer suggested that the comparison group used, patients with RA, may have been an inappropriate control group for studying the clinical features seen in patients with chronic and severe pain. As all of the 36 patients with RA were receiving gold therapy, a remission inducing drug, it was likely that many of those patients were currently in some stage of remission, explaining the fact that over one half of them reported episodic rather than continuous pain. This may have explained the differences between the two groups in the extent to which the pain affected sex life, enjoyment of leisure time, and the ability to pursue pre-illness hobbies, and was associated with depressed mood. In contrast to Blumer and Heilbronn's view of pain as a variant of depressive disease, Swanson (1984) suggested that pain was a third pathological emotion distinct from anxiety and depression, but more closely related to depression. In the present study, membership of the pain group (OA) was not predictive of depression. This may have been because this group differed in characteristics from a group of

"pain-prone" patients. Amongst the present patient groups however, the amount of reported pain (PPI) was predictive of depression when the vegetative aspects of depression were used as, or included in the dependent variable. In the present study, inconsistencies in results could have been due to unanalyzed demographic information such as the marital status, type of medications used by respondents, and degree of disability.

Hostility

Of all the hostility variables, only Suspicion showed a significant difference between groups, where the pain group (OA) was significantly more Suspicious than the control group. On all other variables, no groups were significantly more hostile. Hypothesis 2, that Hostility would be elevated in people with classical RA compared with people with SA was not confirmed. This is in contrast to previous research (Kasl and Cobb, 1969)

Age, sex and various self concepts were found to moderate all of the hostility variables (Table 9). Age moderated Assault, Indirect Hostility and Motor Hostility. Sex moderated Assault, Verbal Hostility and Motor Hostility. Pleasant-Unpleasant moderated Assault; Passive-Active moderated Indirect Hostility; Insecure-Secure moderated Indirect Hostility and Guilt; Fair-Unfair moderated Resentment, Suspicion, Verbal Hostility, Motor, Attitude and Total Hostility; and Dull-Sharp moderated Verbal Hostility. As Crown et. al. (1975) suggested, there is a need for research into overt and covert expression of aggression, and how environmental cues leading to

aggressive behaviour are processed within the nervous system, as well as cognitive factors involved. It could well be that the self concepts patients had of themselves, were a product of their aggressive behaviours, rather than that they were aggressive because of their self concepts.

Summary and Conclusions

Patients with SA were significantly more anxious and all patient groups were significantly more depressed when compared with controls. In general patients were no more hostile when compared with pain- free controls. Pain enhanced depression and Guilt, but not anxiety or any of the other hostility variables. Self concept moderated anxiety,depression and hostility.

State anxiety is a function of age rather than group membership. Depression is a function of pain and self concept, and age is an important factor in disease-related depression. The questions from the BDI may be age and disease-related and result in the over-diagnosis of depression. This has important clinical implications. More research is needed into tests to see that over-diagnosis does not occur. It is important that valid cutoffs are established for aged and pain patients. Overall it seemed that pain and age affected vegetative functioning, perhaps causing some patients to appear more depressed, while the time that they had been in pain affected aspects like self worth, sense of hope and ability to enjoy life (the non disease-related BDI items). Longitudinal research is needed to see the effects of

rheumatoid disease on people from early to later stages in the disease course.

The three arthritic groups studied (RA, OA and SA) were not dissimilar in their reported experiences. Pain and self concept were important aspects of their experience. In referring to self esteem, Elton, Stanley and Burrows (1978) found that the chronic "pain-prone" patient may have personality problems and a very poor self concept. Both the feelings of guilt and the ease of accepting the "sick role", and clinging to it regardless of its apparent disadvantages, suggest a fear of dealing adequately with everyday problems and doubts regarding one's ability to cope with the exigencies of life. Pain could be a way out of facing difficulties, an opportunity to opt out. Pain-prone patients showed a significant reduction in their reported pain experience as a result of psychological treatments and also showed a significant improvement in self- esteem scores. Elton et. al. felt that this confirmed a relationship between "persistent" pain and low self-esteem, and that treatment directed at improvement of self-esteem may produce concomitant improvement in the patient's pain experience. It has been suggested from cognitive theory that symptomatic manifestations of depression are related to the cognitive organization of the depressed patient (Beck, Rush, Shaw and Emery, 1979). The depressed patient may regard himself in a derogatory fashion and look upon his future as being bleak. If patients can be helped to have better self concepts then they are less likely to become depressed as a result of their disabling disease.

There is a need for research into activity levels of patients,

available social supports and stress experiences, in addition to looking at just psychological variables. Whether disease is a causal factor in lowered self concept, or lowered self concept causes increased anxiety, depression and hostility may be debateable. More importantly, there are implications for Hoffman's view that individuals with early rheumatoid disease may require psychological resources in order to contain successfully the disabling effects of the disease. The present study did not look closely at coping skills. This is an area where further research is also needed. If individuals can be helped to achieve a better self concept, they may obtain a successful manner of coping with their disease, rather than succumbing to their disease.

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Appendix 1

Diagnostic Criteria for RA by the American Rheumatism Association.

1. Morning stiffness (one hour or more).
2. Pain on motion or tenderness in at least one joint.
3. Swelling (soft tissue thickening or fluid) in at least one joint continuously for not less than six weeks.
4. Swelling of at least one other joint.
5. Symmetrical joint swelling (bilateral involvement of proximal interphalangeal, metacarpo-phalangeal or metatarsal-phalangeal joints is acceptable without absolute symmetry). (Distal interphalangeal joint involvement will not satisfy this criterion).
6. Subcutaneous nodules (observed by physician) over bony prominences on extensor surfaces or in juxta-articular regions.
7. X-ray changes typical of RA (at least peri-articular bony decalcification).
8. Positive sheep cell agglutination test.
9. Poor mucin precipitate from synovial fluid.
10. Characteristic histologic changes in synovial membrane with three or more of the following:
    - marked villous hypertrophy;
    - proliferation of superficial synovial cells often with palisanding;
    - marked infiltration of chronic inflammatory cells (lymphocytes or plasma cells predominating) with tendency to form "lymphoid nodules";
    - deposition of compact fibrin either on the surface or interstitially;
    - foci of cell necrosis.
11. Characteristic histologic changes in nodules showing granulomatous foci with central zones of cell necrosis surrounded by proliferated fixed cells, and peripheral fibrosis and chronic inflammatory cell infiltration, predominantly perivascular.

Appendix 2

New York Clinical Criteria for Ankylosing Spondylitis
(Bennett and Wood, 1968).

1. Limitation of motion of the lumbar spine in all three planes (anterior flexion, lateral flexion and extension).
2. A history of pain or the presence of pain at the dorsolumbar junction or in the lumbar spine.
3. Limitation of chest expansion to one inch (2.5 cm) or less, measured at the level of the fourth intercostal space.

Definite Ankylosing Spondylitis present if:

1. Grade 3-4 bilateral sacro-iliitis associated with at least one clinical criterion.
2. Grade 3-4 unilateral or Grade 2 bilateral sacro-iliitis associated with clinical criterion 1 or with both clinical criteria 2 and 3.

Probable Ankylosing Spondylitis present if:

Grade 3-4 bilateral sacro-iliitis exists without any clinical criteria.

APPENDIX 3

Letter to experimental groups

LETTER TO PARTICIPANT.

The Department of Psychology at Massey University and the Medical Research Laboratory at Palmerston North Hospital requests your participation in a research project the results of which we hope will be of value to sufferers of Arthritic conditions in the future.

We would ask you to fill in the attached questionnaire which asks your views and feelings on various matters.

As part of the study is to check the suitability of these questions for arthritic sufferers you may find that some of the questions do not relate to an arthritic sufferer or are not relevant to you. We ask you, however, to answer all questions as best you can as they apply to you, so that we have a complete set of results.

All responses will be fully confidential. We will not use any individual data, but only general statistics derived from yours and other's responses. At the end of the research we will make available a survey of our findings. No individual names will be used. Only the medical staff at the medical research laboratory will know who the code number on top of this form applies to. If you wish to obtain a summary of your responses this will be arranged, on request, once the research is completed.

Please return the questionnaire in the envelope provided.

Thank you for your assistance with this important study.

MR B. CRAWFORD)
DR R. WIGLEY)
PROFESSOR G. SHOUKSMITH) RESEARCH TEAM
DR H. SHEPPEARD)
MR M. JOHNSON)

Letter to control group

LETTER TO PARTICIPANT.

The Department of Psychology at Massey University and the Medical Research Laboratory at Palmerston North Hospital requests your participation in a research project the results of which we hope will be of value to sufferers of Arthritic conditions in the future. Your responses will be compared with those of a group of arthritic or chronically ill patients.

We would ask you to fill in the attached questionnaire which asks your views and feelings on various matters.

As part of the study is to check the suitability of these questions for arthritic sufferers you may find that some of the questions are not relevant to you. We ask you, however, to answer all questions as best you can as they apply to you, so that we have a complete set of results.

All responses will be fully confidential. We will not use any individual data, but only general statistics derived from yours and other's responses. At the end of the research we will make available a survey of our findings. If you wish to obtain a summary of your responses this will be arranged, on request, once the research is completed.

Please return the questionnaire in the envelope provided. If you experience chronic pain please do not fill out this questionnaire.

Thank you for your assistance with this important study.

MR B. CRAWFORD)
DR R. WIGLEY)
PROFESSOR G. SHOUKSMITH) RESEARCH TEAM
DR H. SHEPPEARD)
MR M. JOHNSON)

DEMOGRAPHIC DATA

NAME .....

AGE .....

SEX .....

MARITAL STATUS .....

OCCUPATION .....

NO. OF YEARS EDUCATION .....

.....

AGE OF ONSET OF ILLNESS .....

MEDICATION USED

.....

.....

.....

.....

.....

.....

The Beck Depression Inventory

PART A

On this questionnaire are groups of statements. Please read each group of statements carefully. Then pick out the one statement in each group which best describes the way you have been feeling the PAST WEEK, INCLUDING TODAY! Circle the number beside the statement you picked. If several statements in the group seem to apply equally well, circle each one. Be sure to read all the statements in each group before making your choice.

1. 0 I do not feel sad.
   1 I feel sad.
   2 I am sad all the time and I can't snap out of it.
   3 I am so sad or unhappy that I can't stand it.

2. 0 I am not particularly discouraged about the future.
   1 I feel discouraged about the future.
   2 I feel I have nothing to look forward to.
   3 I feel that the future is hopeless and that things cannot improve.

3. 0 I do not feel like a failure.
   1 I feel I have failed more than the average person.
   2 As I look back on my life, all I can see is a lot of failures.
   3 I feel I am a complete failure as a person.

4. 0 I get as much satisfaction out of things as I used to.
   1 I don't enjoy things the way I used to.
   2 I don't get real satisfaction out of anything anymore.
   3 I am dissatisfied or bored with everything.

5. 0 I don't feel particularly guilty.
   1 I feel guilty a good part of the time.
   2 I feel quite guilty most of the time.
   3 I feel guilty all of the time.

6. 0 I don't feel I am being punished.
   1 I feel I may be punished.
   2 I expect to be punished
   3 I feel I am being punished.

7. 0 I don't feel disappointed in myself.
   1 I am disappointed in myself.
   2 I am disgusted with myself.
   3 I hate myself.

8. 0 I don't feel I am any worse than anybody else.
   1 I am critical of myself for my weaknesses or mistakes.
   2 I blame myself all the time for my faults.
   3 I blame myself for everything bad that happens.

9. 0 I don't have any thoughts of killing myself.
   1 I have thoughts of killing myself, but I would not carry them out.
   2 I would like to kill myself.
   3 I would kill myself if I had the chance.

10. 0 I don't cry anymore than usual.
    1 I cry more now than I used to.
    2 I cry all the time now.
    3 I used to be able to cry, but now I can't cry even though I want to.

11. 0 I am no more irritated now than I ever am.
    1 I get annoyed or irritated more easily than I used to.
    2 I feel irritated all the time now.
    3 I don't get irritated at all by the things that used to irritate me.

12. 0 I have not lost interest in other people.
    1 I am less interested in other people than I used to be.
    2 I have lost most of my interest in other people.
    3 I have lost all of my interest in other people.

13. 0 I make decisions about as well as I ever could
    1 I put off making decisions more than I used to.
    2 I have greater difficulty in making decisions than before.
    3 I can't make decisions at all anymore.

14. 0 I don't feel I look any worse than I used to.
    1 I am worried that I am looking old or unattractive.
    2 I feel that there are permanent changes in my appearance that make me look unattractive.
    3 I believe that I look ugly.

15. 0 I can work about as well as before.
    1 It takes an extra effort to get started at doing something.
    2 I have to push myself very hard to do anything.
    3 I can't do any work at all.

16. 0 I can sleep as well as usual.
    1 I don't sleep as well as I used to.
    2 I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.
    3 I wake up several hours earlier than I used to and cannot get back to sleep.

17. 0 I don't get more tired than usual.
    1 I get tired more easily than I used to.
    2 I get tired from doing almost anything.
    3 I am too tired to do anything.

18. 0 My appetite is no worse than usual.
    1 My appetite is not as good as it used to be.
    2 My appetite is much worse now.
    3 I have no appetite at all anymore.

19. 0 I haven't lost much weight, if any lately.
    1 I have lost more than 5 pounds.
    2 I have lost more than 10 pounds.
    3 I have lost more than 15 pounds.

    I am purposely trying to lose weight by eating less.
    Yes _____ No _____

20. 0 I am no more worried about my health than usual.
    1 I am worried about physical problems such as aches and pains; or upset stomach; or constipation.
    2 I am very worried about physical problems and it's hard to think of much else.
    3 I am so worried about my physical problems, that I cannot think about anything else.

21. 0 I have not noticed any recent change in my interest in sex.
    1 I am less interested in sex than I used to be.
    2 I am much less interested in sex now.
    3 I have lost interest in sex completely.

State Trait Anxiety Inventory

PART B

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropiate number 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 comfortable	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

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number 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

Buss-Durkee Hostility Inventory

PART C

Circle true or false depending on how the statement applies to you.

1. I seldom strike back, even if someone hits me first TRUE/FALSE
2. I sometimes spread gossip about people I don't like TRUE/FALSE
3. Unless somebody asks me in a nice way, I won't do what they want TRUE/FALSE
4. I lose my temper easily but get over it quickly TRUE/FALSE
5. I don't seem to get what's coming to me TRUE/FALSE
6. I know that people tend to talk about me behind my back TRUE/FALSE
7. When I disapprove of my friends' behaviour, I let them know it TRUE/FALSE
8. The few times I have cheated, I have suffered unbearable feelings of remorse TRUE/FALSE
9. Once in a while I cannot control my urge to harm others TRUE/FALSE
10. I never get mad enough to throw things TRUE/FALSE
11. Sometimes people bother me just by being around TRUE/FALSE
12. When someone makes a rule I don't like I am tempted to break it TRUE/FALSE
13. Other people always seem to get the breaks TRUE/FALSE
14. I tend to be on my guard with people who are somewhat more friendly than I expected TRUE/FALSE
15. I often find myself disagreeing with people TRUE/FALSE
16. I sometimes have bad thoughts which make me feel ashamed of myself TRUE/FALSE
17. I can think of no good reason for ever hitting anyone TRUE/FALSE
18. When I am angry, I sometimes sulk TRUE/FALSE
19. When someone is bossy, I do the opposite of what he asks TRUE/FALSE
20. I am irritated a great deal more than people are aware of TRUE/FALSE
21. I don't know any people that I downright hate TRUE/FALSE
22. There are a number of people who seem to dislike me very much TRUE/FALSE
23. I can't help getting into arguments when people disagree with me TRUE/FALSE
24. People who shirk on the job must feel very guilty TRUE/FALSE
25. If somebody hits me first, I let him have it TRUE/FALSE
26. When I am mad, I sometimes slam doors TRUE/FALSE

.../2

27.	I am always patient with others	TRUE/FALSE
28.	Occasionally when I am mad at someone I will give him the "silent treatment"	TRUE/FALSE
29.	When I look back on what's happened to me, I can't help feeling mildly resentful	TRUE/FALSE
30.	There are a number of people who seem to be jealous of me	TRUE/FALSE
31.	I demand that people respect my rights	TRUE/FALSE
32.	It depresses me that I did not do more for my parents	TRUE/FALSE
33.	Whoever insults me or my family is asking for a fight	TRUE/FALSE
34.	I never play practical jokes	TRUE/FALSE
35.	It makes my blood boil to have somebody make fun of me	TRUE/FALSE
36.	When people are bossy, I take my time just to show them	TRUE/FALSE
37.	Almost every week I see someone I dislike	TRUE/FALSE
38.	I sometimes have the feeling that others are laughing at me	TRUE/FALSE
39.	Even when my anger is aroused, I don't use "strong language"	TRUE/FALSE
40.	I am concerned about being forgiven for my sins	TRUE/FALSE
41.	People who continually pester you are asking for a punch in the nose	TRUE/FALSE
42.	I sometimes pout when I don't get my own way	TRUE/FALSE
43.	If somebody annoys me, I am apt to tell him what I think of him	TRUE/FALSE
44.	I often feel like a powder keg ready to explode.	TRUE/FALSE
45.	Although I don't show it, I am sometimes eaten up with jealousy	TRUE/FALSE
46.	My motto is "Never trust strangers"	TRUE/FALSE
47.	When people yell at me, I yell back	TRUE/FALSE
48.	I do many things that make me feel remorseful afterward	TRUE/FALSE
49.	When I really lose my temper, I am capable of slapping someone	TRUE/FALSE
50.	Since the age of ten, I have never had a temper tantrum	TRUE/FALSE
51.	When I get mad I say nasty things	TRUE/FALSE

.../3

52.	I sometimes carry a chip on my shoulder	TRUE/FALSE
53.	If I let people see the way I feel, I'd be considered a hard person to get along with	TRUE/FALSE
54.	I commonly wonder what hidden reason another person may have for doing something nice for me	TRUE/FALSE
55.	I could not put someone in his place, even if he needed it	TRUE/FALSE
56.	Failure gives me a feeling of remorse	TRUE/FALSE
57.	I get into fights about as often as the next person	TRUE/FALSE
58.	I can remember being so angry that I picked up the nearest thing and broke it	TRUE/FALSE
59.	I often make threats I don't really mean to carry out	TRUE/FALSE
60.	I can't help being a little rude to people I don't like	TRUE/FALSE
61.	At times I feel I get a raw deal out of life	TRUE/FALSE
62.	I used to think that most people told the truth but now I know otherwise	TRUE/FALSE
63.	I generally cover up my poor opinion of others	TRUE/FALSE
64.	When I do wrong, my conscience punishes me severely	TRUE/FALSE
65.	If I have to resort to physical violence to defend my rights, I will	TRUE/FALSE
66.	If someone doesn't treat me right, I don't let it annoy me	TRUE/FALSE
67.	I have no enemies who really wish to harm me	TRUE/FALSE
68.	When arguing, I tend to raise my voice	TRUE/FALSE
69.	I often feel that I have not lived the right kind of life	TRUE/FALSE
70.	I have known people who pushed me so far that we came to blows	TRUE/FALSE
71.	I don't let a lot of unimportant things irritate me	TRUE/FALSE
72.	I seldom feel that people are trying to anger or insult me	TRUE/FALSE
73.	Lately, I have been kind of grouchy	TRUE/FALSE
74.	I would rather concede a point than get into an argument about it	TRUE/FALSE
75.	I sometimes show my anger by banging on the table	TRUE/FALSE

SELF-CONCEPT

Osgood's Scale

"Myself, as I am"

For each of the following in turn, you are asked to judge how you see yourself; to rate yourself on the scale which is defined by the two descriptive words at the ends. If you feel that one of the words describes you absolutely, then place a tick (✓) in the space alongside that word. If you feel that your nature lies somewhere between the two, place your tick on the appropriate space, between the two extremes, which you feel best describes your position.

1.	VALUABLE	_____:_____:_____:_____:_____:_____:_____	WORTHLESS
2.	FAST	_____:_____:_____:_____:_____:_____:_____	SLOW
3.	STRONG	_____:_____:_____:_____:_____:_____:_____	WEAK
4.	UNCERTAIN	_____:_____:_____:_____:_____:_____:_____	DEFINITE
5.	DULL	_____:_____:_____:_____:_____:_____:_____	SHARP
6.	PLEASANT	_____:_____:_____:_____:_____:_____:_____	UNPLEASANT
7.	INSECURE	_____:_____:_____:_____:_____:_____:_____	SECURE
8.	GOOD	_____:_____:_____:_____:_____:_____:_____	BAD
9.	COLD	_____:_____:_____:_____:_____:_____:_____	HOT
10.	DELICATE	_____:_____:_____:_____:_____:_____:_____	RUGGED
11.	PASSIVE	_____:_____:_____:_____:_____:_____:_____	ACTIVE
12.	FAIR	_____:_____:_____:_____:_____:_____:_____	UNFAIR

McGill Pain Questionnaire.

What does Your Pain Feel Like?

Some of the words below may describe your pain at present. Circle any words that describe your pain now but use only one word from each box. Leave any boxes where the words don't apply to your pain.

1	2	3	4
Flickering	Jumping	Pricking	Sharp
Quivering	Flashing	Boring	Cutting
Pulsing	Shooting	Drilling	Lacerating
Throbbing		Stabbing	
Beating		Lancinating	
Pounding			

5	6	7	8
Pinching	Tugging	Hot	Tingling
Pressing	Pulling	Burning	Itchy
Gnawing	Wrenching	Scalding	Smarting
Cramping		Searing	Stinging
Crushing			

9	10	11	12
Dull	Tender	Tiring	Sickening
Sore	Taut	Exhausting	Suffocating
Hurting	Rasping		
Aching	Splitting		
Heavy			

13	14	15	16
Fearful	Punishing	Wretched	Annoying
Frightful	Gruelling	Blinding	Troublesome
Terrifying	Cruel		Miserable
	Vicious		Intense
	Killing		Unbearable

17	18	19	20
Spreading	Tight	Cool	Nagging
Radiating	Numb	Cold	Nauseating
Penetrating	Drawing	Freezing	Agonizing
Piercing	Squeezing		Dreadful
	Tearing		Torturing

Check that you have not circled more than one word in each box and have left any boxes where the words don't apply.

How Does Your Pain Change With Time?

1. Circle the word or words you would use to describe the pattern of your pain?

1	2	3
Continuous	Rhythmic	Brief
Steady	Periodic	Momentary
Constant	Intermittent	Transient

2. What kind of things relieve your pain?

3. What kind of things increase your pain?

How Strong is Your Pain?

People agree that the following 5 words represent pain of increasing intensity. They are:

1	2	3	4	5
Mild	Discomforting	Distressing	Horrible	Excruciating

To answer each question below, write the number of the most appropriate word in the space beside the question.

1. Which word describes your pain right now? _____
2. Which word describes it at its worst? _____
3. Which word describes it when it is least? _____
4. Which word describes the worst toothache you ever had? _____
5. Which word describes the worst headache you ever had? _____
6. Which word describes the worst stomach-ache you ever had? _____

Means and Standard Deviations for Measures obtained from the Questionnaire for Control and Patient Groups

Measure	Control		Group 2		Group 3		Group 4	
	M	SD	M	SD	M	SD	M	SD
Length of illness	-	-	12.200	8.504	13.267	13.921	14.267	10.813
State Anxiety	28.350	6.714	33.867	9.418	35.357	10.270	38.067	10.082
Trait Anxiety	32.450	7.045	37.067	7.686	39.286	11.828	41.133	8.114
State (dis)	5.350	2.033	6.667	1.839	6.857	2.214	7.267	2.375
Trait (dis)	4.450	1.234	5.533	1.408	5.429	1.505	5.400	1.298
State (net)	23.000	5.047	27.200	7.702	26.600	10.914	30.800	8.529
Trait (net)	28.000	6.258	31.533	7.009	31.600	13.855	35.733	7.469
BDI (all)	2.300	3.294	9.333	5.273	7.571	4.735	8.000	4.440
BDI (disease-Rel)	1.200	1.735	4.733	2.404	4.429	3.180	3.267	1.668
BDI (net)	1.100	1.971	4.600	3.355	2.933	2.120	4.733	3.615
Assault	3.500	2.236	2.533	1.846	3.333	2.845	3.800	2.396
Indirect Hostility	3.800	1.673	3.133	1.959	3.267	2.604	4.200	2.145
Irritability	4.750	2.221	5.200	2.624	5.467	2.167	6.400	3.112
Negativism	2.250	1.410	1.800	1.424	2.667	1.397	2.200	0.941
Resentment	1.650	1.755	1.600	1.183	2.800	2.426	1.933	1.831
Suspicion	2.100	1.889	2.333	2.059	4.133	2.264	2.333	1.676
Verbal Hostility	6.200	2.262	6.200	3.385	5.667	3.374	6.467	2.615
Guilt	3.250	1.832	4.000	2.070	4.333	2.257	4.000	1.852
Motor Hostility	18.250	5.408	17.067	7.732	17.733	8.924	20.867	8.847
Attitude Hostility	3.750	3.432	3.933	2.865	6.933	4.200	4.267	3.240
Total Hostility	27.500	9.220	26.800	9.541	31.667	13.730	31.333	12.653
Valuable-Worthless	2.200	1.361	2.500	1.160	2.733	1.486	2.667	1.234
Fast-Slow	2.650	0.875	4.600	1.549	3.800	1.612	4.133	1.506
Strong-Weak	2.550	0.887	3.867	1.727	2.800	1.320	3.533	1.552
Uncertain-Certain	4.895	1.449	4.800	1.521	5.400	1.352	4.600	1.502
Dull-Sharp	5.263	1.447	4.467	1.506	5.133	1.187	4.800	1.612
Pleasant-Unpleast.	1.800	1.005	2.467	1.187	2.333	1.345	2.933	1.486
Insecure-Unsecure	5.750	1.410	5.429	1.785	5.533	1.552	5.133	1.506
Good-Bad	1.800	0.951	2.467	1.187	2.133	1.302	2.667	1.234
Cold-Hot	4.950	1.234	4.267	1.223	4.571	1.089	4.733	0.884
Delicate-Rugged	4.250	1.293	4.500	1.743	4.867	1.356	4.533	1.060
Passive-Active	5.300	1.342	4.400	1.242	4.533	1.959	4.600	1.844
Fair-Unfair	1.900	0.912	2.067	1.280	1.867	1.060	2.333	1.496
Sensory	-	-	7.000	4.986	10.933	6.912	10.733	6.984
Affective	-	-	1.733	2.463	1.600	1.805	1.667	1.718
Evaluative	-	-	1.600	1.183	1.933	1.387	1.400	1.056
Total Pain	-	-	10.333	6.831	14.467	8.105	13.800	8.343
Miscellaneous	-	-	1.600	2.324	2.533	2.295	3.067	2.187
No. Words Chosen	-	-	5.867	3.833	7.333	3.177	7.800	5.130
Present Pain I(PPI)	-	-	1.467	0.516	1.800	0.941	2.067	0.961

State (dis) = State Anxiety Disease-related questions
Trait (dis) = Trait Anxiety Disease-related questions
State (net) = State Anxiety with Disease-related questions removed
Trait (net) = Trait Anxiety with Disease-related questions removed
BDI (net) = BDI with Disease-related questions removed