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CHRONIC PAIN, ALEXITHYMIA, AND OBJECT RELATIONS

A Dissertation

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Doctor of Philosophy

Degree

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Elizabeth West Krause

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ABSTRACT

In the treatment of chronic neck and back pain patients, the influence of early life experiences, or object relations, and the inability to verbalize feelings, or alexithymia, have not been explored. This study investigated the object relations and presence of alexithymia in chronic pain patients in comparison to a sample of non-pain workers. In addition, a comparison was made of the level of object relations and presence of alexithymia in chronic pain patients who returned to work versus chronic pain patients who did not return to work at six months following a prototypical work-hardening program.

One hundred patients diagnosed with chronic pain following a neck or back injury and one hundred non-injured individuals in similar job categories completed the Toronto Alexithymia Scale (TAS) and the Bell Object Relations Inventory (BORI). Discriminant analysis was used to test two hypotheses:

(a) Neither Object Relations scores as measured by the BORI four scales of Alienation, Insecure Attachment, Egocentricity, and Social Incompetence, nor Alexithymia as measured by the TAS differentiate chronic pain patients from non-pain individuals. (b) Neither Object Relations scores as measured by the BORI four scales of Alienation, Insecure Attachment, Egocentricity, and Social

Incompetence, nor Alexithymia as measured by the TAS predict whether chronic pain patients return to work at six months following treatment for chronic pain.

Results of the discriminant analyses indicated that all five of the predictor variables were significant ($<.05$) in classifying individuals as being members of the chronic pain or non-injured group (at the rate of 86%) and in classifying chronic pain patients who return to work versus chronic pain patients who do not (at the rate of 92%). In comparing individuals with and without chronic pain, alexithymia had the highest correlation to chronic pain patients, followed by alienation, insecure attachment, egocentricity, and social incompetence. In comparing chronic pain patients who returned to work or not, alienation was the variable with the highest correlation, followed by alexithymia, egocentricity, insecure attachment, and social incompetence.

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CHAPTER I

INTRODUCTION

Introduction to the Problem

Blumer and Heilbronn (1982) and Swanson (1978) have stated that we need to know more about how early life experiences, or object relations, contribute to the presence of and ultimate recovery from chronic pain syndrome in adults. Blumer and Heilbronn (1982) have also suggested that we need to know more about how adverse early life experiences affect the presence of alexithymia, or the inability to express feelings in adults with chronic pain. Therefore, the present study was directed toward understanding if object relations and alexithymia differ for (a) chronic pain patients and non-pain individuals and (b) chronic pain patients who recover from an injury and return to work, and, chronic pain patients who do not return to work following an injury.

Introduction to the Study

Chronic Pain Syndrome (CPS), or persistent pain of at least 6 months duration, affects one-third to one-half of the United States population (Chapman & Bonica, 1985). Individuals suffering from chronic pain are principally diagnosed with low back pain, are unaffected by traditional medical treatment, and are unable to return to the work force. Because these individuals are injured on

the job, they are a significant and costly subgroup of the labor force and the longer their pain persists, the chance of returning to work decreases dramatically (Beals & Hickman, 1972).

Turk (1990) cited that during the 20-year period from 1957 to 1976, social security disability benefits increased by 300%, with disability for back pain increasing alone by 2700% (Turk, 1990). Chronic pain has been identified as a national problem by researchers from many disciplines (Hanson & Gerber, 1990). The statistics for chronic pain sufferers range from 240 million lost work days to 4 billion lost work days for pain conditions (Chapman & Bonica, 1985; Osterweis et al, 1987).

The Nuprin Pain Report (Taylor & Curran, 1985) studied pain conditions in the United States. Chronic muscle pain was present in 1 of 10 people, and other types of chronic pain were found to affect 1 of 20 individuals. (Hanson & Gerber, 1990). These numbers translate into missed days at work, increased disability payments, and increased Worker's Compensation claims. Edwards, (1983) indicates that 20-30% of all Worker's Compensation benefits are accounted for by back injuries. With statistics this staggering, the efficacious treatment of chronic pain is quite important.

In general, the chronic pain research indicates that

chronic pain syndromes are characterized by physiological as well as psychological findings, i.e. "pain behaviors" of inactivity, drug misuse, and learned helplessness (Brena, 1979). In reviewing chronic low-back pain claims, Carron (1982) outlined three striking features of the patients: 78.7% of the subjective complaints were not supported by physical findings; 60% were taking dependency inducing drugs; and 49.3% had a previous back injury.

The evaluation of the relationships between pain, personality, and pain behavior is extremely difficult (Diamond and Coniam, 1991). Evaluation is complicated even further by factors exogenous to the patient. For example, the patient may be involved in litigation for disability or personal injury compensation which makes it hard to assess accurately how motivated the patient may be to get well. Disability compensation may well function as a negative incentive when one considers that only 2% of disability beneficiaries ever return to the workforce (Kinney & Brin, 1992).

It is difficult to assess whether pain behaviors result from a personality trait of an individual or from an unconscious attempt to express suffering. Diamond and Coniam (1992) hypothesize that the expression of suffering may be a way to achieve secondary gain. The expression of suffering, disability, and the adoption of the "sick role" can be used to obtain further unwarranted medical

attention, to achieve emotional control over other members of the family and thus gain love and attention that may be otherwise denied. Further, overt pain behaviors can serve to avoid or excuse unpleasant aspects of the patient's life (such as an inability to cope with employment, domestic stress, or emotional and sexual relationships), or to vent the anger and frustration of continued disability (Diamond and Coniam, 1991).

Strang (1985) discusses the "chronic disability syndrome". Here, patients who are capable of returning to the workforce, choose to remain disabled. These patients lack motivation to recover from chronic pain and to return to a productive life. Strang (1985) reports that the disability is often the result of a minor injury but that the disability represents a major inability to cope with other life problems. It is the personality of these chronic pain patients, the patients who do not return to the workforce, that are examined in this study.

It may appear that there is little incentive to try to be rehabilitated after being found disabled. Seres et al (1983) notes that 5% to 15% of injured workers have prolonged or permanent disability. The remaining 80% to 90% of workers with on-the-job injuries return to work within days or weeks of the injury. The psychological profiles of these workers who remain disabled suggests

there are some dynamics at work which affect, or possibly predispose certain individuals to sustain an injury and maintain chronic pain symptoms.

Rationale for This Study

The characteristics of chronic pain patients that differentiate them from other groups of patients and that influence their return to the workforce have been noted by many researchers (Arnoff & McAlary, 1992; Keller & Butcher, 1991; Hansen & Gerber, 1990). In reviewing the majority of research on chronic pain patients, characterological descriptions include hypochondriasis, hysterical personality style, alexithymia, and depression and anxiety syndromes (Keller & Butcher, 1991).

The average chronic pain patient has been described as a high-school-educated Caucasian Protestant in a blue-collar, physically demanding job. Research also shows that chronic pain patients are typically injured on the job and receive monetary compensation while recovering. The chronic pain patient may also have started in the work force early in life, assuming the role of caretaker, which some researchers describe as having unmet dependency needs (Keller & Butcher, 1991; Hansen & Gerber, 1990; Blumer & Heilbronn, 1982).

Following is a list of descriptors, or characteristics of injured workers most likely to return to work (Arnoff & McAlary, 1992).

- Age 18-50
- Education Level: High school graduate or greater
- Out of work less than 6 months
- Positive treatment course (includes high motivation, effective pain mastery, successful stress reduction, improvement in mood)
- Positive work history (includes job available, incentive to return to work)
- No primary/secondary/tertiary gain factors
- No litigation pending

Absent from this list are the intra-individual personality dynamics at play in affecting return to work outcome.

Developing a list of characteristics indicating which patients are most likely to return to work following treatment in a pain center is only a small step toward understanding the multiplicity of issues involved in the chronic pain patient's success or failure in returning to a productive life. Part of understanding what affects the chronic pain patient's success or failure in treatment is looking at intra-individual variables. It is not enough to be able to make a list of characteristics affecting success, if one is not able to understand the dynamics involved for the patient, clinician, health care insurer, and employer. Thus, looking at why chronic pain patients

differ psychologically from non-pain individuals is one step toward understanding and treating the chronic pain patient.

A second issue that needs addressing in the chronic pain literature is how intra-individual variables affect a chronic pain patient's ability to recover from an injury and return to the workforce. Because a subset of patients who suffer from chronic pain never get well, understanding the personality factors influencing recovery is an important aspect in identifying patients who may not respond well to a traditional pain management program (Keller & Butcher, 1991).

Current treatment approaches for chronic pain are primarily cognitive-behavioral in orientation and include pharmacological, physical treatments, and often ignore the psychological factors that play a role in the patient's recovery (Keller & Butcher, 1991). Failure to respond to treatment provided by pain centers is often attributed to noncompliance with treatment or to an inability to modify environmental reinforcement systems such as disability compensation, pathological family systems, or physicians who encourage a continued search for medical/surgical solutions (Hansen & Gerber, 1990).

Hansen and Gerber (1990) hypothesize that failure to respond to treatment is more likely attributed to pain not being the primary problem but instead is symptomatic of

some other more fundamental psychological problem. If such is the case, treatment needs will be different for patients whose primary problem is something other than physical pain.

Fundamental differences in early relationships, or object relations, has been noted by practitioners working with chronic pain patients. In looking at fundamental psychological differences in pain patients, Blumer (1982) suggests that rather than experiencing a painful affect, chronic pain patients try to escape and avoid emotional pain, hard work, and excessive activity. Many chronic pain patients suffered emotionally traumatic childhoods and grew up with a family member who was severely ill, or even disabled (Swanson et al, 1978; Blumer, 1983). Chronic low-back pain patients were also found to have in common a history of working long hours for many years without ever taking a vacation prior to their pain problems (Gentry et al, 1974).

Alexithymia, or the inability to express feelings, has been found to be a characteristic of psychosomatic patients in general (Sifnoes, 1973), and more recently has been linked to chronic pain patients (Julkunen, 1988; Chaturvedi, 1988; Catchlove, 1987). The inability to recognize emotions is thought to be a function of actively trying to suppress or deny emotional pain relating to adverse earlier life experiences (Blumer, 1982). Although

not researched, it seems possible that object relations and alexithymia may influence chronic pain patients response to an injury. Moreover, object relations and alexithymia may affect the perception of stress, i.e., what it means to be injured, and thus affect the way an individual deals with recovery. By examining the object relations personality structure and the presence of alexithymia in pain patients, a clearer understanding of some of the dynamics behind chronic pain patients and their ultimate success or failure in treatment may be gained.

Purpose of This Study

Chronic pain practitioners suggest that early life experiences are different for chronic pain sufferers than for non-pain people, although object relations have not been specifically researched in pain and non-pain groups (Blumer, 1982; Hanson & Gerber, 1990). Chronic pain researchers have linked alexithymia with chronic pain patients, but not as a function of early life experiences, or treatment success or failure in returning to work (Sifnoes, 1973; Catchlove, 1987).

In general, absent from the research on chronic pain is a framework for understanding the individual personality dynamics at play in (a) differentiating chronic pain patients from non-pain individuals, and (b) differentiating chronic pain patients who return to the

workforce following an injury from chronic pain patients who do not return to the workforce following an injury. The purpose of this study is to bridge this gap in the chronic pain literature by examining the relationship between object relations and alexithymia in differentiating chronic pain and non-pain individuals. Also, this study will investigate the relationship between object relations and alexithymia in a patient's recovery from chronic pain and ability to return to the workforce.

By identifying the object relations and presence of alexithymia in pain patients versus non-pain patients, and by comparing pain patients who are successful in traditional treatment and comparing them to pain patients who are unsuccessful in traditional treatment, treatment approaches may be altered to better suit the needs of different patients. Furthermore, by assessing the factors which might contribute to a patient's recovery, costs of treatment may be potentially reduced and clinicians might better be able to accurately predict who might benefit from treatment. Finally, describing the differences among pain patients would identify commonalities among groups of sufferers who might respond best to different treatment emphases (Keller & Butcher, 1991).

Theoretical Basis for This Study

Because all pain patients exhibit behavioral consequences of their pain, treatment approaches have focused on the treatment of overt pain behaviors and cognitions (Aronoff & Rutrick, 1992). Because treatment programs are typically behavioral in emphasis, other non-behavioral factors present in the pain profile may not be treated. The role of personality factors in the chronic pain picture has also been well accepted and can be viewed not only from a behavioral perspective, but from a psychodynamic perspective as well. This study investigated chronic pain from psychodynamic and object relations theory, in an effort to understand more about the non-behavioral and often untreated aspects of chronic pain.

From a psychodynamic theory, chronic pain can sometimes reflect traumatic events experienced earlier in life. When painful emotional experiences are inhibited and repressed, somatic expression of pain can occur. The prevalence of significant problems during childhood among those with chronic pain has been noted by many researchers (Adler, Zlot, Hurny, & Minder, 1989; Blumer & Heilbronn, 1982; Engel, 1959; Violon, 1982).

This view does not suggest that these earlier experiences directly caused chronic-pain syndrome. Certain childhood experiences or other traumatic life

events may, however, predispose a person to develop a chronic-pain syndrome if those experiences are not integrated on an emotional level (Hansen & Gerber, 1990). Miller (1984) notes "it is not the trauma itself that is the source of illness but the unconscious, repressed, hopeless despair over not being allowed to give expression to what one has suffered and the fact that one is not allowed to show and unable to experience feelings of rage, anger, humiliation, despair, helplessness, and sadness" (Miller, 1984, p.259).

According to psychodynamic theory, the need to be dependent on someone else can be fulfilled (unconsciously gratified) by pain and disability. By experiencing pain and disability, the chronic pain patient can be dependent in an acceptable manner (Engel, 1959). Muscle tension can also serve an intrapsychic need against the emergence of feelings and may appear in situations when the individual feels the need to suppress emotions (Bernstein, 1978).

Object relations theory focuses on how a person perceives and responds to interpersonal relationships (Guntrip, 1960). Furthermore, object relations theory focuses on how the perceptions of relationships are represented intrapsychically. Object relations are considered a basic component of personality structure, and as such, lead to the formation of an identity based on early interactions (Klein, 1975; Mahler, 1975). By

looking at the object relations of chronic pain patients, practitioners may be better able to help people adjust to the idea of having chronic pain, comply with treatment, adjust psychosocially, and learn to cope with stress.

Research Questions

This study investigated the object relations and presence of alexithymia in chronic pain patients in comparison to a sample of non-pain workers. In addition, a comparison was made of the level of object relations and presence of alexithymia in chronic pain patients who return to work versus chronic pain patients who do not return to work at six months following a prototypical work-hardening program. The research questions are:

1. Do object relations or alexithymia differentiate patients diagnosed with chronic pain from non-pain individuals?

2. Do object relations or alexithymia predict whether chronic pain subjects return to work at six months following treatment for chronic pain?

Research Hypotheses

This study explored the object relations of chronic pain patients who return to work, chronic pain patients who do not return to work, and non-chronic pain subjects. In addition, this study investigated alexithymia in both groups of chronic pain patients (those who return to work,

versus those who do not return to work) and the group of non-pain patients.

The null hypotheses are:

Ho₁: Neither Object Relations scores as measured by the Bell Object Relations Inventory (BORI) four scales of Alienation, Insecure Attachment, Egocentricity, and Social Incompetence, nor Alexithymia as measured by the Toronto Alexithymia Scale (TAS) differentiate chronic pain patients from non-pain individuals.

Ho₂: Neither Object Relations scores as measured by the BORI four scales of Alienation, Insecure Attachment, Egocentricity, and Social Incompetence, nor Alexithymia as measured by the TAS predict whether chronic pain patients return to work at six months following treatment for chronic pain.

Definition of Terms

Following is a list of terms used in this study. Each term will be defined as it is used in this study.

Alexithymia- Alexithymia refers to the inability to express feelings verbally (Sifneos, 1973).

Bell Object Relations Inventory (BORI)- The Bell Object Relations Inventory was developed to measure the quality of interpersonal relationships. It has four subscales which were factor analytically derived: Alienation, Insecure Attachment, Egocentricity, and Social Incompetence. (Bell, Bellington, and Becker, 1985).

Following is a description of each subscale.

Alienation (Aln)- Alienation is best described as a basic lack of trust in relationships (Kernberg, 1975). In this study, it is thought that pain patients may have an internal experience of themselves as victimized and abused by their injury which would affect their recovery from pain.

Insecure Attachment (IA)- Insecure Attachments are defined as painful interpersonal relationships (Billington & Bell, 1985). Here, it is thought that if pain patients formed insecure attachments and were sensitive to rejection, this may affect their relationships with their employers and physicians and their ultimate recovery from pain.

Egocentricity (Ego)- Egocentricity is associated with attitudes of exploitation (Billington & Bell, 1985). It is hypothesized that chronic pain patients may have a view of the world that others are out to humiliate and defeat them, which would adversely affect their ability to trust staff and physicians involved in their treatment.

Social Incompetence (SI)- The Social Incompetence scale looks at nervous interactions with the opposite sex (Billington & Bell, 1985). In this study, it is thought that unsatisfactory intimate relationships may affect the internal experience of pain.

Chronic Pain- Chronic pain is defined as pain that persists past the expected time of healing, or has been present for more than 3 months (Rogers, 1993). In this study the chronic pain patients have all been diagnosed by a medical physician as having chronic pain, and most chronic pain subjects were diagnosed as having myofascial pain syndrome. All patients in this study sustained an injury involving one or both of the upper extremities, the neck, the shoulders, or the back. Chronic pain conditions not included in this study are chronic temporal mandibular joint syndrome, chronic headaches, reflex sympathetic dystrophy, cancer, or rheumatoid arthritis.

Pain Treatment- In this study, the chronic pain patients are referred to a free-standing outpatient center which patients attend on a daily basis. The patients are involved with a multidisciplinary team which includes doctors, psychologists, physical and occupational therapists.

Object Relations- Object relations theory focuses on relations with others, which may be represented by real others or by internal representations of others (Fairbairn, 1952). Relationships with others, and internal experiences of relationships are thought to be a function of the most fundamental early relationship with parents (Guntrip, 1960). In this study, object relations are investigated in two ways. First, the object relations

of non-pain subjects are compared to chronic pain subjects. Second, the object relations of chronic pain subjects who return to work are compared to chronic pain subjects who do not return to work following an injury and pain treatment. It is hypothesized that people who have chronic pain have different, less stable early relationships with their parents, and subsequently, as adults have an internal experience of pain which affects their eventual recovery.

Toronto Alexithymia Scale (TAS)- The Toronto Alexithymia Scale is used to measure the degree of alexithymia through a 26 item self report questionnaire (Taylor, Ryan, & Bagby, 1985). Each item on this scale is on a 1 to 5 likert scale. In this study, the cutoff score of 74 or greater is used to define someone as alexithymic.

Work Hardening- This is the component of pain treatment which involves muscle strengthening, aerobic conditioning, and job re-conditioning.

A review of the literature is presented in Chapter II and includes the relevant research in the following areas: Chronic Pain, Object Relations, and Alexithymia.

CHAPTER II

LITERATURE REVIEW

Chronic Pain

In Chapter I, the background for the study of object relations, alexithymia and chronic pain was presented. In Chapter II, a review of the literature follows. The first section, Chronic Pain, is divided into four sections: (a) Chronic Pain Syndromes and Diagnosis, (b) Psychological Profile of Chronic Pain, (c) Chronic Pain Measurement, and (d) Chronic Pain Management.

Chronic Pain Syndromes and Diagnosis

It is important to distinguish the difference between acute pain and chronic pain. Acute pain typically follows a natural recovery course consistent with what caused the pain (Hoffert, 1992). An example of acute pain would be pain following surgery. Acute pain is associated with physiological changes, called nociception. Examples of these nociceptive changes are elevated blood pressure, increased pulse rate, sweating, and decreased response to other stimuli. Chronic pain is importantly different than acute pain. Chronic pain typically outlasts the expected recovery period following an injury (Hoffert, 1992). Unlike acute pain, chronic pain is not associated with nociception, or the physical changes listed above. On the contrary, the chronic pain patient may appear more comfortable than their verbal descriptions of the pain

they are in. The term chronic pain syndrome (CPS) is used when there is an excessive loss of normal functioning associated with chronic pain (Hoffert, 1992).

Chronic pain is defined as pain that persists past the time of healing, or has been present for more than 3 months (Rogers, 1993). Turk (1990), considers the longitudinal perspective of chronic pain to underscore the complexity of chronic pain. Because the nature of chronic pain by definition persists over time, it impacts many areas of functioning-i.e. relationships, economic, social, as well as physical functioning. The physical contributors (nociceptive sensory stimuli) to pain perception may have influenced the initial perceptual experience, but because they exist over time, these factors become influenced by cognitions, affects, the environmental response, and the patient's overall personality (Turk, 1990).

Pain is perceived from the dorsal horn and is transmitted in the dorsal column via the medial lemniscus to the thalamus and then to the cortex (Whitehead & Kuhn, 1990). The lateral neospinothalamic tract transmits sharp, localized pain, or acute pain. Chronic pain transmission is thought to occur in the paleospinothalamic tract (Whitehead & Kuhn, 1990). The term "psychogenic pain" is used to refer to pain in which no cause has been demonstrated. Psychogenic pain refers to the affective

component of chronic pain and can be seen in many different forms. Following are some of the specific chronic pain syndromes:

Myofascial Pain Syndrome (MPS):

One of the most encompassing types of pain is Myofascial Pain Syndrome (MPS). Pain arising in muscles and connective tissue, in the absence of other disease is called myofascial pain. In myofascial pain syndrome (MFS), pain is localized in one part of the body, typically the paraspinal muscles. The trigger point lies in a band of tight muscle and if this muscle is pinched or pressed it twitches and the referred pain is felt at a distance from the trigger point (McCain and Scudds, 1988; in Diamond and Coniam, 1991).

Predisposing factors of myofascial pain include anatomical abnormalities, such as a short leg, short upper arms, and scoliosis. There are a number of mechanical factors which perpetuate the syndrome which include inappropriate posture, prolonged inactivity, and job-related repetitive motions (i.e. typing, assembly line work) (Kinney & Brin, 1992).

Back Pain:

Back pain is another type of chronic pain syndrome and most commonly involved in personal injury and disability compensation cases. Myofascial pain is often the cause of back pain in these cases. Eighty per cent of

the population suffers from back pain at some time during life, and in the United States of America it is the third leading cause of disability, with 3.9 per cent of the population permanently disabled by it (Diamond and Coniam, 1991). Myofascial pain syndrome may be the single most common cause of musculoskeletal pain, usually as a result of a traumatic injury or strain. Myofascial pain is typically seen as an acute event initially, and usually presents as a chronic pain problem. The onset may be sudden, as with an injury or strain, or it may be gradual, as with a repeated mechanical stress (Kinney & Brin, 1992).

Most back pain patients referred to pain centers have undergone an extensive medical search for any problem which could be surgically corrected. The majority of these patients are referred to a pain center as a last resort, either because surgery was not an option, or because surgery failed to achieve pain relief (Kinney & Brin, 1992).

Reflex Sympathetic Dystrophy (RSD):

Reflex sympathetic dystrophy (RSD), which may occur weeks after an injury, is another chronic pain syndrome. RSD is thought to be associated with localized hyperactivity of the sympathetic nervous system. Examples of trauma which may bring about RSD are a herniated disk, poliomyelitis, stroke, or cerebral or myocardial

infarction. RSD pain symptoms are typically worsened by use of the affected body part and are typically diminished by resting the body part (Kinney & Brin, 1992).

Headaches:

The final category of chronic pain syndromes is headaches. There are many categories of chronic, recurring headaches which can be characterized as a chronic pain syndrome.

1. Musculoskeletal: These are muscle contraction headaches and are associated with mood disorders such as depression.

2. Vascular: Migraine headaches fall in this category and include cluster headaches, hypertensive headaches, and toxic-vasodilatory headaches, which are caused by carbon dioxide retention or alcohol (Kinney & Brin, 1992).

There are usually many contributory factors that influence the diagnosis of chronic pain syndromes. Diagnosing chronic pain is important for selecting the appropriate course of treatment and making a prognosis for success and ultimate return to work. Common questions to be answered in assessing chronic pain are: Is the patient likely to return to the prior job? If not, what are the prospects for rehabilitation and job retraining? Essential to the diagnosis of chronic pain is the degree to which there is underlying organic pathology to

substantiate the reported functional impairment (Kinney & Brin, 1992).

Factors used in the diagnosis of chronic pain which suggest a psychological component include multiple medical problems treated by multiple physicians, and typically include multiple pharmacological prescriptions. Physical findings often involve an overly depressed or inconsistently indifferent attitude, overt pain behavior which is out of proportion to objective physical findings (either more or less than expected), lack of physical etiology, and physical symptoms which change, or fluctuate unexpectedly (Kinney & Brin, 1992).

Psychological Profile of Chronic Pain

Because pain is a subjective experience, it follows that organic pathology cannot be the sole factor in determining how that experience is perceived by the sufferer (Diamond & Coniam 1991). Important psychological and environmental factors will interact with any physical factors to alter that experience, and the way in which this interaction occurs will vary among individuals. Personality traits of the sufferer, and the reactions of others to an individual's suffering will have an influence on the pain experience, as well as the significance which that pain seems to have to the individual (Diamond and Coniam, 1991).

Chronic pain affects the emotions and behavior of the individual, often leading to anxiety and tension, which may increase the experience of pain. The resultant loss of ability to cope with the situation, leads to loss of self confidence, increased avoidance of others, and withdrawal, increasing the helpless and hopeless plight of the sufferer. Feelings of depression frequently result, perhaps accompanied by feelings of guilt, loss of self esteem, self pity and even anger (Diamond and Coniam, 1991).

Neurotic disorders such as anxiety, depression, or exaggerated preoccupation with bodily function, are also often associated with chronic pain syndromes (Diamond and Coniam, 1991). The emotional disturbance of a pain sufferer may actually be a result of prolonged suffering. Most patients can see no connection between emotion and pain or other bodily sensations, and therefore assume that the doctor supposes that the pain is imagined. This may also suggest to the patient that all further attempts of investigate or relieve the pain have been abandoned (Diamond and Coniam, 1991).

Brena and Chapman (1981 and 1984) have studied chronic pain patients and reviewed several studies of the disability process. They describe the "5 D's" of chronic pain: Dramatization (of vague, diffuse symptoms), Drug abuse (misuse of habit-forming medications), Dysfunction

(body impairments), Dependency (passivity, depression, and helplessness), and Disability (pain contingent on financial compensation and pending litigation claims) (Brena and Chapman, 1981).

Brena and Chapman's review (1984) of the disability process revealed certain similarities between patients sustaining a disabling injury. Common factors included low self-esteem in dependent persons, inability to deal competently with stress, a demanding job, and tension at home (Weinstein, 1978). Ellard (1970) also described some significant psychological reactions to injury: lack of objective signs of suffering; medical findings do not correlate with complaints; poor motivation, i.e. passive suffering; avoidance of active treatment participation while continuing to pursue treatment (Brena & Chapman, 1984).

It is important to distinguish between impairment (a medical term) and disability (a legal term) as they are often used interchangeably. A medical impairment can be defined as the "reduction of body or organ function" (Richman, 1980, p. 367). A legal disability can be defined as a "task-specific limitation of performance" (Richman, 1980, p.367). To be eligible for disability benefits, a patient must prove that there is an inability to engage in any gainful employment because of medical impairment. On the other hand, to be eligible for

rehabilitation, the patient must demonstrate the potential for gainful employment (Osterweis, Kleinman, & Mechanic, 1987).

Because a subset of patients who suffer from chronic pain never get well, the assessment of the personality factors influencing recovery is an important aspect in identifying patients who may not respond well to a traditional pain management program (Keller & Butcher, 1991). In their book, Coping with Chronic Pain: A Guide to Patient Self-Management, Hanson and Gerber (1990) note the most difficult task in the initial psychological evaluation is this assessment of those individuals who present significant psychosocial problems that supersede the pain problem. Part of the intent of this study is to explore personality variables which may be present in chronic pain patients and which may prevent the successful completion of a pain management program and the eventual return to the work force.

Chronic Pain Measurement

The chronic pain patient may have a difficult time accepting the physician's diagnosis when psychological factors are prominent in the pain symptoms. For this reason, an objective measurement system is useful in the classification of patients with chronic pain complaints.

Obtaining a reliable and objective measure of chronic pain is difficult, however (Hebben, 1992). There are

several ways to measure chronic pain. One index of pain is the patient's subjective experience. The patient can quantify how intense pain is on a scale of 1 to 100. Verbal descriptions of pain can also be along a single dimension, like intensity or duration. For example, the patient can rate the intensity of pain in fixed categories, like no pain, mild pain, moderate pain, extreme pain, excruciating pain (Hebben, 1992).

Another subjective way of measuring pain, is for patients to graph their pain. Intensity could be indicated on the vertical line and hours of the day can be recorded on the horizontal line. These subjective reports can be taken hourly, daily, or pre and post treatment (Hebben, 1992).

Following is a review of some pain measurement instruments divided by type of instrument:

Pain Perception:

The McGill Pain Questionnaire is one measurement instrument designed to statistically quantify chronic pain (Melzack, 1975). The questionnaire contains 20 sets of words divided into four categories: sensory, affective, evaluative, and miscellaneous. The total of the four categories is the Pain Rating Index. Each patient chooses an adjective from each categories's sets of words that best describes the pain and rates current pain intensity

on a 0 to 5 scale. The short form of the McGill Pain Questionnaire is reported to have high correlations with the original (Melzack, 1987).

The Pain Disability Index (PDI) is a self-report inventory used to assess the degree to which pain interferes with daily life (Tait et al, 1990). High scores on the PDI are reported to relate to psychosomatic symptoms, stopping activities because of pain, work status, pain duration, and other factors. High test-retest reliability and validity are reported as they relate to pain-based disability (Tait, 1990).

While the PDI assesses disability related pain, the Illness Behavior Questionnaire (IBQ) identifies illness behaviors associated with chronic pain (Pilowsky & Spence, 1976). The IBQ is a 52-item self-report instrument. It contains seven scales (hypochondriasis, disease conviction, psychological versus somatic perception of illness, affective disturbance, denial, and irritability). Patients are classified into three groups: reality-oriented attitude toward illness, abnormal illness behavior, syndromes of hysteria, conversion reaction, or hypochondriasis (Pilowsky & Spence, 1976).

Coping Styles:

The Vanderbilt Management Inventory is one

instrument used to assess coping styles (Brown & Nicassio, 1987). Here, the focus is not on measuring pain levels, but on the patient's response to the pain. Responses are classified as active or passive coping strategies with increasing pain levels (Brown & Nicassio, 1987).

The Millon Behavioral Health Inventory (MBHI) is a self-administered questionnaire that addressed eight coping styles derived from Millon's personality theory, six attitudes, three psychosomatic correlates, and three prognostic indices. The MBHI is used to predict the continuation of pain behavior in the chronic pain patient (Murphy et al, 1986).

Psychopathology:

Frequently, the Minnesota Multiphasic Personality Inventory-2 (MMPI-2) is used to diagnose chronic pain. The MMPI-2 contains 567 true-false items with scores on 10 "clinical" scales and 7 validity scales (Hathaway & McKinley, 1989). Chronic pain patients typically show clinical elevations on three clinical scales: hypochondriasis, depression, and hysteria. The MMPI has also been found to predict patient treatment outcome (Stassberg et al, 1981).

The Symptom Checklist-90 Revised (SCL-90-R) is used to evaluate the status of psychological complaints. The SCL-90-R yields nine primary symptom dimensions and three

global dimensions. There is little direct research with chronic pain populations and the SCL-90-R (Duckro et al, 1985).

Behavioral Assessment:

One scale, the UAB Pain Behavior Scale examines 10 target behaviors: verbal complaints, nonverbal complaints, down-time, facial grimaces, standing posture, mobility, body language, use of visible supportive equipment, stationary movement, and medication (Richards et al, 1982). The UAB scale is reported to be useful in defining pain behaviors slated for extinction and for evaluation of treatment outcomes (Richards et al, 1982).

Multidimensional Assessment:

The West Haven-Yale Multidimensional Pain Inventory (WHYMPI, or MPI) is used in this study to assess both the psychosocial and psychophysiological factors in chronic pain. The WHYMPI focuses on assessing "the impact of pain on the patient's lives, the responses of others to the patient's communications of pain, and the extent to which patients participate in common daily activities" (Kerns et al, 1985). The WHYMPI components measure different aspects of the chronic pain experience allowing for a broad assessment of chronic pain without the use of multiple instruments (Duckro et al, 1985).

Chronic Pain Management

Chronic pain management occurs by several

professionals in the treatment of a patient. Chronic pain sufferers typically see one or more medical doctors and are then referred to a pain center. One of the first medical interventions used in the treatment of chronic pain is a nerve block. This is used to give the patient the experience of a temporary relief from pain where attention and concentration can be redirected toward improved coping skills. Blocks useful in pain management fall into several categories. These include diagnostic blocks, sympathetic blocks, peripheral nerve blocks, central nervous system blocks, and trigger point injections (Kinney & Brin, 1992).

Another common medical treatment of chronic pain is medications. Several groups of medications are also used in the management of chronic pain syndromes. These medications, known as nonsteroidal anti-inflammatory drugs (NSAID's), reduce pain and inflammation (Kinney & Brin, 1992). Antidepressant drugs, particularly tricyclic antidepressant drugs (TCAD's), are the best known and most widely used in pain management. Because serotonin appears to be inhibiting pain transmission, lowered pain perception may result. Monoamine oxidase inhibitors (MAOI's) are another class of antidepressants often used for the potential analgesic benefits (Kinney & Brin, 1992).

Another common way of "breaking the pain cycle" is transcutaneous electrical nerve stimulation (TENS). This is an attempt to interfere with pain transmission and hence - break the cycle of pain (Kinney & Brin, 1992).

Psychological pain management focuses on many factors. Techniques aimed at pain reduction and improving coping mechanisms include relaxation training, biofeedback, hypnosis, stress management and behavioral modification. Psychotherapy which emphasizes the behavioral aspects of pain management is also a typical aspect of most pain treatment centers. Such treatment approaches help to break down communication barriers of suspicion, resentment, and anger, which are common reactions to the suggestion that a "psychological" component is part of the pain problem (Kinney & Brin, 1992).

Pain center treatments are primarily directed toward the relief of trigger point pain (common in myofascial pain syndromes). Neuromuscular reeducation and physical therapy is helpful to improve muscle tone and strength, increase activity tolerance and endurance, and reduce muscle spasms and muscle tension (Kinney & Brin, 1992). The overall goal of most pain treatment centers is to help patients to overcome the disabling effects of chronic pain and return them to a productive life, rather than to continue being dependent on the health care system. In

studies investigating pain treatment centers, the measure of success is the return of the worker to the workplace (Arnoff & McAlary, 1992).

In reviewing the literature regarding pain center success, rates in returning patients to the workplace range from 20% to 81% (Addison, 1981; Chapman & Bradford, 1981). In another review of outcomes from a number of chronic pain center programs, 20% to 50% of patients had returned to work within 1 year or less following treatment (Brena & Chapman, 1981). These discrepancies may be attributed to differences among pain centers themselves or to differences among patients.

The outcome results are consistent for all studies reviewed (Painter, Seres, & Newman, 1990; Vasudevan, Lynch, & Abram, 1991; Newman, Seres, Yospe, & Galington, 1988; Meilman, Skultety, Guck, & Sullivan, 1985). For example, Painter, Seres, and Newman (1990), found that 52% of patients completing pain programs were unemployed at 6 months follow-up and 45% were receiving compensation at 6 months post treatment. Vasudevan et al (1991) found that at 1 year post treatment, unemployment levels ranged from 55% to 80%. And at 18 months after treatment, Newman et al (1988) found even though most patients reported improved ability to cope with pain, higher activity levels, and less analgesic use, 70% remained unemployed.

Meilman et al (1990) conducted the most longitudinal study reviewed, and reported that from 18 months to 10 years following pain center treatment, 32% of patients remained unemployed and none that were working were employed full time.

All of these studies showed a discrepancy in patients who returned to work following treatment and patients who did not return to work following treatment. None of these studies used a comparison or control group. In an outcome study by Guck et al (1989) treatment and no-treatment groups were used in a comparison of post-treatment results at 1 and 5 years after discharge. Further, 60% of the treated patients met a stringent set of pre-admission criteria for success, whereas none of the untreated patients met this criteria. The criteria included employment, up out of bed at least 8 hours per day, no compensation for pain problems, no pain-related hospitalizations or surgeries, and no narcotic or psychotropic medications. Significantly more treated patients than non-treated patients remained employed, reported less pain interference with daily activities, and noted less depression. The pre-admission criteria resulted in significant differences as well between ratings of success for the treated group (Guck et al, 1989).

Object Relations

The following section of the literature review contains relevant information about object relations. It is divided in two sections: (1) Object Relations Theory and (2) Object Relations and the Pain Patient

Object Relations Theory

The concepts associated with object relations theory characterize a shift in the way early childhood events are construed. Object relations theory focuses on relations with others, which may be internal or external, but are essentially centered around interactions with other human beings (Fairbairn, 1952).

Object relations developed as a reaction to a psychoanalytic perspective that was heavily dominated by biological, i.e., instinctual, concerns (Klein, 1945). A great deal of writing in the field of object relations comes out of work with psychoanalytic patients (Klein, 1945). The basic premises of object relations and psychoanalysis are so different that the two may be incompatible with one another. Guntrip (1961) seemed to bridge this distinction in his concept of a systems ego replaced by that of a person ego. Fairbairn (1952) also seems to move away from traditional psychoanalytic terminology and ideas like libidinal energy and move toward interpersonal constructs such as the infantile libidinal ego and antilibidinal ego.

A common thread in the writings of object relations theorists' ideas seems to be a reaction away from Freudian instinctual drives. Not only is human behavior fueled by relational concerns, but also the human psyche is fundamentally relational in nature. The early caretaking relationship seemingly forms a template for all subsequent relationships.

In Klein's (1945) observations of children, she observed that children devoted more energy to construing their interpersonal worlds than to trying to control libidinal impulses. The internal representations of figures, or the internal object world of the child, were the stuff of which the psyche was made. This inner world of the child is a world of human relationships (Klein, 1945).

A basic tenet of object relations theory in general seems to be that the core of selfhood is inextricably tied to the infant's first and most fundamental object relationship-the relationship with the mother. This relationship more than any other seems to form the foundation for the construction of the child's inner world. Splitting the object is a child's way of dealing with an inconsistent and unsatisfactory world, or an inconsistent and ungratifying mother. The child constructs an inner world inhabited by different aspects of the mother. By dividing the mother into good and bad

components and splitting off one from the other, the child is able to maintain his dependent ties without constantly feeling threatened. The result is an inner world that is split into "good" and "bad" internal objects, each corresponding to the gratifying and ungratifying aspects of the mother (Fairbain, 1952; Guntrip, 1960).

Object Relations and the Pain Patient

Chronic pain from an object relations perspective suggests that physical disability is a function of affective elements of the experience of chronic pain. An object relations approach to investigating chronic pain posits that people may relate to their pain as a kind of internalized entity, or object. And as such, patients may have a diverse range of reactions to chronic pain. The purpose of looking at chronic pain from an object relations perspective is to imply that the experience of chronic pain is not primarily defined by rational or cognitive processes, but rather, is influenced by affective, internalized object related experience. Further, returning to work following treatment may be mediated by these internal representations of objects (Block, 1988).

A number of concepts are associated with object relations theory and will be examined using four subscales of the Bell Object Relations Inventory (BORI) (Billington & Bell, 1985). The first subscale, Alienation (Aln) is

associated with a basic lack of trust in relationships. When a child experiences unstable and superficial early relationships, disappointment and frustration result and as such, the individual may come to have a victimized and abused perception of self (Spitz, 1965; Kernberg, 1975). In previous research, this subscale has been associated with severe character disorders, but has not been studied in relation to chronic pain patients. Chronic pain patients have been described as having dependent relationships and as projecting aggression, which may appear in elevated scores on the Alienation subscale of the BORI.

Insecure Attachment (IA) is another subscale of the BORI and is associated with painful interpersonal relations. Individuals with insecure attachments are easily hurt by others and are sensitive to rejection. Previous research has linked insecure attachment with avoidant, dependent, and passive-aggressive personalities but not with chronic pain specifically (Billington & Bell, 1985). Within object relations theory, chronic pain patients may develop sadomasochistic interactions with doctors and employers as an outward expression of the insecure attachments represented internally.

Egocentricity (Ego), the third subscale of the BORI, is associated with attitudes of mistrust and exploitation. Egocentric object relations have no

awareness or concern for others' feelings. These individuals believe everyone is out to humiliate and defeat everyone else (Billington & Bell, 1985). These types of interactions can be seen in chronic pain patient's disbelief when no conclusive medical findings evidence their pain and suffering, although no studies have linked this with object relations.

The final scale of the BORI used in this study is social incompetence (SI). It is associated with shyness and nervousness in interactions with the opposite sex. The scale is associated with social insecurity and the absence of close and satisfactory sexual adjustment (Billington & Bell, 1985).

The BORI has not been used in any research studies investigating chronic neck and back pain patients. The BORI has, however, been documented in studies investigating schizophrenia (Bell, Morris, Lysaker, & Milstein, 1992), multiple personality disorders (Alpher, 1991), and eating disorders (Heesacker & Neimeyer, 1990).

The BORI has also been used to investigate object relations in psychosomatic chronic pain patients (Ascencao, 1992). Here, the BORI was used to compare psychosomatic chronic pain conditions (gastric ulcer, idiopathic hypertension, rheumatoid arthritis, and ulcerative colitis) versus healthy non-psychosomatic disorder subjects. The results of this exploratory study

suggest that differences in the object relations exist between rheumatoid arthritis subjects and normal controls, although not between rheumatoid arthritis subjects and other psychosomatic chronic pain subjects. Alexithymia was also found to differ significantly between rheumatoid arthritic subjects and normal controls, confirming current psychodynamic thought that object relations and alexithymia may influence a patient's response to stress and their ability to resume a normal life, free of pain and suffering (Ascencao, 1992).

Alexithymia

The final section of the literature review examines the construct of alexithymia. This section contains the following headings: (a) Alexithymia Defined and (b) Alexithymia and the Pain Patient.

Alexithymia Defined

In addition to object relations, this study investigated the presence of alexithymia in chronic pain patients. Alexithymia refers to the inability to express feelings verbally and to the tendency to fantasize (Sifneos, 1973). Fantasy has been found to be characteristic of psychosomatic patients in general, although it has not been studied specifically in chronic pain patients (Blumer and Heilbronn, 1982).

The most frequently mentioned mediating link between earlier experiences and chronic pain is depression (Beutler, Angel, Oro'-Beutler, Daldrup, & Meredith, 1986; Romano & Turner, 1985). The general assumption here is that events which happened in early childhood, result in certain personality traits and depressive tendencies that facilitate the adult's development of chronic pain syndrome. Blumer and Heilbronn (1982) suggest that chronic pain which is from an unknown source is a variant of depression. It is hypothesized that pain patients develop a form of "masked depression", since they are unable to recognize and verbalize their real feelings. As a result of this tendency, referred to as "alexithymia" (Sifneos, 1973), patients express their emotional pain (i.e. depression) in the form of somatic pain.

Pinsky and Malyon call these patients "dyslexithymic" or "hypothymic", words derived from Sifneos (1973) "alexithymic" description of psychosomatic patients. In addition to this hypothesized inability to recognize emotions, it is likely that many patients try actively to suppress or deny the emotional pain relating to adverse earlier life experiences. Thus, it seems possible that object relations and alexithymia may influence chronic pain patients response to stress. Moreover, object

relations and alexithymia may also affect the perception of stress, thus affecting the way the individual deals with the stressor.

Alexithymia has been correlated with lower educational levels and age (Pasini, Chiaie, Seripa, & Ciani, 1992). In this study, TAS scores were significantly greater in higher age groups and subjects with lower educational levels scored significantly higher on factors 1, 2, & 4: ability to distinguish feelings and bodily sensations, ability to describe feelings, and externally oriented thinking (Pasini et al, 1992). These findings are in contrast to an earlier study by Parker et al (1989) who found alexithymia was not associated with age, education, socioeconomic status, or intelligence.

Alexithymia has also been strongly associated with immature ego defenses, but not with depression (Wise, Mann, & Epstein, 1991). These findings suggest that alexithymia is a separate construct from depression and from primitive defensive operations in general.

Alexithymia and the Pain Patient

Alexithymia and chronic pain disorders have only recently been studied. It is hypothesized that rather than experiencing a painful affect, chronic pain patients try to escape and avoid emotional pain and therefore

appear alexithymic (Blumer, 1982). Blumer (1982) further hypothesizes that pain patients avoid and escape hard work and excessive activity.

The role of alexithymia, or constricted affect, as an intervening variable modifying outcome of chronic pain treatment has just recently been investigated. In one study in Finland, the role of alexithymia and hostility as intervening variables modifying treatment outcome were investigated (Julkunen, 1988). Female subjects (n=175) who reacted favorably to a back rehabilitation intervention were found to be lacking in hostility and alexithymia. Female subjects who did not respond favorably to the back school were found to score higher on alexithymia and hostility measures. In the 1-year follow-up, subjects who showed increasing disability were characterized as having restricted expression of emotion, a trait common to alexithymia (Julkunen, 1988).

In a Canadian study, chronic pain with and without alexithymia was investigated. The alexithymic subjects (n=16) were found to have higher associations with physical illness compared to nonalexithymic subjects (n=41) (Chaturvedi, 1988). Although treatment outcome was not a variable in this study, the findings suggest that chronic pain patients may have a tendency to be more

alexithymia, have relatively more organic disease, and be less responsive to traditional verbal interventions (Chaturvedi, 1988).

In another Canadian study, it was found that alexithymia traits occurred in chronic pain syndromes as an alternative means of affect communication (Catchlove, 1987). Subjects in this study (n=45) were found to have low self-esteem and an inability to show feelings such as sadness and anger, further linking chronic pain and alexithymia.

A significant relationship has been found between Toronto Alexithymia (TAS) scores for alexithymia and self-reported health symptoms (Kauhanen, Julkunen, & Salonen, 1992). The inability to identify feelings factor on the TAS was significantly correlated with a variety of psychosomatic disorders. The relationship between alexithymia and abnormal illness behavior is further supported by Wise et al, (1990), in that alexithymic subjects endorsed more disease conviction, hypochondriacal concern, affective inhibition, affective disturbance, and irritability.

The preceding literature review on the constructs of object relations and alexithymia outlined how the internal experience of pain as mediated by internal representations of early relationships, or objects relations, and the inability to express emotions, or alexithymia, may be

involved in the development and maintenance of chronic pain. Although object relations, alexithymia, and chronic pain have not been explored specifically, the literature review provided a basis for designing this study.

CHAPTER III

METHODOLOGY

This chapter contains the methodology for this research study. It is divided into the following sections: (a) Sample, (b) Procedures for Data Collection, (c) Research Instruments, and (d) Data Analysis.

Sample

The sample for this study consisted of (1) 100 subjects diagnosed with chronic pain, and (2) 100 non-pain subjects who were in job categories represented by those in the chronic pain group. The chronic pain subjects were selected from all patients who presented themselves for treatment beginning July 1994 at a regional area chronic pain treatment center that currently provided treatment to chronic pain patients from medical referrals. All patients were diagnosed with chronic pain by a medical physician and all patients were diagnosed with chronic pain following an injury. After being referred to the center, the patients were asked directly if they would be interested in participating in this research project.

The chronic pain treatment center was a free-standing outpatient referral center. The treatment component lasted a minimum of two weeks and a maximum of 6 weeks with the mean length of stay, being four weeks. The chronic pain treatment program consisted of the following components:

work hardening, education, biofeedback/relaxation training and medical management. The staff at the treatment center consisted of a physical therapist and two physical therapy assistants, one occupational therapist and an occupational therapy assistant, and two licensed clinical psychologists and one licensed psychological examiner. Following is a description of each of the components involved in the treatment program.

The work hardening, or physical therapy, component of treatment program consisted of physical reconditioning, which included both strengthening and aerobic conditioning, and work simulation. The work hardening component was overseen by a physical therapist and an occupational therapist. These professionals determined the physical reconditioning needs and job demands of each patient that would be required for that individual to return to work. An individualized strengthening and aerobic training program was then developed for each patient to include the daily use of weight machines and free weights to strengthen damaged and weak muscle groups, and daily aerobic training to include riding a stationery bicycle, walking outdoors, and walking on a treadmill. Each patient began their work hardening component for 4 hours per day for the first week of the program, increasing to a full day of exercise with work simulation beginning the second week of the program.

The education component of the program consisted of one hour per day of group presentations by different staff members. Each day of the week, a different staff member would meet with the pain patients for one hour, to educate them on a different aspect of chronic pain and its management. The topics presented to the pain patients are presented in Table 1.

The biofeedback/relaxation training component of the program consisted of instructing the patients on the rationale for relaxation training and pain reduction. Each patient was instructed individually on how to breath diaphragmatically and how to do progressive muscle relaxation. All patients were instructed to lay down on a mat in a relaxation room and were taken through the progressive muscle relaxation exercise daily. Each patient was given an audio cassette tape of the progressive muscle relaxation exercise and instructed to practice two additional times per day.

The medical management involved in the treatment program was provided by each patient's physician. The physician had an appointment scheduled with each patient during the treatment program and following their treatment program. During their physician appointments, the patients were evaluated on the status of their pain condition and may have received a medical intervention.

Table 1

Education Topics For Chronic Pain Patients

Accepting the Fact of Having Chronic Pain
Setting Specific Goals for Work, Recreation/Hobbies,
and Social Activities
Dealing with Anger and Your Pain
Medications and Pain
How to Take Medications and Taper Them Off
Physical Fitness and Pain
Relaxation Training and Practice
Distracting Response to Pain
Pacing Your Activities
Role of Family in Recovering from Pain
Communicating with your Doctor
Empathy for others in Pain
Medical Update on Chronic Pain Treatment
Workers Compensation Issues
Nutrition and Pain
Anatomy of Neck and Back Injuries
Reasons to Remain Hopeful
Discharge Planning
Stress and Pain
How Emotions Affect Pain
Focusing on Non-Pain Behaviors

The 100 non-pain subjects were obtained by selecting non-pain workers who were employed in job classifications similar to the chronic pain subjects. Individual employers were contacted by the investigator to initiate a cooperative data collection process. Companies that participated in the non-pain group are presented in Table 2. The companies involved in the study were all located in the southeast region of the country. Data collection lasted 9 months.

Procedures for Data Collection

The following procedures were used to collect data for the chronic pain group.

1. Beginning July 1994, all patients who presented themselves for treatment at the pain treatment center were asked if they would participate in this project. Each participant was given the same verbal information as to the nature of the project and was given an informed consent form, further explaining their participation. (See Appendix A.1). Each participant was asked to sign and keep this informed consent form.

2. The chronic pain subjects who decided to participate in this study were given a packet which contained a duplicate informed consent form, a sociodemographic/chronic pain information sheet

Table 2

Companies Where the Non-Pain Subjects Were Employed

ABC Fence and Roofing
All-Rite Sealing
Allied Construction
Allied Floors
Blue Ridge Community Hospital
Cherokee Millwright
CW Consumer Wholesale
Fannin Regional Medical Center
Holiday Van Lines
Lakeridge Mental Health Center
Lumpers & Humpers
M & S Sewer and Plumbing
Morristown Dry Wall
Mr. Transmission
Parkwood Medical Center
Pemberton Truck & Trailer
Scott County Medical Center
Southern Building Service
Superior Home Health Agency

(See Appendix B.1) and the two paper and pencil measures used in this study: The Bell Object Relations Inventory (BORI) and the Toronto Alexithymia Scale (TAS). The packets were given to the chronic pain subjects during their initial two days of evaluation at the treatment program. Each participant was given a quiet and private, or semi-private, environment to complete the packets on site. Each packet required approximately 30-45 minutes to complete. All administrations were monitored closely by a treatment center staff person.

3. The data collection process was standardized by training two on-site treatment staff on data collection procedures. Both staff members were given the same script to use in presenting the project to the chronic pain subjects. All participants were told to complete their packets in the order presented.

4. Prior to distributing the packets, the order that the BORI and the TAS were presented was randomly varied. The informed consent form (always presented first in the packets) was removed from the packets and stored separately prior to this researcher seeing the data, to ensure anonymity of the participants.

5. An audio tape of all information in the packets was made available for illiterate participants, participants who preferred an audio presentation, or for visually impaired participants. Because the audio tape

option was thought to represent a small percentage of the total data, the audio tape did not vary the order of the instruments. The tape was made using professional recording equipment and was monitored closely during the administration. Only one individual chose the audio tape presentation.

6. The chronic pain subjects were contacted at 6 months following discharge from the chronic pain management program to answer questions regarding work status, pain intensity, doctor visits, etc.

The following procedures were used to collect data for the non-injured workers.

1. A list of companies employing chronic pain patients for the last two years was generated. The companies were labeled according to job classification and occupational areas. To ensure that similar job classifications of non-injured workers were sampled, two methods were used: (a) The companies that actually have referred patients to the pain treatment center over the past two years were contacted to enlist participation of non-injured/non-chronic pain subjects (b) Companies employing similar job classifications were contacted for non-injured/non-chronic pain subjects.

2. Beginning in July 1994, this researcher contacted employers and set up appointments to discuss the research project and answer any questions the employers had

regarding the study. The employers, or their designated representative for the company, were mailed packets to distribute to the subjects who agreed to participate. The completed packets were then mailed back to the researcher.

3. Each non-pain subject who decided to participate was given an informed consent form to sign and keep (See Appendix A.2). Each non-pain subject was then asked to complete a packet containing a duplicate informed consent form, a sociodemographic information sheet (See Appendix B.2) and the two research instruments: the BORI and the TAS. Just as with the chronic pain group, non-pain subjects were offered an audio taped version of the instruments. As with the pain sample, the packets for the non-pain group randomly varied the order of presentation of the instruments. No one from the non-injured sample chose the audio cassette presentation.

Data collection for the non-injured workers lasted 6 months.

Research Instruments

Bell Object Relations Inventory (BORI)

In the present study, object relations was measured by the Bell Object Relations Inventory (BORI). The Bell Object Relations Inventory (BORI) is embedded within the Bell Object Relations Reality Testing Inventory, or BORRTI (Bell, Billington, and Becker, 1985) which was developed

to yield an objective and empirical measure of the object relations and reality testing ego functions as defined by Bellack, Hurvich, and Gediman (1973). The present study used the Bell Object Relations Inventory (BORI) which consists of forty-five true/false statements that represent a range of object relations in the form of quality of interpersonal relationships. Each item was previously assigned a value ranging from a low of 1 to a high of 6.5 on its correspondence to Bellack et al.'s (1973) clinical descriptions (from which was developed the scale of ego functions).

Scoring the BORI yields four subscales which were factor analytically derived. The subscales are: Alienation, Insecure Attachment, Egocentricity, and Social Incompetence. In each subscale, a score is considered elevated by a $T > 60$ (Bell, Bellington, Cicchetti, & Gibbons, 1988). In terms of reliability, the subscales have shown good levels of split-half reliability ($r = .86$, $p < .001$). Further, they seem to be generally free of response bias as relating to age, sex, or social desirability (Bell, et al., 1988; Gibbons, 1984). No data were reported on test-retest reliability.

Replication of factor analysis for the BORI confirmed the factor structure of the four subscales (Bell, et al., 1986). The subscales were found to have high internal consistency and were free of age, sex, or social

desirability response bias. Bell et al. (1986) documented that the subscales appear to represent common features of personality.

The Alienation subscale contains loadings from the greatest number of items and is the broadest dimension of object relations measured. Bell (1985) used this subscale to differentiate patients with borderline personality disorders in an inpatient hospital setting. Patients who scored high on the Alienation subscale were suspicious and guarded, and were reluctant to invest themselves with others, believing that relationships were not gratifying and would inevitably fail. This study linked Alienation to projection of aggressive impulses onto others, attitudes of paranoia, animosity, and contempt (Bell, 1985).

The Insecure Attachment subscale was found to correlate with the Alienation subscale, reflecting a relationship between interpersonal pain and a severe sense of alienation (Bell, 1985). The previous research on this scale linked Insecure Attachments to personality traits associated with avoidant, dependent, compulsive, or passive-aggressive personality disorders (Bell, 1985).

The Egocentricity subscale was correlated with narcissistic personality traits (Bell, 1985). Patients who scored high on egocentricity were found to have one of three general attitudes toward relationships: mistrust of

the motivations of others; others exist only in relation to oneself; and others are to be manipulated for one's own needs (Bell, 1985).

The Social Incompetence subscale was not found to link with any diagnostic category. Patients who scored high on Social Incompetence endorsed items on self report measures indicative of shyness, nervousness, and uncertainty about how to interact with members of the opposite sex (Bell, 1985).

Toronto Alexithymia Scale (TAS)

The present study also included a scale to measure alexithymia. The Toronto Alexithymia Scale or TAS (Taylor, Ryan, & Bagby, 1985) measures the degree of alexithymia through a 26-item self report questionnaire. Each item on this scale is rated on a 1-to-5 point Likert Scale (ranging from agree to disagree) with total scores ranging from 26 to 130. Recently, Taylor, Bagby, Ryan, Parker, Doody, & Keefe (1988) have established the cut off scores for the TAS. They defined the alexithymic range to be scores of 74 or greater, and the nonalexithymic range as scores of 62 or less. The cut-off score of 74 was used in this study.

Taylor et al. (1985) have reported in a study of 542 college student's TAS scores to have adequate internal consistency ($r=.79$), good test-retest reliability ($r=.82$, $.75$, $.77$) for 1 week, 5 week, and 3 month periods

respectively and that the TAS is free from social desirability response bias. Bagby, Taylor, Parker, & Loiseil (1990) have also found the TAS to be a reliable and valid measure of the alexithymia construct. Further, these researchers cited five other studies with similar results in terms of convergent, discriminant, and criterion validity plus test-retest reliability.

Millard (1992) studied the TAS as a potential measure of constricted affect among 195 patients with chronic, nonmalignant pain and found good reliability for the social introversion factor and lack of proneness of fantasy factor. The TAS has also been found to correlate well with an interview-based evaluation of alexithymic features, suggesting that the scale is a useful screening instrument for alexithymic features (Kauhan, Julkunen, & Salonen, 1992).

Parker et al (1991) examined the relationship between alexithymia and depression as measured by the TAS and the Beck Depression Inventory. Results provide evidence that alexithymia is a separate and distinct construct from depression.

A revised version of the TAS, which was used in this study, has demonstrated good internal consistency and evidence of convergent and discriminant validity (Taylor, Bagby, & Parker, 1992). Criterion validity was

established by discriminating between alexithymic and nonalexithymic behavioral medicine outpatients (Taylor et al, 1992).

Data Analysis

Statistical Analysis

Discriminant analyses were used to test hypotheses 1 and 2. Discriminant analysis is the statistical technique most commonly used to identify variables that are important for distinguishing between groups whose membership is known and to develop a procedure for predicting group membership for new cases whose group membership is undetermined. In a discriminant analysis, the dependent variable is categorical, and the independent variables are metric.

<u>Dependent Variables</u>	<u>Independent Variables</u>
Ho ₁	
Chronic Pain Patients and Non-Chronic Pain Workers	BORI Subscales (Aln, IA, Ego, SI) and TAS score
Ho ₂	
Return to work and Non-Return to Work Chronic Pain Patients	BORI Subscales (Aln, IA, Ego, SI) and TAS score

The concept underlying discriminant analysis involves linear combinations of independent variables, called predictor variables, which serve as the basis for distinguishing cases into groups (Norusis, 1990).

CHAPTER IV

RESULTS

Chapter IV is presented in two sections: (a) Descriptive Statistics for the Sample, and (b) Statistical Results from the Study. The Descriptive Statistics for the Sample section are provided for a clearer understanding of the two separate samples: Pain and Non-Pain.

Descriptive Statistics for the Sample

The demographic information collected on the two groups is presented in Table 3 to show the representation of the sample according to gender, race, marital status, and annual income. Percent frequencies are given for each variable and divided into Pain versus Non-Pain categories in order to assess the comparability of the two groups as a function of demographics.

The mean age for all subjects (both pain and non-pain subjects) was 39.44 years. There was little difference in the mean age of the subjects between groups, with the pain group mean at 38.03 years of age and the non-pain group mean at 40.95 years of age.

The age the subjects started working is broken down further by group and gender. These data are presented in Table 4 and summarized in Table 5 by categories of age started working, group, and gender. For both groups, the men started working earlier in life than did the women.

Table 3

Percent Frequencies of Gender, Race, Marital Status,
Annual Income, and Age Started Work

<u>Variable</u>	<u>Percent Frequency</u>	
	<u>Pain</u>	<u>Non-Pain</u>
<u>Gender</u>	<u>n=100</u>	<u>n=100</u>
Female	36.0	52.0
Male	64.0	48.0
<u>Race</u>	<u>n=98</u>	<u>n=99</u>
Minority	25.0	25.0
White	73.0	74.0
<u>Marital Status</u>	<u>n=99</u>	<u>n=100</u>
Married	69.0	77.0
Divorced	13.0	10.0
Single	13.0	9.0
Re-Married	4.0	3.0
Widowed	0	1.0
<u>Annual Income</u>	<u>n=95</u>	<u>n=97</u>
Under 20K	65.0	83.0
20K - 35K	28.0	12.0
35K - 50K	2.0	2.0
<u>Age Started Work</u>	<u>n=96</u>	<u>n=100</u>
Under 16	39.0	21.0
16-18	47.0	49.0
over 19	10.0	30.0

Table 4

Mean Age Started Work for Pain and Non-Pain Groups by Gender

Group	Gender	Mean Age
Pain(n=36)	Female	17.88
Pain(n=64)	Male	15.61
Non-Pain(n=52)	Female	21.36
Non-Pain(n=48)	Male	16.52

Table 5

Percent Frequencies of Age Started Work Categories for Pain and Non-Pain Groups by Gender

	Pain(n=96)		Non-Pain(n=100)	
	Female	Male	Female	Male
<u>Age Started Work</u>				
Under 16	29%	48%	17%	25%
16-18	60%	43%	37%	63%
Over 19	11%	9.8%	46%	13%

A comparison of job classifications by group is shown in Table 6.

Table 6

Job Classifications of Pain and Non-Pain Subjects

<u>Type of Work</u>	<u>Pain(n=87)</u>	<u>Non-Pain(n=97)</u>
Construction/Maintenance	32.2%	23.7%
Dietary/Food Service	9.2%	22.7%
General Labor	11.5%	8.2%
Healthcare	11.5%	25.8%
Housekeeping	5.7%	10.3%
Heavy Equip. Operator	6.9%	7.2%
Secretarial/Clerical	0	2.1%

The defining characteristic of Table 6 is that all job categories are non-professional or para-professional in nature and are blue-collar, or skilled labor positions. A complete listing of each job title is presented in Appendix E.

The demographic information is broken down further for the pain group. The type of injury (neck, back, or shoulder) sustained by the pain group is presented in Table 7. There was an additional category for pain patients which does not represent a job classification or

type of injury, but does represent a significant proportion of injuries. Motor Vehicle Accidents represented 10.3% of the pain patient's injuries. None of the non-pain subjects fit this category. All subjects in the pain group, regardless of the type of injury, were diagnosed with chronic pain. Because this information was missing for 9 cases, the calculations were based on N=91.

Table 7

Frequency and Percent Frequency for Pain Group Type of Injury

<u>Injury</u>	<u>Frequency</u>	<u>Percent Frequency</u>
<u>Neck</u>	27	29.7
<u>Back</u>	55	60.4
<u>Shoulder</u>	9	9.9

The majority of pain patients were male (64%). Only 10% of the pain group was currently in litigation regarding their injury. The median number of doctors the pain subjects had been to prior to participating in this study was 3, with the range number of doctors from 1 to 10.

The non-parametric Chi-square test of homogeneity was used to assess whether the pain and non-pain samples differ with respect to demographic variables. As can be seen from Table 8, the samples are homogeneous with regard to the demographic data except for gender ($\chi^2 = 2.88$, $p > .05$). There were significantly more men in the pain group than women (64 men versus 36 women), while the non-pain group was more evenly distributed across gender (48 men versus 52 women).

Table 8

Chi-Square Test of Homogeneity Comparing Demographic Data
from the Pain and Non-Pain Samples

<u>Variable</u>	<u>χ^2</u>	<u>df</u>	<u>Significance</u>
Gender	2.880	1	.090
Age	81.281	44	.001
Ethnicity	167.218	2	.000
Marital Status	363.286	4	.000
Annual Income	175.500	2	.000
Age Started Work	355.531	22	.000

Statistical Results from the Study

The null hypotheses for this study were:

H₀₁: Neither Object Relations scores as measured by the BORI four scales of Alienation, Insecure Attachment, Egocentricity, and Social Incompetence, nor Alexithymia as measured by the TAS differentiate chronic pain patients from non-pain individuals.

H₀₂: Neither Object Relations scores as measured by the BORI four scales of Alienation, Insecure Attachment, Egocentricity, and Social Incompetence, nor Alexithymia as measured by the TAS predict whether chronic pain patients return to work at six months following treatment for chronic pain.

In both hypotheses one and two, all cases were processed in discriminant analyses. Hypotheses one was based on N=200 and hypothesis two was based on N=100. No cases were excluded from the analysis. The number of cases by group can be seen for hypothesis one in Table 9 and for hypothesis two in Table 10.

Discriminant analyses were performed using the four object relations scores and the alexithymia score as predictors of membership in two groups (pain/non-pain for hypothesis one, and return to work/non-return to work for hypothesis two). One discriminant function was calculated for each hypothesis. The univariate test statistics for

Table 9

Hypothesis One Case Summary

<u>Group</u>	<u>Number of Cases</u>
Non-Pain	100
Pain	100

Table 10

Hypothesis Two Case Summary

<u>Return to Work</u>	<u>Number of Cases</u>
Yes	52
No	48

the five discriminator variables are presented first. Univariate techniques were used to begin analyzing the differences between the groups.

The Wilks' lambda test, or U-Statistic, is presented first as a significance test for the equality of group means for each variable. Here the calculated value was converted into a comparable F value and compared against a critical F value to reject or not reject the null hypothesis. When the significance level is small (less than 0.05), the hypothesis that all group means are equal is rejected (Norusis, 1990).

When variables are considered individually, lambda is the ratio of the within-groups sum of squares to the total sum of squares. A lambda of 1 occurs when all group means are equal. Values close to 0 occur when within-group variability is small compared to the total variability. Thus, large values of lambda indicate that group means do not appear to be different, while small values indicate that group means do appear to be different (Norusis, 1990). Tables 11 and 12 contain the Wilks' lambda tests for equality of group means for hypotheses one and two.

Table 11

Test for Equality of Group Means for Pain and
Non-Pain Samples

Variable	Wilks' Lambda	F	Significance
	df=1	df=198	
TAS*	.57565	146.0	.0000
ALN*	.67332	96.06	.0000
IA*	.69994	84.88	.0000
EGC*	.86602	30.63	.0000
SI*	.96281	7.648	.0062

TAS=Toronto Alexithymia Scale

EGC=Egocentricity

ALN=Alienation

SI=Social Incompetence

IA=Insecure Attachment

Table 12

Test for Equality of Group Means for
Chronic Pain Patients Who Return to Work
or Do Not Return to Work

Variable	Wilks' Lambda	F	Significance
	df=1	df=98	
TAS	.45766	116.1	.0000
ALN	.45181	118.9	.0000
IA	.51433	92.54	.0000
EGC	.50545	95.89	.0000
SI	.79651	25.04	.0000

For both hypotheses, the significance level, or probability value, is small for all variables and is less than 0.05, which rejects the null hypothesis that all group means are equal. All of the predictor variables are significant ($p < .05$) which indicates that most of the total variability is attributable to differences between the means of the groups.

Alexithymia accounts for the most variability between groups for both hypotheses. For pain and non-pain individuals, Table 11, the Wilks' lambda = 0.57, $F(198) = 146$, $p = .0000$, indicates that alexithymia is the variable where the means are the most different. Similarly, for pain patients who return to work and those who do not

return to work, Table 12, the Wilks' $\lambda = 0.45$, $F(98) = 116.1$, $p = .0000$, identifies alexithymia as the variable with the most difference between means.

Next, univariate statistics were used to analyze the differences between group means. The means and standard deviations for the five independent variables are presented in Table 13 for the pain group and the non-pain group and in Table 14 for pain patients who returned to work and those who did not. In comparing the means and standard deviations for the pain group, non-alexithymic individuals were not represented in the sample. For the non-pain group, alexithymic individuals were not represented in the sample.

The cutoff scores used to determine alexithymia in this study was 74 or greater and to determine non-alexithymia, was 62 or less (Taylor et al, 1988). The cutoff scores used in this study for the BORI subscales were 16.5 for alienation (ALN), 13.5 for insecure attachment (IA), 5.5 for egocentricity (EGC), and 5.5 for social incompetence (SI) (Bell et al, 1985).

Relationship data in the form of a pooled within-groups correlation matrix were computed next to examine the interdependencies among the 5 predictor variables. The matrices (Tables 15 and 16) were obtained by averaging, or pooling, the separate coefficients.

Table 13

Group Means and Standard Deviations for Pain
and Non-Pain Samples

Variable	Group			
	Pain		Non-Pain	
	M	SD	M	SD
TAS	77.46	10.92	58.22	11.58
ALN	11.42	6.00	4.31	4.07
IA	9.90	6.05	3.54	3.31
EGC	5.43	3.92	2.63	3.18
SI	1.37	2.32	.59	1.58

Table 14

Group Means and Standard Deviations for Pain Patients
Who Return to Work or Not Return to Work

Variable	Group			
	Return to Work		Not Return to Work	
	M	SD	M	SD
TAS	69.76	9.13	85.79	4.95
ALN	7.17	4.76	16.02	3.09
IA	5.86	4.78	14.27	3.85
EGC	2.78	3.01	8.29	2.56
SI	.36	.92	2.45	2.85

Table 15

Pooled Within-Groups Correlation Matrix for Pain
and Non-Pain Samples

	TAS	ALN	IA	EGC	SI
TAS	1.00000				
ALN	.63721	1.0000			
IA	.55806	.82790	1.0000		
EGC	.59181	.76059	.61643	1.0000	
SI	.39131	.51205	.41963	.43319	1.0000

198 degrees of freedom

Table 16

Pooled Within-Groups Correlation Matrix for Chronic Pain
Patients Who Return to Work or Do Not Return to Work

	TAS	ALN	IA	EGC	SI
TAS	1.0000				
ALN	.41624	1.0000			
IA	.40315	.75996	1.0000		
EGC	.32652	.47032	.35692	1.0000	
SI	.16958	.24724	.17740	.22539	1.0000

98 degrees of freedom

For both hypothesis one and hypothesis two, insecure attachment and alienation subscales are the most highly correlated (.8279 and .75996 respectively) and account for the largest proportion of variance. For the pain and non-pain group, 67.24% of the variance is accounted for by insecure attachment and alienation. For the pain patients who return to work and do not return to work, only 56.25% of the variance is accounted for by insecure attachment and alienation. Thus, insecure attachment and alienation account for the most variance for both hypotheses, although much variance is still attributable to the other variables.

A check of homogeneity of variance-covariance was computed to assess the probability of misclassification of groups. The Box's M test for hypothesis one ($F=5.3732$, $p<.0000$) and for hypothesis two ($F=6.3228$, $p<.0000$) indicate that the groups are from multivariate normal distributions and the discriminant analyses do not violate the assumption of multivariate normality (Norusis, 1990).

Tables 17 and 18 show the discriminant functions for the hypotheses. In the discriminant analyses, a linear combination of the independent variables was formed by maximizing the ratio of between-group sums of squares to within-groups sums of squares for the best combination of predictor variables (Tabachnick & Fidell, 1983).

Table 17

Discriminant Function for Pain and Non-Pain Samples

Eigenvalue	.94125
Percent of Variance	100.00
Cumulative Percent	100.00
Canonical Correlation	.6963239
Wilks' lambda	.5151330
Chi-square	129.68
D.F.	5
Significance	.0000

Table 18

Discriminant Function for Chronic Pain PatientsWho Return to Work and Do Not Return to Work

Eigenvalue	1.90967
Percent of Variance	100.00
Cumulative Percent	100.00
Canonical Correlation	.8101346
Wilks' lambda	.3436819
Chi-square	102.00
D.F.	5
Significance	.0000

The eigenvalues are the ratios of between-group to within-group sums of squares. The large eigenvalues for both analyses are associated with "good" discriminant functions. The percent of variance and cumulative percent are always 100.00 for the two-group situation. The canonical correlation is a measure of the degree of association between the discriminant score and the groups (Tabachnick & Fidell, 1983). These canonical variates (.6963 for hypothesis one and .8101 for hypothesis two) indicate a relatively high degree of association between the discriminant function scores and group membership.

The small values of lambda (.5151 for hypothesis one and .3437 for hypothesis two) are associated with much variability between groups and little variance within the groups. Lambda is transformed to a variable which approximates a chi-square distribution (Norusis, 1990). For Table 17, a $X^2(5)$ of 129.68 with an observed significance level of .0000, it appears very unlikely that pain patients and non-pain individuals have the same means on the discriminant function. And likewise, for Table 18, a $X^2(5)$ of 102.00 with an observed significance level of .0000, it appears very unlikely that chronic pain patients who return to work and those who do not return to work have the same means on the discriminant function.

The next step in interpreting the discriminant functions was to examine the standardized discriminant function coefficients to determine how the variables define the function. The standardized coefficients for hypothesis one and two are displayed in Table 19 and 20.

Table 19

Standardized Discriminant Function Coefficients for Pain and Non-Pain Samples

	Function
TAS	.83375
ALN	.58931
EGC	-.51333
SI	-.26588
IA	.14970

Table 20

Standardized Discriminant Function Coefficients for Pain Patients Who Return to Work and Do Not Return to Work

	Function
TAS	.47427
ALN	.30816
EGC	.34311
IA	.13624
SI	.10764

In discriminating pain from non-pain individuals, alexithymia, alienation, and insecure attachment are positively related to group membership. Egocentricity and social alienation, however are inversely related to the function.

In discriminating pain patients who return to work from those who do not return to work, all predictor variables were positively related to group membership. There were no inverse relationships for hypothesis two.

Using the discriminant score, each case was then classified into one of the two groups (pain/non-pain for hypothesis one and return to work/non-return to work for hypothesis two). The probabilities for group membership are shown in Appendix F for hypothesis one and Appendix G for hypothesis two.

The group to which a case belongs is listed in the column labeled ACTUAL GROUP. The most likely group for a case based on the discriminant analysis (the group with the largest unknown, or posterior probability) is listed under the column labeled HIGHEST GROUP. Cases which are misclassified have an asterisks next to them. The next values listed are the probabilities of a case's discriminant score appearing if the case is a member of the "most likely group". See Appendix F and G for detailed information on the discriminant function.

These probabilities for predicting group membership are summarized in Table 21 for hypothesis one and Table 22 for hypothesis two. For each group (pain/non-pain, return to work/non-return to work) the number of correct and incorrect classifications are shown based on all predictor variables and the discriminant scores.

For hypothesis one, of 100 non-injured cases, 88 were predicted correctly to be members of the non-pain group (88%), while 12 (12%) were assigned incorrectly to the chronic pain group. Of the 100 chronic pain cases, 84 were predicted correctly to be members of the pain group (84%) while 16 (16%) were assigned incorrectly to the non-pain group. The percent of correctly classified cases was 86%.

Table 21

Classification Summary For Hypothesis One

Group	No. of Cases	Predicted Group Membership	
		Non-Pain	Pain
Non-Pain	100	88	12
		88%	12%
Pain	100	16	84
		16%	84%

Table 22

Classification Summary For Hypothesis Two

Group	No. of Cases	Predicted Group Membership	
		Return to Work	Non-Return to Work
Return to Work	52	46	6
		88.5%	11.5%
Non-Return	48	2	46
to Work		4.2%	95.8%

For hypothesis two, of the 52 pain patients who returned to work, 46 were predicted correctly to be members of the return to work group (88.5%), while 6 (11.5%) were assigned incorrectly to the non-return to work group. Of the 48 pain patients who did not return to work, 46 were predicted correctly to be members of the non-return to work group (95.8%), and 2 (4.2%) were assigned incorrectly to the return to work group. The percent of correctly classified cases was 92%.

In order to see how much the two dependent variables overlap and to examine the distribution of the discriminant scores, histograms of the discriminant scores were plotted for both hypotheses. The rows of 1's and 2's underneath the plots denote the group to which scores are assigned.

Symbols used in Plots

Symbol	Group	Label
1	1	Non-Injured
2	2	Injured

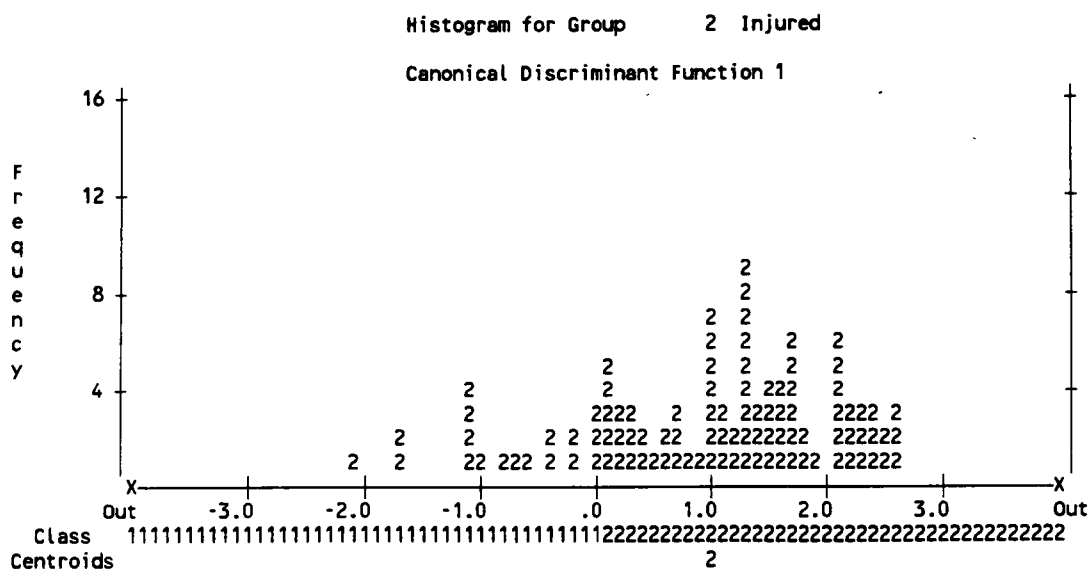
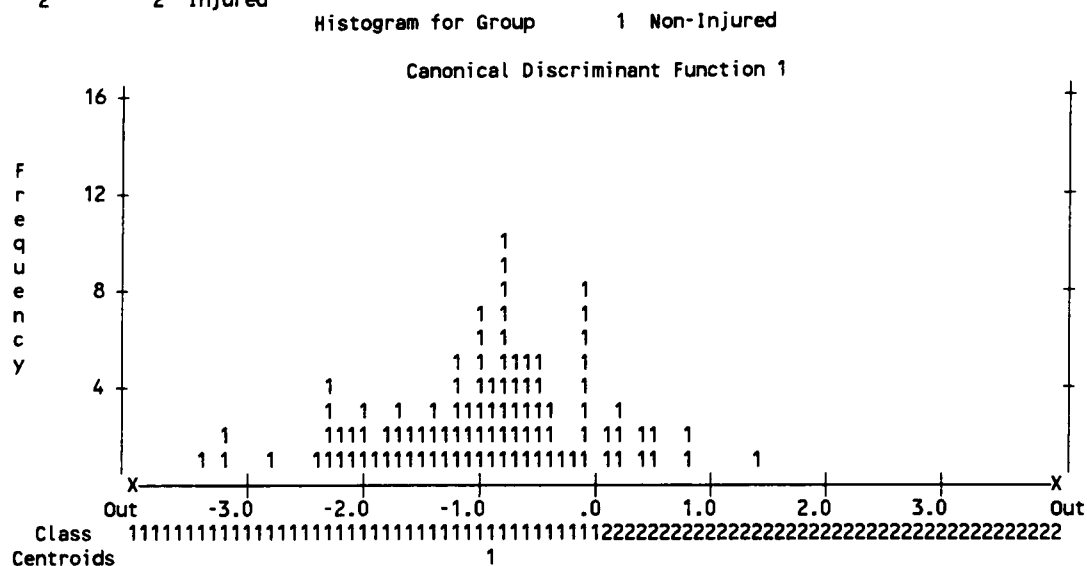


Figure 1

Histograms for Chronic Pain and Non-Pain Individuals

CHAPTER V

DISCUSSION

Chapter V is divided into four sections: (a) General Conclusions, (b) General Limitations, (c) Recommendations for Treatment, and (d) Recommendations for Future Research.

General Conclusions

From the data presented, two general conclusions can be drawn.

1. It appears that it is possible to predict with a high degree of accuracy whether a person is likely to develop chronic pain following an injury based on the independent variables. The data reflects that the variables contribute to the discriminant function in the following descending order: Alexithymia, Alienation, Egocentricity, Social Incompetence and Insecure Attachment.

Interpretations based on the discriminant function variable correlations and the standardized coefficients suggest that the pain and non-pain groups differ the most in alexithymia and alienation, with insecure attachment, while still significant, providing the least information to the function. Egocentricity and social isolation were inversely related to discriminating between pain and non-pain individuals indicating that the lower an individual scores on these subscales, the more it discriminates between pain and non-pain group membership.

Thus, based on the results of this study, it appears that people with chronic neck and back injuries are different from their non-pain peers in the way they relate to people and in the way they express their emotions. In regards to object relations and pain patient's internal representations of childhood relationships, the following interpretations are made. Individuals with pain have higher levels of distrust in relating to people (Aln), have less awareness or concern for others' feelings (Ego), feel little nervousness in interacting with others (SI), and have higher levels of sensitivity and insecurity (IA).

The most discriminating factor between pain and non-pain individuals is alexithymia, or the inability to identify and verbalize feelings and a tendency to fantasize. Based on the results of this study, patients with chronic neck and back pain are less likely to be able to identify their emotions and are more prone to use fantasy than non-pain individuals. By not expressing their feelings and fantasizing or internalizing their feelings, people appear more likely to have chronic neck and back pain following an injury.

2. It also appears to be possible to accurately predict whether a person will return to work following an injury based on the independent variables. The data reflects that the variables contribute to the discriminant function

for hypothesis two in the following descending order:
Alexithymia, Alienation, Egocentricity, Insecure
Attachment, and Social Incompetence.

Interpretations based on this discriminant function variable correlations and the standardized coefficients suggests that pain patients who return to work and do not return to work differ the most in alexithymia, with social incompetence, while still significant providing the least information to the function. Thus, based on the results of this sample of pain patients, it appears that people who return to work following an injury differ from their chronic pain peers in the way they express their emotions.

The most discriminating factor within pain patients is their inability to verbalize emotions and a basic lack of trust in relationships. Based on the results of this study, individuals who feel alienated from others and have relationships which are unstable and disappointing are less likely when injured to return to a productive work life.

In both hypotheses, insecure attachment and alienation were the most highly correlated subscales and accounted for the largest proportion of the variance within groups. This correlation replicates findings by Bell (1985) reflecting a relationship between interpersonal pain and extreme feelings of alienation.

This study confirmed psychodynamic thought regarding the impact of early childhood experiences on adult responses to stress. Ascencao (1992) found differences in levels of object relations and alexithymia between psychosomatic rheumatoid arthritis patients and healthy non-psychosomatic subjects. The current study added to this differentiation by the addition of chronic neck and back injured patients on levels of object relations and alexithymia.

By investigating how object relations and alexithymia affect recovery from an injury, the results of this study were similar to the results of Julkunen (1988). Hostility and alexithymia were found to be negative intervening variables modifying a chronic back pain rehabilitation intervention. While previous research used disability at 1 year as a measure of treatment failure, the current study used return to work at six months as a measure of treatment success.

This study goes beyond previous research in two ways. First, this study is different than previous research in its investigation of chronic neck and back pain patients on levels of object relations and alexithymia. Second, this study establishes how these variables affect a patient's response to injury, pain, and recovery, by comparing patient's who return to work versus those who do not.

General Limitations

There are several limitations in this study which prevent it from providing conclusive evidence regarding the relationship between object relations, alexithymia, chronic pain patients and non-pain individuals. First, the defining characteristic of the chronic pain sample was blue-collar workers, which cannot be generalized to represent all chronic pain patients. For example, someone in a white-collar job who sustains a sports injury and develops chronic pain cannot be predicted to return to work or not based on this sample of chronic pain patients.

Second, the type of injury sustained by the pain subjects limits generalizability. The majority of these injuries involved pain in the upper extremities, neck, shoulders, and back. The most common diagnosis for the pain group was myofascial pain, which cannot be generalized for rheumatoid arthritis, reflex sympathetic dystrophy, or other chronic pain conditions.

A third limitation of the study was the fact that the independent samples differed significantly on the demographic variable of gender. Because a disproportionate number of subjects in the pain sample were men, it is unknown how this may have affected the return to work measure of success.

Fourth, the return to work measure, while it has been used in previous research as a measure of treatment success, has unknown effects on the outcome results. For example, the chronic pain patients who returned to work, may have had jobs which were more enjoyable, or rewarding, than the chronic pain patients who did not return to work.

Another limitation of this study is the influence of the confounding variables on the measure of return to work for the chronic pain sample. Because the chronic pain sample included a relatively equal number of patients who returned to work (52) versus those who did not (48), the discriminant analysis statistic was more powerful and did not violate the assumptions for multivariate analysis. However, whether an individual returns to work following an injury is not limited to alexithymia and four levels of object relations.

There are at least two confounding variables which are suspected to have influenced the pain sample. For example, the length of time between the pain patient's injuries and entry into the treatment program was 1.5 years. It has already been established that pain patients who do not return to work at 6 months following an injury are unlikely to return to work full time (Beals & Hickman, 1972; Seres et al, 1983). Secondly, 10% of the pain

patients were currently in litigation regarding their injuries, which is known to negatively affect the likelihood of returning to work (Kinney & Brin, 1992).

The lack of validity measures available on the BORI is a final imitation of this study. While the BORI has been documented to be used in studies representing personality disorders (Bell 1985; Bell et al, 1986) there was no available documentation of construct validity on the subscales. Statements regarding the results of the present study need to be confined to alexithymia and object relations as they were measured by the TAS and the BORI.

Recommendations for Treatment

This study has several implications for treatment interventions with pain patients. Because it appears possible to predict which patients will benefit from a traditional work hardening program and return to the work force, these patients can be offered individualized treatment regimes based on their measures of object relations and alexithymia. Also, because it appears possible to discriminate patients who will not return to the workforce following treatment, alternative methods of working with these patients can be developed to facilitate their adjustment to their injury and to cope with pain.

Treatment facilities may wish to incorporate a psychodynamically oriented treatment group for patients

who are predicted not to return to work to identify how their internal experience of pain is affecting their coping resources and their adjustment to their injury. It appears that for some chronic pain patients, their childhood relationships have affected their ability to process their feelings and their abilities to relate to people in such a way that coping with a chronic pain condition is difficult. By identifying who these pain patients are when they show up for medical and psychological interventions, professionals working with chronic pain patients can better focus on helping treat the unmet needs of these patients.

In the age of managed care, it is increasingly necessary to reduce costs of treatment. Because worker's compensation claims are a costly subgroup of the labor force, reducing treatment costs is attractive to health management organizations. By predicting which patients will benefit from treatment and which patients will not, money spent on treating chronic pain conditions can be reduced and patients can return to a productive lifestyle more quickly.

Recommendations for Future Research

Because this study indicated significant differences in pain and non-pain individuals and in pain patients who return to work and do not return to work based on object relations and alexithymia, it is important to replicate

these findings. In order to generalize these findings it is recommended that this study be conducted in other treatment settings and across other chronic pain diagnoses.

It is also necessary to further investigate neck and back injuries from other socioeconomic levels and to use other means of assessing coping (other than returning to work). Because object relations imply the importance of childhood relationships in developing coping resources in life, other measures of investigating childhood experiences are important in making statements about how pain patients are affected by object relations.

Future research directions need to address the many unresolved issues affecting the chronic pain patient.

Some of these issues are:

Are poor object relations correlated to other chronic pain conditions?

What are the common childhood factors which influence personality development and the inability to effectively cope with chronic pain in adulthood?

What is the value and meaning of work to the chronic pain patient?

Which factors influence motivation to work, and how do we accurately assess them?

Is motivation to work different for pain patients
and non-pain individuals?

How should pain treatment centers select patients?

Does intervention early in the chronic pain
syndrome affect outcome?

What is the role of the legal system in fostering
pain related disability and compensation?

Does this society encourage rehabilitation or
disability?

Do certain patients assume the "disabled role"
regardless of intervention? (Aronoff & McAlary,
1992).

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APPENDICES

APPENDIX A
INFORMED CONSENT FORMS

APPENDIX A.1
SAMPLE INFORMED CONSENT FORM FOR CHRONIC PAIN SUBJECTS

You have been invited to participate in a study investigating chronic pain and rehabilitation. Your part in this research will consist of answering questions about chronic pain and completing two pencil and paper tasks. The entire process will last approximately thirty to forty-five minutes.

Since your participation in this research involves the confidential responses to questionnaires, there should be no risk or discomfort on your part. In the event that you should have any concerns or experience any distress as a result of responding to the questionnaires, there will be professional staff available at Behavioral Medicine Institute to answer any questions, or address any concerns. Your participation is completely voluntary, and you may withdraw from the study at any time without penalty or prejudice.

Your identity will be confidential and in no way be revealed to anyone except the researchers at any time. This form will remain in a locked filing cabinet. Any data collected from this study will be reported as group data and, in no way will your name be associated with this study in publication.

If you are interested in the results, or have any further questions concerning this study or your participation, you may contact Elizabeth Krause or Dr. Marla Peterson at 974-5131, 108 Claxton Education Building, University of Tennessee, Main Campus.

I have read and I understand this explanation of the research project and I have had my questions regarding the study and/or my participation in it answered to my satisfaction. I voluntarily agree to participate.

Signature

Date

APPENDIX A.2
SAMPLE INFORMED CONSENT FORM FOR NON- PAIN SUBJECTS

You have been invited to participate in a study investigating how people in similar jobs are alike and different. Your part in this research will consist of answering questions about you and your health and completing two pencil and paper tasks. The entire process will last approximately thirty to forty-five minutes.

Since your participation in this research involves the confidential responses to questionnaires, there should be no risk or discomfort on your part. In the event that you should have any concerns or experience any distress as a result of responding to the questionnaires, there will be professional staff available at The University of Tennessee Department of Educational and Counseling Psychology to answer any questions, or address any concerns. Your participation is completely voluntary, and you may withdraw from the study at any time without penalty or prejudice.

Your identity will be confidential and in no way be revealed to anyone except the researchers at any time. This form will remain in a locked filing cabinet. Any data collected from this study will be reported as group data and, in no way will your name be associated with this study in publication.

If you are interested in the results, or have any further questions concerning this study or your participation, you may contact Elizabeth Krause or Dr. Marla Peterson at 974-5131, 108 Claxton Education Building, University of Tennessee, Main Campus.

I have read and I understand this explanation of the research project and I have had my questions regarding the study and/or my participation in it answered to my satisfaction. I voluntarily agree to participate.

Signature

Date

APPENDIX B
SOCIODEMOGRAPHIC INFORMATION SHEETS

APPENDIX B.1
SAMPLE CHRONIC PAIN SUBJECT SOCIODEMOGRAPHIC FORM

Please answer each question.

1. Gender: ☐ Male
 ☐ Female
2. Age: _____
3. Ethnicity: ☐ Asian
 ☐ Black
 ☐ Hispanic
 ☐ White
4. Marital Status: ☐ Married
 ☐ Divorced
 ☐ Divorced and Re-Married
 ☐ Single
5. Current annual income: ☐ < \$20,000
 ☐ \$20,000 - \$35,000
 ☐ \$35,000 - \$50,000
 ☐ \$50,000 - \$80,000
 ☐ > \$80,000
6. What kind of injury do you have? (neck, back, other)

7. What type of work were you doing when you were injured? _____
8. What was the date of your injury? _____
9. Do you have a lawyer regarding your injury? _____
10. Have you had any other health problems?

11. How old were you when you first started working? _____
12. How many doctors have you seen since the injury? _____
13. On a scale from 1 - 100, with 1 being the smallest amount of pain you have and 100 being the most severe pain you have, how much pain do you have on most days? (give a number between 1 and 100) _____

APPENDIX B.2
SAMPLE NON-PAIN SUBJECT SOCIODEMOGRAPHIC FORM

1. Gender: ☐ Male
 ☐ Female
2. Age: _____
3. Ethnicity: ☐ Asian
 ☐ Black
 ☐ Hispanic
 ☐ White
4. Marital Status: ☐ Married
 ☐ Divorced
 ☐ Divorced and Re-Married
 ☐ Single
5. Current annual income: ☐ < \$20,000
 ☐ \$20,000 - \$35,000
 ☐ \$35,000 - \$50,000
 ☐ \$50,000 - \$80,000
 ☐ > \$80,000
6. Have you ever been injured and unable to
work? _____
7. What type of work are you currently doing?

8. Do you have any health problems, and if so, what are
they?

9. How old were you when you first started working?

10. Are you in any daily physical pain? _____

APPENDIX C
BELL OBJECT RELATIONS INVENTORY (BORI)

APPENDIX C
BELL OBJECT RELATIONS INVENTORY

Answer according to your most recent experience. Please answer all questions.

1. I have at least one stable and satisfying relationship.
true false
2. If someone dislikes me, I will always try harder to be nice to that person.
true false
3. I would like to be a hermit forever.
true false
4. I may withdraw and not speak to anyone for weeks at a time.
true false
5. I usually end up hurting those closest to me.
true false
6. People treat me more like a child than an adult.
true false
7. If someone whom I have known well goes away, I may miss that person.
true false
8. I can deal with disagreements at home without disturbing family relationships.
true false
9. I am extremely sensitive to criticism.
true false
10. Exercising power over other people is a secret pleasure of mine.
true false
11. At times I will do almost anything to get my way.
true false
12. When a person close to me is not giving me his or her full attention, I often feel hurt and rejected.
true false
13. If I become close with someone and he or she proves untrustworthy, I may hate myself for the way things turned out.
true false
14. It is hard for me to get close to anyone.
true false
15. My sex life is satisfactory.
true false
16. I tend to be what others expect me to be.
true false
17. No matter how bad a relationship may get, I will hold onto it.
true false
18. I have no influence on anyone around me.
true false

19. People do not exist when I do not see them.
true false
20. I've been hurt a lot in life.
true false
21. I have someone with whom I can share my innermost feelings and who shares such feelings with me.
true false
22. No matter how hard I try to avoid them, the same difficulties crop up in my most important relationships.
true false
23. I yearn to be completely "at one" with someone.
true false
24. In relationships, I am not satisfied unless I am with the other person all of the time.
true false
25. I am a very good judge of other people.
true false
26. Relationships with people of the opposite sex always turn out the same with me.
true false
27. Others frequently try to humiliate me.
true false
28. I generally rely on others to make my decisions for me.
true false
29. I am usually sorry that I trusted someone.
true false
30. When I am angry with someone close to me, I am able to talk it through.
true false
31. Manipulating others is the best way to get what I want.
true false
32. I often feel nervous when I am around members of the opposite sex.
true false
33. I often worry that I will be left out of things.
true false
34. I feel that I have to please everyone or else they might reject me.
true false
35. I shut myself up and don't see anyone for months at a time.
true false
36. I am sensitive to possible rejection by important people in my life.
true false
37. Making friends is not a problem for me.
true false
38. I do not know how to meet or talk with members of the opposite sex.

- | | | |
|-----|--|-------|
| | true | false |
| 39. | When I cannot make someone close to me do what I want, I feel hurt or angry. | |
| | true | false |
| 40. | It is my fate to lead a lonely life. | |
| | true | false |
| 41. | People are never honest with each other. | |
| | true | false |
| 42. | I put a lot into relationships and get a lot back. | |
| | true | false |
| 43. | I feel shy about meeting or talking with members of the opposite sex. | |
| | true | false |
| 44. | The most important thing to me in a relationship is to exercise power over the other person. | |
| | true | false |
| 45. | I believe that a good mother should always please her children. | |
| | true | false |

APPENDIX D
TORONTO ALEXITHYMIA SCALE (TAS)

APPENDIX D TORONTO ALEXITHYMIA SCALE

Using the scale provided as a guide, indicate how much you agree or disagree with each of the following statements by placing an X in the appropriate place.

	Strongly disagree 1	Moderately disagree 2	Neither disagree nor agree 3	Moderately agree 4	Strongly agree 5
1. When I cry I always know why.	—	—	—	—	—
2. Daydreaming is a waste of time.	—	—	—	—	—
3. I wish I were not so shy.	—	—	—	—	—
4. I am often confused about what emotion I am feeling.	—	—	—	—	—
5. I often daydream about the future.	—	—	—	—	—
6. I seem to make friends as easily as others do.	—	—	—	—	—
7. Knowing the answers to problems is more important than knowing the reasons for the answers.	—	—	—	—	—
8. It is difficult for me to find the right words for my feelings.	—	—	—	—	—
9. I like to let people know where I stand on things.	—	—	—	—	—
10. I have physical sensations that even doctors don't understand.	—	—	—	—	—
11. It's not enough for me that something gets the job done; I need to know why and how it works.	—	—	—	—	—
12. I'm able to describe my feelings easily.	—	—	—	—	—
13. I prefer to analyze problems rather than just describe them.	—	—	—	—	—
14. When I am upset, I don't know if I am sad, frightened, or angry.	—	—	—	—	—
15. I use my imagination a great deal.	—	—	—	—	—
16. I spend much time daydreaming whenever I have nothing else to do.	—	—	—	—	—
17. I am often puzzled by sensations in my body.	—	—	—	—	—
18. I daydream rarely.	—	—	—	—	—
19. I prefer to just let things happen rather than to understand why they turned out that way.	—	—	—	—	—

- | | | | | | |
|---|---|---|---|---|---|
| 20. I have feelings that I can't quite identify. | — | — | — | — | — |
| 21. Being in touch with emotions is essential. | — | — | — | — | — |
| 22. I find it hard to describe how I feel about people. | — | — | — | — | — |
| 23. People tell me to describe my feelings more. | — | — | — | — | — |
| 24. One should look for deeper explanations. | — | — | — | — | — |
| 25. I don't know what's going on inside me. | — | — | — | — | — |
| 26. I often don't know why I am angry. | — | — | — | — | — |
-

APPENDIX E
JOB TITLES FOR SUBJECTS

APPENDIX E.1

Job Titles for Pain Patients

Auto Repair	3.4%
Cabinet Maker	1.1%
Certified Nursing Assistant	6.9%
Construction	17.2%
Crane Operator	2.3%
Electrician	2.3%
Food Services	6.9%
Home Health Aid	2.3%
Housekeeping	5.7%
Insulation	2.3%
Landscaping	1.1%
Maintenance	3.4%
Movers	3.4%
Nurse	2.3%
Painter	3.4%
Plumber	1.1%
Supply Clerk	1.1%
Wood Working	1.1%

APPENDIX E.2

Job Titles for Non-Pain Sample

Assembly/Factory Worker	2.1%
Brick Layer	2.1%
Bull Dozer/Heavy Equipment Operator	4.1%
Certified Nursing Assistant	16.5%
Construction	8.2%
Dietary Aid	22.7%
Furniture Mover	1.0%
Garbage Collector	1.0%
Home Health Aid	3.1%
Housekeeping	10.3%
Landscaper	1.0%
Lawn Service	1.0%
Maintenance	9.3%
Mechanic	2.1%
Secretarial	2.1%
Truck Driver	3.1%

APPENDIX F
DISCRIMINANT CLASSIFICATION OUTPUT FOR
HYPOTHESIS ONE

Case Number	Mis Val	Sel	Actual Group	Highest Group	Probability P(D/G)	P(G/D)	2nd Highest Group	P(G/D)	Discriminant Scores...
1			2	2	.9403	.8817	1	.1183	1.0403
2			2 **	1	.7606	.7816	2	.2184	-.6606
3			2	2	.3486	.5136	1	.4864	.0281
4			2	2	.4574	.6056	1	.3944	.2222
5			2	2	.1993	.9872	1	.0128	2.2488
6			2 **	1	.2421	.9840	2	.0160	-2.1352
7			2	2	.7650	.7836	1	.2164	.6664
8			2 **	1	.5646	.6795	2	.3205	-.3893
9			2	2	.3628	.5267	1	.4733	.0554
10			2	2	.3790	.5412	1	.4588	.0856
11			2	2	.3735	.5363	1	.4637	.0754
12			2	2	.7254	.7660	1	.2340	.6141
13			2 **	1	.4495	.9652	2	.0348	-1.7216
14			2	2	.3790	.5412	1	.4588	.0856
15			2	2	.6580	.9381	1	.0619	1.4080
16			2	2	.5720	.9505	1	.0495	1.5304
17			2	2	.7911	.7945	1	.2055	.7004
18			2	2	.4781	.9621	1	.0379	1.6747
19			2	2	.5060	.9588	1	.0412	1.6304
20			2 **	1	.7418	.7734	2	.2266	-.6358
21			2	2	.2586	.9828	1	.0172	2.0951
22			2 **	1	.4495	.9652	2	.0348	-1.7216
23			2 **	1	.4688	.6142	2	.3858	-.2408
24			2	2	.7031	.7555	1	.2445	.5842
25			2 **	1	.9002	.8350	2	.1650	-.8399
26			2	2	.5611	.6774	1	.3226	.3842
27			2	2	.7355	.9252	1	.0748	1.3031
28			2	2	.9019	.8911	1	.1089	1.0885
29			2 **	1	.8641	.8997	2	.1003	-1.1365
30			2 **	1	.9873	.8692	2	.1308	-.9812
31			2	2	.8921	.8323	1	.1677	.8297
32			2	2	.3746	.5373	1	.4627	.0774
33			2	2	.4163	.5731	1	.4269	.1525
34			2	2	.2733	.9816	1	.0184	2.0609
35			2	2	.5231	.6527	1	.3473	.3268
36			2	2	.9901	.8685	1	.1315	.9778
37			2	2	.6119	.7077	1	.2923	.4579
38			2 **	1	.9283	.8847	2	.1153	-1.0552
39			2 **	1	.5536	.6726	2	.3274	-.3730

Case Number	Mis Val	Sel	Actual Group	Highest Probability Group	P(D/G)	P(G/D)	2nd Highest Group	P(G/D)	Discriminant Scores...
40			2	2	.1620	.9897	1	.0103	2.3637
41			2 **	1	.3485	.5134	2	.4866	-.0279
42			2	2	.1009	.9935	1	.0065	2.6057
43			2	2	.4646	.6111	1	.3889	.2341
44			2 **	1	.8698	.8985	2	.1015	-1.1293
45			2	2	.1110	.9929	1	.0071	2.5592
46			2 **	1	.9283	.8847	2	.1153	-1.0552
47			2	2	.7720	.7865	1	.2135	.6755
48			2	2	.9892	.8627	1	.1373	.9518
49			2 **	1	.4550	.6038	2	.3962	-.2183
50			2	2	.9300	.8842	1	.1158	1.0531
51			2	2	.4790	.9620	1	.0380	1.6733
52			2	2	.5965	.9471	1	.0529	1.4948
53			2	2	.5956	.9473	1	.0527	1.4960
54			2	2	.1236	.9921	1	.0079	2.5051
55			2	2	.1854	.9881	1	.0119	2.2896
56			2	2	.1009	.9935	1	.0065	2.6057
57			2	2	.2577	.9829	1	.0171	2.0971
58			2	2	.6469	.9398	1	.0602	1.4233
59			2	2	.7122	.9293	1	.0707	1.3342
60			2	2	.4334	.9669	1	.0331	1.7487
61			2	2	.7458	.9234	1	.0766	1.2895
62			2	2	.7409	.9243	1	.0757	1.2960
63			2	2	.3410	.5064	1	.4936	.0132
64			2	2	.4533	.9648	1	.0352	1.7152
65			2	2	.1232	.9921	1	.0079	2.5066
66			2	2	.5034	.6392	1	.3608	.2962
67			2	2	.5329	.9555	1	.0445	1.5888
68			2	2	.8455	.9038	1	.0962	1.1602

Case Number	Mis Val	Sel	Actual Group	Highest Group	Probability P(D/G)	P(G/D)	2nd Highest Group	P(G/D)	Discriminant Scores...
69			2	2	.7576	.9213	1	.0787	1.2739
70			2	2	.2691	.9820	1	.0180	2.0703
71			2	2	.9960	.8646	1	.1354	.9602
72			2	2	.9548	.8779	1	.1221	1.0220
73			2	2	.4088	.9695	1	.0305	1.7913
74			2	2	.2422	.9840	1	.0160	2.1349
75			2	2	.1746	.9888	1	.0112	2.3228
76			2	2	.7581	.9212	1	.0788	1.2733
77			2	2	.9589	.8769	1	.1231	1.0169
78			2	2	.4640	.9636	1	.0364	1.6976
79			2	2	.6329	.9419	1	.0581	1.4429
80			2	2	.8608	.9005	1	.0995	1.1407
81			2	2	.9661	.8750	1	.1250	1.0078
82			2	2	.7859	.9159	1	.0841	1.2369
83			2	2	.1645	.9895	1	.0105	2.3555
84			2	2	.7678	.9194	1	.0806	1.2606
85			2	2	.2038	.9868	1	.0132	2.2360
86			2	2	.6214	.9436	1	.0564	1.4592
87			2	2	.4805	.6228	1	.3772	.2598
88			2	2	.5364	.9551	1	.0449	1.5836
89			2	2	.9870	.8620	1	.1380	.9490
90			2	2	.5791	.6884	1	.3116	.4106
91			2	2	.3446	.9756	1	.0244	1.9105
92			2	2	.4825	.9616	1	.0384	1.6676
93			2	2	.3957	.9708	1	.0292	1.8147
94			2	2	.1422	.9910	1	.0090	2.4331
95			2	2	.2536	.9832	1	.0168	2.1071
96			2	2	.7471	.9232	1	.0768	1.2878
97			2	2	.1709	.9891	1	.0109	2.3348
98			2	2	.5501	.9534	1	.0466	1.5630
99			2	2	.2230	.9855	1	.0145	2.1839
100			2	2	.7650	.9199	1	.0801	1.2643
101			1	1	.7550	.9217	2	.0783	-1.2774
102			1	1	.9553	.8526	2	.1474	-.9092
103			1	1	.7997	.7980	2	.2020	-.7116
104			1	1	.0171	.9985	2	.0015	-3.3505
105			1	1	.9636	.8756	2	.1244	-1.0110
106			1	1	.7466	.7755	2	.2245	-.6421
107			1	1	.5646	.6795	2	.3205	-.3893
108			1	1	.6421	.7244	2	.2756	-.5006

Case Number	Mis Val	Sel	Actual Group	Highest Group	Probability P(D/G) P(G/D)	2nd.Highest Group P(G/D)	Discriminant Scores...
109			1	1	.8024 .9127	2 .0873	-1.2156
110			1 **	2	.5570 .6747	1 .3253	.3780
111			1	1	.7693 .9191	2 .0809	-1.2586
112			1	1	.8250 .9081	2 .0919	-1.1865
113			1	1	.9280 .8441	2 .1559	-.8749
114			1	1	.2421 .9840	2 .0160	-2.1352
115			1	1	.9833 .8704	2 .1296	-.9862
116			1	1	.9325 .8456	2 .1544	-.8806
117			1 **	2	.4094 .5673	1 .4327	.1403
118			1	1	.8267 .9077	2 .0923	-1.1842
119			1	1	.4298 .9673	2 .0327	-1.7548
120			1	1	.1769 .9887	2 .0113	-2.3157
121			1	1	.1863 .9880	2 .0120	-2.2868
122			1	1	.9503 .8791	2 .1209	-1.0277
123			1	1	.9803 .8601	2 .1399	-.9406
124			1	1	.9170 .8874	2 .1126	-1.0695
125			1 **	2	.5476 .6688	1 .3312	.3640
126			1 **	2	.8664 .8233	1 .1767	.7971
127			1	1	.7931 .7953	2 .2047	-.7030
128			1 **	2	.6197 .7121	1 .2879	.4691
129			1	1	.2924 .9801	2 .0199	-2.0182
130			1	1	.9926 .8636	2 .1364	-.9560
131			1 **	2	.4222 .5779	1 .4221	.1627
132			1	1	.8923 .8323	2 .1677	-.8299
133			1	1	.6694 .7387	2 .2613	-.5384
134			1	1	.4037 .5626	2 .4374	-.1303
135			1	1	.8048 .8000	2 .2000	-.7182
136			1 **	2	.6562 .7319	1 .2681	.5202

Case Number	Mis Val	Sel	Actual Group	Highest Probability Group	P(D/G)	P(G/D)	2nd Highest Group	P(G/D)	Discriminant Scores...
137			1	1	.5879	.6937	2	.3063	-.4235
138			1	1	.2423	.9840	2	.0160	-2.1346
139			1	1	.3829	.5446	2	.4554	-.0927
140			1 **	2	.8849	.8298	1	.1702	.8205
141			1	1	.4526	.9649	2	.0351	-1.7163
142			1 **	2	.6485	.9396	1	.0604	1.4212
143			1	1	.2298	.9850	2	.0150	-2.1663
144			1	1	.0598	.9959	2	.0041	-2.8479
145			1	1	.9049	.8366	2	.1634	-.8458
146			1	1	.6179	.7111	2	.2889	-.4665
147			1	1	.2868	.9805	2	.0195	-2.0305
148			1	1	.5006	.6372	2	.3628	-.2917
149			1	1	.1502	.9905	2	.0095	-2.4043
150			1	1	.7862	.7925	2	.2075	-.6941
151			1	1	.8119	.9108	2	.0892	-1.2033
152			1	1	.9873	.8692	2	.1308	-.9812
153			1	1	.8382	.8130	2	.1870	-.7612
154			1	1	.0253	.9979	2	.0021	-3.2024
155			1	1	.6342	.7201	2	.2799	-.4895
156			1	1	.8948	.8332	2	.1668	-.8331
157			1	1	.3761	.5387	2	.4613	-.0803
158			1	1	.7903	.7942	2	.2058	-.6994
159			1	1	.5615	.9519	2	.0481	-1.5459
160			1	1	.7261	.7663	2	.2337	-.6150
161			1	1	.8366	.8124	2	.1876	-.7591
162			1	1	.9040	.8363	2	.1637	-.8447
163			1	1	.7423	.7736	2	.2264	-.6366
164			1	1	.4610	.9640	2	.0360	-1.7025
165			1	1	.8119	.9108	2	.0892	-1.2033
166			1	1	.8574	.8201	2	.1799	-.7856
167			1	1	.4688	.6142	2	.3858	-.2408
168			1	1	.4951	.9601	2	.0399	-1.6476
169			1	1	.4061	.9698	2	.0302	-1.7961
170			1	1	.1775	.9887	2	.0113	-2.3139
171			1	1	.2085	.9865	2	.0135	-2.2230
172			1	1	.8694	.8244	2	.1756	-.8009
173			1	1	.4495	.9652	2	.0348	-1.7216
174			1	1	.9934	.8676	2	.1324	-.9735
175			1	1	.3664	.5299	2	.4701	-.0621
176			1	1	.5587	.9522	2	.0478	-1.5501

Case Number	Mis Val	Sel	Actual Group	Highest Probability Group P(D/G) P(G/D)	2nd Highest Group P(G/D)	Discriminant Scores...
177			1	1 .6099 .7065	2 .2935	-.4551
178			1	1 .9079 .8376	2 .1624	-.8496
179			1	1 .0253 .9979	2 .0021	-3.2024
180			1 **	2 .4134 .5707	1 .4293	.1474
181			1 **	2 .4505 .6003	1 .3997	.2107
182			1	1 .3963 .5563	2 .4437	-.1171
183			1	1 .5840 .6914	2 .3086	-.4178
184			1	1 .6454 .9400	2 .0600	-1.4254
185			1	1 .4004 .5597	2 .4403	-.1243
186			1	1 .7231 .7649	2 .2351	-.6110
187			1	1 .8830 .8955	2 .1045	-1.1125
188			1	1 .8694 .8244	2 .1756	-.8009
189			1	1 .2926 .9801	2 .0199	-2.0177
190			1	1 .9487 .8795	2 .1205	-1.0296
191			1	1 .3943 .5546	2 .4454	-.1135
192			1 **	2 .4299 .5841	1 .4159	.1759
193			1	1 .6765 .9352	2 .0648	-1.3825
194			1	1 .3467 .9754	2 .0246	-1.9064
195			1	1 .1796 .9885	2 .0115	-2.3073
196			1	1 .3854 .5468	2 .4532	-.0973
197			1	1 .9283 .8847	2 .1153	-1.0552
198			1	1 .6469 .9398	2 .0602	-1.4234
199			1	1 .7247 .7656	2 .2344	-.6131
200			1	1 .6019 .9464	2 .0536	-1.4870

APPENDIX G
DISCRIMINANT CLASSIFICATION OUTPUT FOR
HYPOTHESIS TWO

Case Number	Mis Val	Sel	Actual Group	Highest Group	Probability P(D/G)	P(G/D)	2nd Highest Group	P(G/D)	Discriminant Scores...
1			2 **	1	.2387	.6278	2	.3722	-.1362
2			1	1	.3004	.9986	2	.0014	-2.3498
3			1	1	.5150	.8772	2	.1228	-.6633
4			1 **	2	.5584	.8953	1	.1047	.8386
5			1 **	2	.5494	.8919	1	.1081	.8253
6			1	1	.0069	1.0000	2	.0000	-4.0164
7			1 **	2	.8398	.9607	1	.0393	1.2217
8			1	1	.3212	.9984	2	.0016	-2.3063
9			1	1	.4135	.9975	2	.0025	-2.1321
10			1	1	.5635	.9952	2	.0048	-1.8920
11			1	1	.5765	.9949	2	.0051	-1.8729
12			1	1	.8021	.9883	2	.0117	-1.5650
13			1	1	.0188	1.0000	2	.0000	-3.6645
14			1	1	.5635	.9952	2	.0048	-1.8920
15			2	2	.4078	.9976	1	.0024	2.2516
16			2	2	.4027	.8112	1	.1888	.5871
17			1	1	.9812	.9755	2	.0245	-1.2907
18			2	2	.4375	.9972	1	.0028	2.2003
19			2	2	.8516	.9861	1	.0139	1.6110
20			1	1	.6613	.9930	2	.0070	-1.7524
21			2	2	.5350	.9957	1	.0043	2.0443
22			1	1	.0188	1.0000	2	.0000	-3.6645
23			1	1	.2832	.9988	2	.0012	-2.3875
24			2	2	.1814	.5224	1	.4776	.0876
25			1	1	.8467	.9616	2	.0384	-1.1210
26			2	2	.9484	.9727	1	.0273	1.3592
27			2	2	.3329	.7498	1	.2502	.4555
28			1	1	.7094	.9387	2	.0613	-.9417
29			1	1	.9652	.9742	2	.0258	-1.2708
30			1	1	.0870	.9998	2	.0002	-3.0260
31			2	2	.8956	.9838	1	.0162	1.5551
32			1	1	.4540	.8454	2	.1546	-.5657
33			1	1	.4330	.9973	2	.0027	-2.0985
34			2	2	.8576	.9629	1	.0371	1.2444
35			1	1	.7710	.9504	2	.0496	-1.0233
36			1	1	.4500	.8429	2	.1571	-.5589
37			1	1	.8967	.9838	2	.0162	-1.4442
38			1	1	.0758	.9998	2	.0002	-3.0899
39			1	1	.7469	.9904	2	.0096	-1.6370

Case Number	Mis Val	Sel	Actual Group	Highest Probability Group	P(D/G)	P(G/D)	2nd Highest Group	P(G/D)	Discriminant Scores...
40			2	2	.5787	.9949	1	.0051	1.9791
41			1	1	.7615	.9899	2	.0101	-1.6179
42			2	2	.8727	.9648	1	.0352	1.2637
43			1	1	.3964	.9977	2	.0023	-2.1625
44			1	1	.0659	.9998	2	.0002	-3.1537
45			2	2	.9230	.9822	1	.0178	1.5205
46			1	1	.0758	.9998	2	.0002	-3.0899
47			1	1	.3281	.7448	2	.2552	-.3364
48			1	1	.8379	.9867	2	.0133	-1.5190
49			1	1	.8563	.9628	2	.0372	-1.1333
50			2	2	.7443	.9905	1	.0095	1.7501
51			2	2	.5163	.8778	1	.1222	.7748
52			2	2	.3718	.9980	1	.0020	2.3169
53			2	2	.4803	.9966	1	.0034	2.1297
54			2	2	.8386	.9867	1	.0133	1.6275
55			2	2	.6231	.9939	1	.0061	1.9153
56			2	2	.8727	.9648	1	.0352	1.2637
57			2	2	.6765	.9313	1	.0687	1.0067
58			2	2	.5186	.9960	1	.0040	2.0693
59			2	2	.9456	.9724	1	.0276	1.3556
60			2	2	.4008	.9976	1	.0024	2.2641
61			2	2	.2669	.9989	1	.0011	2.5340
62			1 **	2	.2154	.5883	1	.4117	.1851
63			1 **	2	.4234	.8259	1	.1741	.6233
64			1 **	2	.2478	.6420	1	.3580	.2681
65			1	1	.2559	.6542	2	.3458	-.1781
66			2	2	.6021	.9106	1	.0894	.9024
67			2 **	1	.4296	.8301	2	.1699	-.5246
68			2	2	.2477	.6419	1	.3581	.2678

Case Number	Mis Val	Sel	Actual Group	Highest Probability Group	P(D/G)	P(G/D)	2nd Highest Group	P(G/D)	Discriminant Scores...
69			1	1	.3121	.7273	2	.2727	-.3035
70			2	2	.4290	.9973	1	.0027	2.2149
71			2	2	.3727	.9980	1	.0020	2.3153
72			2	2	.2343	.6207	1	.3793	.2346
73			2	2	.3884	.8001	1	.1999	.5614
74			2	2	.9080	.9687	1	.0313	1.3083
75			2	2	.5928	.9076	1	.0924	.8891
76			1	1	.2802	.6883	2	.3117	-.2345
77			1	1	.8096	.9564	2	.0436	-1.0734
78			2	2	.7279	.9910	1	.0090	1.7718
79			2	2	.8894	.9842	1	.0158	1.5629
80			1	1	.9484	.9807	2	.0193	-1.3791
81			1	1	.8646	.9855	2	.0145	-1.4849
82			2	2	.5989	.9945	1	.0055	1.9499
83			2	2	.6431	.9227	1	.0773	.9605
84			1	1	.3045	.7186	2	.2814	-.2876
85			2	2	.4299	.8303	1	.1697	.6346
86			2	2	.7594	.9484	1	.0516	1.1177
87			1	1	.7578	.9481	2	.0519	-1.0060
88			2	2	.3514	.9982	1	.0018	2.3558
89			1	1	.8317	.9870	2	.0130	-1.5268
90			1	1	.8349	.9600	2	.0400	-1.1059
91			2	2	.2040	.9993	1	.0007	2.6940
92			2	2	.6128	.9941	1	.0059	1.9299
93			1	1	.6381	.9214	2	.0786	-.8440
94			2	2	.7120	.9915	1	.0085	1.7931
95			2	2	.7698	.9895	1	.0105	1.7165
96			1	1	.5607	.8962	2	.1038	-.7326
97			2	2	.7895	.9888	1	.0112	1.6908
98			1	1	.3193	.7354	2	.2646	-.3185
99			2	2	.6489	.9243	1	.0757	.9687
100			1	1	.4715	.8554	2	.1446	-.5943

VITA

Elizabeth West Krause began graduate school at Texas Tech in August 1989. She transferred to the University of Tennessee, Knoxville in January 1990 and obtained her Master's of Science Degree in Community Agency Counseling in May 1992, graduating with a 4.0 grade point average. She was accepted into the Ph.D. program in Counseling Psychology in August of 1991 and will be awarded the Doctor of Philosophy degree in August of 1995. She completed her Pre-Doctoral Internship at the Vanderbilt-V.A. Consortium in Professional Psychology and has accepted a Post-Doctoral Fellowship in Nashville, Tennessee.