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**MYERS-BRIGGS PERSONALITY TYPES
IN CHRONIC PAIN PATIENTS**

**A Thesis
Presented to the
Department of Psychology
and the
Faculty of the Graduate College
University of Nebraska**

**In Partial Fulfillment
of the Requirements for the Degree
Master of Arts
Major: Psychology
University of Nebraska at Omaha**

**by
Linda S. McKee-McAlpin**

December, 1990

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THESIS ACCEPTANCE

Acceptance for the faculty of the Graduate College,
University of Nebraska, in partial fulfillment of the
requirements for the degree of Master of Arts in
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Abstract

This study uses the Myers-Briggs Type Indicator to examine the possibility that there are personality types that are more likely to cope maladaptively, and experience the syndrome of chronic pain, when they are faced with an injury or pain which results in unexpected life changes.

The Chronic Pain sample in this study scored significantly higher than a Normal sample in their preference for Introversion, Sensing and Judging and were significantly more likely to be the personality types ISFJ or ISTJ.

This study also examines the relationship between MMPI depression scores and Myers-Briggs Introversion scores and the results tend to confirm earlier research which showed a correlation between the two. Chronic pain subjects who scored high on the MMPI depression scale when they were admitted to a four-week multidisciplinary Pain Management Center, scored significantly lower on depression as well as exhibiting a significant move toward Extraversion at the time of their discharge from treatment. Chronic pain subjects who were within the normal range for depression on admission did not exhibit a significant change on the Introversion/ Extraversion scale at the time of discharge. There was a significant shift toward lower

MMPI depression scores at the time of discharge for the chronic pain sample irrespective of whether or not they scored as preferring Introversion or Extraversion at the time of admission to treatment.

The results support the concept that there are personality types that are at higher risk to experience chronic pain syndrome when faced with an unexpected injury.

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**Myers-Briggs Personality Types
in Chronic Pain Patients**

Chronic pain is a major health problem. In 1983 Bonica (1986) showed that an estimated 90 million Americans experienced chronic pain, and that 60 million of these individuals were either partially or totally disabled. These numbers translate into 750 million lost workdays and an annual monetary cost of nearly \$70 billion (lost workdays, health care costs, compensation payments, litigation, and quackery). Thompson and Bynny (1989) consider persistent pain to be the most common chief complaint that motivates patients to see their primary care physician. They estimate that 32 million physician visits annually are for chronic low back pain and headaches. Crook (1984) found that within 31% of randomly-sampled households at least one member complained of pain on a regular basis.

Pain is generally recognized as a signal that the body tissues are being injured, or have been injured. In cases of acute injury, or life threatening disease this is an accurate message (Melzack, 1986, Sternbach, 1974). In cases of chronic benign pain, however, "...pain may persist for years after tissues have healed and damaged nerves have regenerated" (Melzack, 1986, p. 1).

Many specialists in the area of chronic pain

management differentiate between pain, suffering, pain behaviors and disability (Fordyce, 1988, Wilson, 1987).

Pain is usually thought of as the sensation arising from nociception ("mechanical, thermal, or chemical energy impinging on specialized nerve endings that in turn activate A-delta and C fibers, thus initiating a signal to the central nervous system that aversive events are occurring" (Fordyce, 1988, p. 278). But, as Fordyce points out, this definition is oversimplified and does not account for pain that is felt in the absence of nociception (such as phantom limb pain) nor does it explain how nociception can occur and not be felt (such as the soldier wounded in battle who is unaware of his wound for up to several hours).

Suffering refers to the emotional response to pain. According to Wilson (1987), suffering implies that an adverse meaning is attributed to the perception of pain. Fordyce (1988) states that "events perceived to indicate probable or possible threat or loss are likely to elicit suffering behaviors" (p. 278). He stresses the anticipatory nature of suffering.

Pain behaviors are the responses of an individual to pain or suffering. Pain behaviors may originate as a response to nociception or they may arise for other reasons. Fordyce (1988) points out that these behaviors are a result of "...prior experience, expectancies and

perceived or anticipated consequences..." (p. 278). Melzack (1986) states that the experience of pain is "highly personal, variable ...[and] is influenced by cultural learning, the meaning of the situation, attention, and other cognitive activities" (p. 1). Similarly, Brena (1983) argues that "...pain involves an interplay between the physical sensations and their emotional and cognitive interpretations. Each individual is prone to view the painful experience... ..according to his/her own personality, feelings and philosophy of life" (p. 3).

Disability can be defined as the inability to fulfill an appropriate role in life (Feuerstein, 1989). Pain behaviors continuing over a prolonged period of time can lead to disability.

Chronic Pain Syndrome. In some individuals what begins as an acute injury with corresponding nociception, can, through suffering and pain behaviors that continue long after the tissue damage has healed, develop into the syndrome of chronic pain. Fordyce (1988) in looking at individuals with low back injury found that about 85% returned to essentially normal functioning within a few days or weeks. "The other 15% continued to suffer, exhibit pain behaviors, and became increasingly disabled despite no findings of major structural damage." The syndrome of chronic pain is a

psycho-physiological illness. Variables other than tissue damage that have been identified as contributing to the ongoing suffering of chronic pain patients include a tendency toward hypochondriasis and secondary gain (monetary benefits, being legitimately relieved of a stressful work situation or getting more attention at home, are examples).

Personality Inventories and Chronic Pain

Minnesota Multiphasic Personality Inventory (MMPI).

The MMPI is probably the most widely used personality test referred to in the literature dealing with chronic pain patients, who frequently show elevations on the hypochondriasis, depression and hysteria scales (Chapman, 1983, Sternbach, 1974, Merskey, 1987).

Chapman (1983) and Merskey (1987) point out that the MMPI is standardized on the basis that no physical illness is present and that anyone with a physical illness or problem could answer the questions truthfully and end up with elevations on the hypochondriasis scale. This circumstance could be incorrectly interpreted as meaning that the patient is psychologically ill.

Furthermore, a number of items composing the hysteria scale are also found on the hypochondriasis scale.

Consequently, if the hypochondriasis scale is elevated, it is likely that the hysteria scale will be elevated as well (Merskey, 1987). It is also known that persistent

pain over time can change an individual's temperament (Merskey, 1987). Frequently chronic pain patients score high on the 'lie' scale of the MMPI. This is often interpreted as defensiveness, when in reality, the patients "...may have had very good or effective premorbid personalities..." (Merskey, 1987, p. 144) and are accurately reporting how badly things have become since the onset of their physical problem. On the other hand, high lie scores, as well as high hysteria and hypochondriasis scores are often viewed as reflecting an active use and dependence on the defense mechanism of repression. Chronic pain, especially associated with an apparent lack of physical causes, may well signal the presence of a hysterical personality, the cornerstone of which is known to be the repression defense.

Myers-Briggs Type Indicator. The present study will use the Myers-Briggs Type Indicator in an effort to determine if there is a certain personality type, or preferences, over-represented among a sampling of patients who have developed the syndrome of chronic pain.

Unlike the MMPI, the Myers-Briggs Type Indicator is not designed to measure pathology. It is a self-report inventory designed to measure an individual's preferred way of processing information and interacting with the world. It is based on Carl Jung's theory (Carlyn, 1977,

McCaulley, 1981, Myers & McCaulley, 1985) of psychological types. According to Myers and McCaulley in the Manual for the Myers-Briggs Type Indicator (1985), "the essence of the theory is that much seemingly random variation in behavior is actually quite orderly and consistent..." (p. 1).

The Myers-Briggs Type Indicator consists of four indices that are most typically scored and reported as dichotomous scores. The Manual also provides a method for translating the scores into continuous scores if that is desired for research purposes. The four indices are: Extraversion - Introversion, Sensation- Intuition, Thinking - Feeling and Judgment - Perception. "Every person is assumed to use both poles of each of the four preferences, but to respond first or most often with the preferred functions or attitudes...analogous to right-handedness or left-handedness...[where] one expects to use both the right and the left hands, even though one reaches first with the hand one prefers" (Myers & McCaulley, 1985, p. 3). "The preferences affect not only what people attend to in any given situation, but also how they draw conclusions about what they perceive" (Myers & McCaulley, 1985, p. 2).

The Extraversion - Introversion index is designed to measure an individual's orientation, or attitude, toward life. Extraverted individuals are more outer

world oriented, tend to focus their perception and judgment on the outer world of people and objects, tend to be action oriented and have a tendency to get caught up in whatever is going on around them (Carlyn, 1977, Myers & McCaulley, 1985). "In the Extraverted attitude, attention seems to flow out - to be drawn out - to the objects and people of the environment. There is a desire to act on the environment, to affirm its importance, to increase its effect" (McCaulley, 1981, p. 297). Introverted individuals tend to be primarily oriented towards the inner world of concepts and ideas (Carlyn, 1977, Myers & McCaulley, 1985). "In the introverted attitude, energy seems to flow from the object back to the subject, who conserves this energy by consolidating it within his own position" (McCaulley, 1981, p. 297).

The Sensing - Intuition index is designed to measure an individual's preferred way of perceiving. According to Carlyn (1977), McCaulley (1981) and Myers (1985), individuals who prefer Sensing tend to perceive the world directly through their sense-organs. They notice concrete facts and practical details and are aware of what exists. Individuals who perceive the world through the process of Intuition, prefer to function with theories and abstractions. They see relationships and inferred meanings, and perceive

possibilities by way of insight or the unconscious (Carlyn, 1977, McCaulley, 1981, Myers & McCaulley, 1985).

The Thinking - Feeling index is designed to measure an individual's preferred way of judgment or decision making. Individuals who are Thinking oriented tend to make decisions based on logic and reason, whereas individuals who are Feeling oriented tend to make decisions based on personal or social values (Carlyn, 1977, Myers & McCaulley, 1985). Thinking individuals tend to analyze facts and organize information in an impersonal manner. Feeling individuals typically are interested in understanding other people's feelings and tend to develop a sensitivity to what matters to people (McCaulley, 1981).

The Judging - Perceptive index is designed to measure the primary process individuals use when they are dealing with the outside world. Judging types tend to be organized, and live in an orderly, planned way. They like to regulate life and control it as much as possible (Carlyn, 1977). Perceptive types tend to go through life in a more flexible, spontaneous fashion. They are typically curious, open-minded, and aim to understand life and adapt to it (Carlyn, 1977). Further, an individual who prefers Judging "has reported a preference for using a judgment process

(either thinking or feeling) for dealing with the outer world" (Myers & McCaulley, 1985, p. 2). Thinking or Feeling (whichever they scored highest on) will be considered to be their Dominant function. An individual who reports a preference for perception will tend to use either Sensing or Intuition in dealing with the outer world, and thus either Sensing or Intuition will be their Dominant function (McCaulley, 1981, Myers & McCaulley, 1985).

According to McCaulley (1981), "an essential element of type theory is that the different preferences interact. Each of the dichotomies modifies the effects of the others in predictable ways" (p. 314). Through the various combinations of preferences, sixteen personality types are possible. The sixteen possible personality types are not evenly distributed in the population. Based on data she had collected, Myers (1962) estimated that among the general population of the United States about 75% preferred Extraversion, while about 25% preferred Introversion; about 75% preferred Sensing, and about 25% preferred Intuition; about 55 to 60% of males preferred Thinking, while 40 to 45% of males tend to prefer Feeling; about 65% of females preferred Feeling while 35% of females preferred Thinking; about 55 to 60% of the general population was estimated to prefer Judging while 40 to

45% preferred Perception (Myers & McCaulley, 1985). Myers developed type tables to organize the sixteen possible personality types in a consistent format (see Appendix A).

Personality and Chronic Pain

Although some cases of chronic pain appear to have no known precipitating cause, bodily injury seems to be associated with the majority of cases. The injury typically results in the individual's inability to work, with the accompanying loss of his/her productive role, gradually diminishing self-esteem, and decreased or total loss of income. Typically there is also a change in the roles of the injured person and his or her responsibilities within the family, with other family members assuming more responsibility as the patient's contributions to the family unit decrease. Depression is common.

Mores (1983) made the observation that "...pain patients often fail to display the normal degree and time course of resolution of the loss of a loved object - a person, role, job, physical capacity, etc." (p. 51). Chapman (1983), while discussing the symptoms of depression and helplessness that many chronic pain patients report suggests that "perhaps they were unable to cope with the stresses and limitations initially brought on by an injury or life event..." (p. 59).

Cooley and Keeseey (1981) found that Introverts, Thinking, and Sensing, types were more likely to have high correlations between life changes and physical illness.

Evered (1973) described individuals who preferred Intuition and Thinking as being more likely to cope with a complex and changing future by changing to new and different strategies, while individuals who preferred Sensing and Judging were more likely to increase familiar activities.

According to Myers (1985) individuals who prefer Sensing, when faced with a difficult situation, tend "to assume that what is will not change" (p. 221).

Intuitives tend toward a more optimistic assumption that, although they are faced with a difficult situation now, there are unseen possibilities for solving their difficulties.

Bisbee, Mullaly and Osmond (1982) used the Myers-Briggs Type Indicator to study a psychiatric population with diagnosis of depression, manic depression, substance abuse, and schizophrenia and found that among the depressed patients, the greatest percentage of patients scored as Introverted, Sensing, Feeling, Judging types (23.2%).

If there are certain personality types that are more likely to cope maladaptively with an injury or pain

which results in unexpected life changes, and they could be identified as being at risk to develop the syndrome of chronic pain early in the course of their recovery by health care or rehabilitation professionals, early intervention might prevent needless suffering and save large sums of money. The present study looks at the possibility that there are personality types that are more likely to interact with an unexpected injury and it's accompanying pain and major life changes in a specific manner which leads to the development of the symptoms and behaviors of the syndrome of chronic pain.

Hypotheses

It is hypothesized that the distribution of personality preferences and types found within the chronic pain syndrome sample will differ from the distribution found within a control sample. More specifically, it is hypothesized that:

1. Persons diagnosed with chronic pain syndrome will show a significant preference for Introversion, Sensing and Judgment as compared to persons composing a control sample. This hypothesis is based on the findings of Cooley and Keesey (1981), Evered (1973), Myers (1985) and Bisbee, Mullaly and Osmond (1982) that individual's with these preferences do not adapt well to unexpected major life changes. It is also based on the observations of Mores (1983) and Chapman (1983) that

persons suffering from chronic pain syndrome seem to have difficulty dealing with major losses or stressors in their life.

2. Among persons suffering from chronic pain syndrome, scores for Sensing, Introversion and Judgment will be higher for those with a longer history of chronic pain. It is the assumption of this researcher that the longer individuals engage in maladaptive behaviors in response to their chronic pain, the stronger those maladaptive personality tendencies will become. This assumption is based in part on the references cited in hypothesis #1.

3. Among persons suffering chronic pain, scores for Introversion/Extraversion on the Myers-Briggs will be related to Depression scores as measured by the MMPI. According to the Myers-Briggs Manual (Myers & McCaulley, 1985), there is a .39 correlation ($p < .001$) between the Depression Scale of the MMPI and Introversion as measured by the Myers-Briggs Type Indicator.

Method

Subjects

Subjects in the Primary group were 82 patients with the diagnosis of chronic pain syndrome who were voluntarily admitted for treatment to a

multidisciplinary, four-week Pain Management Center at the University of Nebraska Medical Center in Omaha, Nebraska between July 1, 1987 and May 1, 1989. Due to other medical problems which were discovered within the first few days of treatment, two subjects (one female and one male) did not complete their admission testing and were eliminated from the study leaving a total of 80 subjects in this group. Characteristics of the Primary group may be found in Appendix B.

The subject sample referred to as Secondary group was comprised of 66 patients within the Primary group who were admitted between October 26, 1987 and May 1, 1989. In October of 1987 a procedural change was made at the Pain Management Center so that both admission and discharge scores are available for the Secondary group. Fourteen subjects were eliminated from this group due to these subjects either leaving treatment early (and thus not completing dismissal testing) or because dismissal test results were not available to the researcher. Of the 14 subjects eliminated, 10 were females and 4 were males. Characteristics of the Secondary group may be found in Appendix B.

A non-chronic pain Control sample representative of a normal population was utilized from the data bank available through the computerized reporting system of The Center for Applications of Psychological Type

(CAPT). Since, in theory, Myers-Briggs typology is not expected to change over time, Myers' sample of eleventh and twelfth graders (N=9,320) is considered to be a normative sample and was used for comparisons in the present study. The Normative sample consisted of 4,387 females and 4,933 males.

Procedure

Prior to admission to the Pain Management Center all subjects in the Primary group completed a standard preadmission questionnaire which included questions regarding age, sex, education, marital status, length of pain history and other demographic and background information.

Upon admission to treatment, subjects were given a packet of psychological tests to complete including the MMPI and Form G of the Myers-Briggs Type Indicator. Subjects were asked to complete the test materials within the first three days of their treatment program. The Myers-Briggs Type Indicator is currently available in three forms: Form F, Form G, and an abbreviated self-scoring Form. The main difference between Form F and Form G is that Form G has 126 items as opposed to 166 items on Form F (which includes some research items). Minor modifications in some of the wording was also accomplished on Form G to add clarity to the test instrument. In most instances the admission testing was

completed within the first three days of treatment. Any testing not completed by the fifth day of treatment was cause for eliminating a subject from the sample.

Patients admitted on or after October 26th, 1987 (Secondary group subjects) in addition to the admission testing previously described, also completed Form G of the Myers-Briggs Type Indicator and the MMPI as part of a standard battery of discharge tests administered during their fourth and final week of treatment. Any subjects whose discharge test results were not available to the researcher were eliminated from the Secondary group.

The Myers-Briggs Type Indicators were all hand scored by a staff member. The MMPI's were either hand scored or computer scored.

Hospital records were reviewed to obtain demographic information as well as the test results used for statistical analysis in the present study.

Treatment

All subjects were involved in a 28 day Pain Management treatment program at the University of Nebraska Medical Center in Omaha, Nebraska. The treatment team was comprised of members from the following disciplines: Neurosurgery, Anesthesiology, Nursing, Clinical Psychology, Physical Therapy, Dietary, Pharmacy, and Specialists in Biofeedback. The treatment

day ran from 8:00 a.m. to 5:00 p.m. Monday through Friday for four weeks. In the evenings, if the patients lived within driving distance of the Medical Center, they returned to their homes; if they were from out of town, they stayed in a hotel on the Medical Center campus. With the exception of a few individuals who lived too far away, most subjects went home to spend the weekends with their families. During the treatment day, subjects participated in both group and individual exercises designed to increase their flexibility, range-of-motion and endurance, as well as participating in daily group aquatic exercises. They were also seen individually by a Physical Therapist for treatments and education. Subjects were taught general relaxation techniques by a Biofeedback Specialist and worked individually with biofeedback to help learn how to relax specific muscle groups. Group lectures were presented twice a day by members of the treatment team on topics related to chronic pain. All subjects who entered treatment using medications to control their pain were started on a medication-reduction plan which resulted in their being medication free by the time they completed their treatment program. Subjects were seen by a Psychologist both individually and with family members for counseling. Throughout their treatment program, the emphasis was on increasing each individual's functioning

and ability to manage their chronic pain so that they might lead a more productive life.

Results

Personality Preferences in Chronic Pain Sample vs Normative Sample

To determine if the distribution of personality types and preferences as measured by the Myers-Briggs differed significantly between the representative Normative sample and the Chronic Pain sample, the frequencies of admission personality types and preferences on each of the four scales were converted into percentages for both the Primary group and the Normative group and analyzed using a Z-test for the difference between proportions (Walker and Lev, 1953). Results are displayed in Appendix C and D. Analysis revealed that the two personality types that combine Introversion, Sensing and Judging were found significantly more often (ISFJ $p < .001$, ISTJ $p < .001$) among the Chronic Pain Primary group than among the Normative control sample. The four personality types that combine Extraversion and Perception were found significantly less often among the Chronic Pain Primary group than among the Normative sample (ESFP $p < .01$, ESTP $p < .05$, ENFP $p < .05$, ENTP $p < .05$). Analysis of the preferences revealed that the Chronic Pain Primary group showed a significant preference for Introversion as

compared to the Normative sample (72.5% versus 34.97%, $p < .001$), Sensing (80% versus 68.28%, $p < .05$), and Judging (70% versus 54.8%, $p < .01$).

Length of Pain History

The 52 subjects in the Secondary group were divided into groups according to the length of time they had been dealing with chronic pain at the time they completed their preadmission questionnaire. Group I consisted of patients who had a history of 6-24 months of pain, Group II had a history of 25-60 months of pain and Group III had a history of having had pain for 61 months or longer. Observed frequencies were graphed (see Appendix E) and analyzed using the chi-square test of independence. The chi-square analysis indicated that there were no significant differences in personality preferences as a result of length of pain history for Introversion/ Extraversion ($X^2(2)=0.0339$, $p < .98$), Sensing/ Intuitive ($X^2(2)=3.6266$, $p < .16$), and Judging/ Perceptive ($X^2(2)=2.8407$, $p < .24$) while Thinking/ Feeling ($X^2(2)=5.0306$, $p < .08$) was marginally significant.

Gender

Using the formula outlined in the Myers-Briggs Manual, Introversion, Intuition, Feeling and Perception scores were added to 100 and Extraversion, Sensing, Thinking, and Judging scores were subtracted from 100 to convert the admission and discharge scores of the

Secondary group into continuous scores. A t-test of the four preference scales of the Myers-Briggs and the depression scale of the MMPI indicated that females showed a significant preference for Feeling ($t=3.51$, $p<.001$) as compared to males on admission, but only a marginal ($t=1.91$, $p<.06$) preference at the time of discharge. As mentioned earlier in the text, females in the general population tend to prefer Feeling 65% of the time whereas males prefer Feeling only 40%-45% of the time (Myers & McCaulley, 1985) so it would seem that the subjects scored similarly to the general population. Males showed a significant preference ($t=2.37$, $p<.02$) for Judging as compared to females at the time of discharge. There were no other significant differences as a result of gender (refer to Appendix F).

High versus Low Admission Depression Scores and Myers-Briggs Admission-Discharge Introversion/ Extraversion Scores

A correlated t-test of the subjects in the Secondary group using continuous scores indicated that there was a significant reduction in the Introversion/ Extraversion scores ($t=3.83$, $p<.001$) and Depression scores ($t=6.08$, $p<.001$) indicating a move toward Extraversion and lower Depression at the time of discharge from the treatment program. There was no

significant change in the continuous scores on the other scales (Sensing/Intuition, Thinking/ Feeling, Judging/ Perception) between admission and dismissal (see Appendix G).

In order to look at the relationship between continuous scores on the Myers-Briggs Introversion/ Extraversion scales and Depression scores on the MMPI, the admission and discharge scores of the Secondary group were analyzed. For the first analysis the subjects were divided into two groups according to their admission depression scores on the MMPI. Because the distribution of scores for the depression scale on the MMPI is different for males and females, males with a score of 25 or less were classified as low depression, while those with scores of 26 or greater were classified as high depression. Females with scores of 30 or less were classified as low depression while those with scores of 31 or greater were classified as high depression. A 2 (low versus high depression) X 2 (admission versus discharge Introversion/ Extraversion scores) factorial analysis of variance with repeated measures on the second variable was computed. As the results in Appendix H indicate, there was a significant main effect for Introversion/ Extraversion ($F(1,50)=11.02, p<.002$) and a significant interaction between the depression groups and admission and

discharge Introversion/ Extraversion scores ($F(1,50)=7.66$, $p<.008$) suggesting that there was a change in the Introversion/ Extraversion scores over the course of treatment as a function of whether the subject was in the high-depression or low-depression group at the time of admission to treatment.

Simple effects were computed and revealed that subjects who were in the MMPI high-depression group upon admission showed a significant ($F(1,50)=24.08$, $p<.01$) shift toward Extraversion on the Myers-Briggs Type Indicator in their discharge test scores. Subjects who were in the MMPI low-depression group on admission did not show a significant shift on the Introversion/ Extraversion scale of the Myers-Briggs Type Indicator at the time of discharge (refer to Appendix I).

Myers-Briggs Admission Introversion/ Extraversion scores and Admission-Discharge MMPI Depression Scores

Subjects in the Secondary group were then divided into two groups based upon their admission Introversion/ Extraversion scores, with Introverts being in one group and Extraverts in the other group. A 2 (Introversion versus Extraversion) X 2 (admission and discharge Depression scores) factorial analysis of variance with repeated measures on the second variable was computed. A significant main effect for depression was found

($F(1,50)=33.25, p<.001$), indicating that there was a reduction in depression scores over the course of treatment (refer to Appendix J). There was no significant interaction found as a result of the group (Introversion or Extraversion) that the subject was in upon admission to treatment, suggesting that the reduction in depression scores over the course of treatment was independent of the admission Introversion/Extraversion scores (refer to Appendix K).

Discussion

The results of this study demonstrated that the Chronic Pain sample scored significantly higher in their preference for Introversion, Sensing and Judging than the Normative sample. The Chronic Pain sample had significantly more ISFJ and ISTJ personality types than the Normative sample. It had been hypothesized that the trend toward these personality preferences would be stronger among those who had been dealing longer with their chronic pain problem, but length of pain history was found to be nonsignificant.

A problem with the present study is that the Normative sample consisted of 11th and 12th graders whereas the Chronic Pain sample consisted of adults aged 22 to 72 with an educational level ranging from the 7th grade to graduate degrees. According to Myers and McCaulley, (1985), "an estimate of type in the general

population can be based on ...[this 11th and 12th grade sample]" (p. 45). They point out, however, that it "... can be expected to have more Introverts and Intuitive types than the general population since Myers' studies of high school dropouts found a greater proportion of extraverts and sensing types" (p.45). Other samples were considered but were thought to be less representative of the general population than the sample chosen. For example, the VALS sample was obtained from 2,000 randomly selected households with a return rate of 55% (446 males and 659 females). This sample is somewhat biased toward more affluent groups and there is speculation that the results may also be confounded by a higher rate of return from personality types such as ISJ's who are known to be more conscientious and dependable and would be more likely to return their data (Myers & McCaulley, 1985, p. 45). Numerous other samples of adult groups are available but consist of data from specific professions and would be biased towards the personality types that chose those careers. Future research could include a comparison of the personality types of subjects who suffer work-related injuries but do not experience the syndrome of chronic pain with a group who experience similiar injuries and do experience the syndrome of chronic pain.

Earlier studies have shown a correlation between

MMPI depression scores and Myers-Briggs Introversion/ Extraversion scores (higher depression correlating with stronger Introversion) and the current research tends to confirm this finding. Subjects who scored high on depression when they were admitted for treatment scored significantly lower on the MMPI depression scale as well as exhibiting a significant move toward the Extraverted preference on the Myers-Briggs at the time of discharge. On the other hand, subjects who were within the normal range for depression on admission did not exhibit a significant change on the Introversion/Extraversion scale at the time of discharge. Furthermore, there was a significant shift toward lower depression scores at discharge for the Chronic Pain sample irrespective of whether they scored as preferring Introversion or Extraversion at the time of admission to treatment. This would tend to indicate that preferring Introversion does not necessarily lead to depression but that depression can lead to Introversion.

Hirsh and Kummerow (1989) point out that each of the sixteen personality types of the Myers-Briggs Type Indicator contain strengths and weaknesses. Each type has the potential for overuse or abuse, which is most likely to manifest when an individual is under great stress or pressure. Most chronic pain patients report that their pain began in response to a sudden injury

which resulted in major life changes such as the inability to return to their former job or recreational pursuits. The present findings seem to indicate that the stress of unwanted pain and major life changes can result in greater dysfunction for the personality types of ISTJ and ISFJ. According to Hirsh and Kummerow (1989), both of these types can get stuck in a rut, unable to see the larger picture, unable to see beyond today. In addition, ISTJ's can immerse themselves in details, become rigid and inflexible and ignore the larger issues of life. ISFJ's have a tendency to become rigid in a different way in that they tend to plan excessively and become upset when things do not go a certain way; they are unable to relax and accept what comes. These characteristics would lend themselves well to developing the symptoms of chronic pain syndrome wherein an individual gets "stuck" focusing on their physical complaints, rigidly carrying out pain behaviors, unable to see beyond their present situation to visualize a different lifestyle for themselves.

One of the implications of this research is that early screening of individuals who are injured could help identify those who are at high risk to develop chronic pain syndrome. Once high risk individuals are identified, counseling could be implemented early in an effort to help them cope with the stress of their injury

and life changes and to assist them to visualize different options for dealing with their problem.

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Appendix A

Myers-Briggs Type Indicator blank Type Table.

SENSING		INTUITIVE		
THINKING	FEELING	FEELING	THINKING	
ISTJ	ISFJ	INFJ	INTJ	J U D G I N G
ISTP	ISFP	INFP	INTP	I N T R O V E R T S
ESTP	ESFP	ENFP	ENTP	P E R C E P T I V E
ESTJ	ESFJ	ENFJ	ENTJ	P E R C E P T I V E
				E X T R A V E R T S
				J U D G I N G

Appendix B

Demographic frequencies of Primary and Secondary Groups.

	Primary Group	Secondary Group
Total	80	52
Males	27	18
Females	53	34
Age range	22-72	23-65
Mean Age	41.9	41.3
Married	59	38
Divorced	11	7
Separated	2	2
Widowed	3	1
Single/Never Married	5	4
Graduate degree	3	2
College degree	6	6
Some college*	18	7
High School/GED	37	25
10th-11th grade	10	7
7th-9th grade	6	5

*at least one year completed.

Appendix C

Z test of Personality Profiles of Primary Group (PG) and Control Group (CG).

ISTJ PG=21.25% CG=6.1% Z=5.6619***	ISFJ PG=22.5% CG=6.97% Z=5.4549***	INFJ PG=0% CG=1.8% Z=-1.2127	INTJ PG=3.75% CG=2.55% Z=-.6809
ISTP PG=8.75% CG=4.04% Z=2.1396*	ISFP PG=6.25% CG=5.41% Z=.3321	INFP PG=7.5% CG=3.92% Z=1.6499	INTP PG=2.5% CG=3.46% Z=-.4698
ESTP PG=1.25% CG=6.38% Z=-1.8763*	ESFP PG=1.25% CG=9.5% Z=-2.5175**	ENFP PG=2.5% CG=7.7% Z=-1.7434*	ENTP PG=0% CG=4.8% Z=-2.0084*
ESTJ PG=8.75% CG=12.91% Z=-1.1097	ESFJ PG=10% CG=14.33% Z=-1.1053	ENFJ PG=2.5% CG=3.655% Z=-.5505	ENTJ PG=1.25% CG=3.84% Z=-1.2055

*p<.05. **p<.01. ***p<.001.

Appendix D

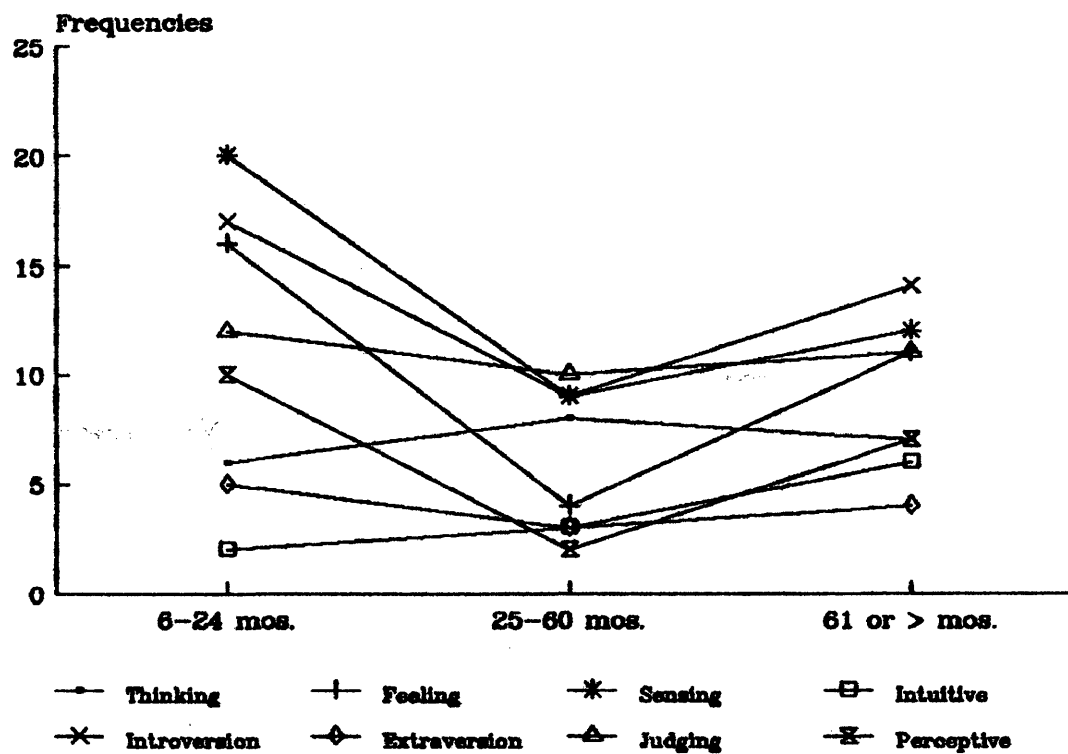
Z test of Personality Preferences of Primary Group (PG)
and Control Group (CG).

EXTRAVERSION PG=27.5% CG=64.95% Z=-7.0204***	INTROVERSION PG=72.5% CG=34.97% Z=7.0403***
SENSING PG=80% CG=68.28% Z=2.2525*	INTUITION PG=20% CG=31.725% Z=2.2533*
THINKING PG=47.5% CG=46.72% Z=.1407	FEELING PG=52.5% CG=53.25% Z=.1353
JUDGING PG=70% CG=54.8% Z=2.7317**	PERCEPTION PG=30% CG=45.2% Z=2.7325**

*p<.05. **p<.01. ***p<.001.

Appendix E

Frequencies of Personality Preferences of
Secondary Group by length of pain history.



Appendix F

T-test of Personality Preferences and Depression scores
of Secondary Group (SG) at the time of admission and
discharge as a function of gender.

Variable*	<u>M</u>	<u>SD</u>	t-value	<u>p^b</u>
Adm. I/E				
Male	120.0000	24.430		
Female	113.4706	22.271	.97	.335
Dis. I/E				
Male	105.3333	22.588		
Female	107.0000	23.924	-.24	.809
Adm. S/N				
Male	87.3333	33.433		
Female	77.7647	23.251	1.21	.232
Dis. S/N				
Male	84.1667	32.326		
Female	79.1176	27.289	.60	.554
Adm. T/F				
Male	89.3333	21.390		
Female	110.0000	19.536	-3.51	.001
Dis. T/F				
Male	91.6667	21.199		
Female	103.1176	20.253	-1.91	.062
Adm. J/P				
Male	101.9444	27.748		
Female	89.2941	25.010	1.67	.101
Dis. J/P				
Male	100.5556	25.581		
Female	83.5294	24.097	2.37	.022
Adm. Depr.				
Male	34.4444	7.221		
Female	31.4706	6.702	1.48	.145
Dis. Depr.				
Male	27.3333	8.246		
Female	26.9118	5.900	.21	.832

*n=18 males and 34 females for each ^btwo-tailed

Appendix G

Correlated t-test of admission and discharge Myers-Briggs continuous scores and MMPI Depression scores.

Variable	Admission	Discharge	T-Value
Introversion/Extraversion			
<u>M</u>	115.73	106.42	
<u>SD</u>	23.02	23.26	3.83*
Sensing/Intuition			
<u>M</u>	81.08	80.87	
<u>SD</u>	27.27	28.92	.08
Thinking/Feeling			
<u>M</u>	102.85	99.15	
<u>SD</u>	22.32	21.11	1.67
Judging/Perception			
<u>M</u>	93.67	89.42	
<u>SD</u>	26.43	25.71	1.50
Depression			
<u>M</u>	32.50	27.06	
<u>SD</u>	6.96	6.76	6.08*

* $p < .001$

Appendix H

Admission and discharge Introversion/ Extraversion
continuous scores as a function of Depression scores at
the time of admission.

 SOURCE OF VARIATION

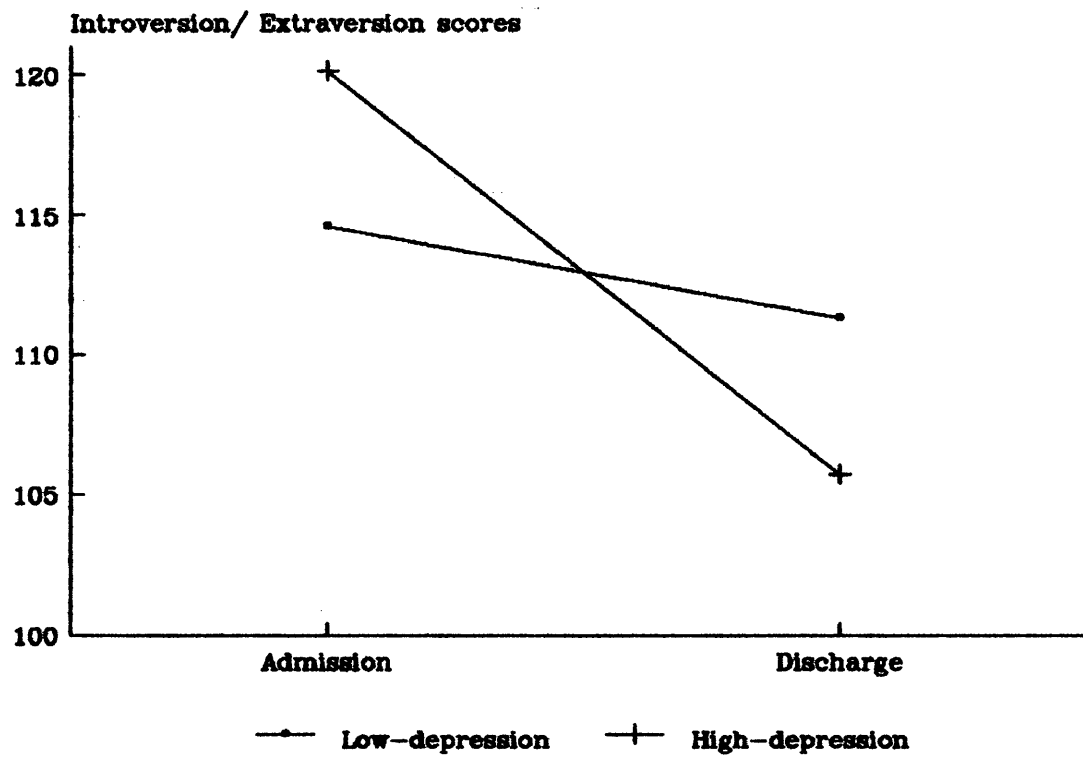
	SS	DF	MS	F	Sig.
Within Cells	6805.54	50	136.11		
I/E ^a	1500.00	1	1500.00	11.02	.002
Depr. ^b by I/E	1042.00	1	1042.00	7.66	.008

^aAdmission and discharge Introversion/ Extraversion

^bAdmission depression

Appendix I

Admission-Discharge Introversion/Extraversion scores as
a function of admission Depression scores.



Appendix J

Admission and discharge Depression scores as a function
of preference for Introversion or Extraversion at the
time of admission.

SOURCE OF VARIATION

	SS	DF	MS	F	Sig.
Within Cells	1034.52	50	20.69		
Depr. ^a	687.89	1	687.89	33.25	.000
I/E ^b by Depr.	27.89	1	27.89	1.35	.251

^aAdmission and discharge Depression
Introversion/ Extraversion

^bAdmission

Appendix K

Admission and discharge Depression scores as a function of preference for Introversion or Extraversion at the time of admission.

