I, Laurie A Navin, hereby submit this original work as part of the requirements for the degree of Doctor of Education in Counselor Education.

It is entitled:
The Relationship of Pain Catastrophizing to Perception of Partner Response to Pain Behaviors and Relationship Satisfaction Among Injured Workers Suffering From Chronic Pain

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The Relationship of Pain Catastrophizing to Perception of Partner Response to Pain Behaviors and Relationship Satisfaction Among Injured Workers Suffering From Chronic Pain

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Abstract

The purpose of this quantitative study was to determine the impact of pain catastrophizing on perception of partner response to pain behaviors and relationship satisfaction among injured workers suffering from chronic pain and their partners. The participants were 20 adult married injured workers receiving psychological services in a private practice setting specializing in the treatment of chronic pain and psychological conditions. The partners of these 20 injured workers were also involved in the study.

Pain catastrophizing by injured workers was assessed using the Pain Catastrophizing Scale. Perceived partner response to pain behaviors was assessed using the West Haven-Yale Multidimensional Pain Inventory. In an effort to validate perceived partner responses to pain, spouses completed the West Haven-Yale Multidimensional Pain Inventory For Significant Others. Finally, relationship satisfaction among injured workers and their spouse was assessed using the Dyadic Adjustment Scale. A McQuitty Linkage Analysis was used to examine the manifold relationships among scales.
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Chapter I

Introduction

Chronic pain, particularly low back pain, affects between 60% and 80% of Americans at some point in their lives. Chronic pain is the most prevalent cause of occupational disability in individuals under 45 years of age, and the third most prevalent in those over 45 years of age with an estimated total annual cost in the U.S. between $40 and $50 billion due to chronic inability to return to work (Truchon, 2001). While this poses serious consequences on the health care system, the human costs are also very significant and multifaceted: chronic pain, decreased quality of life, disability, financial strain, and psychological distress affecting the injured worker and his or her family.

Chronic pain can be defined as pain that has lasted at least six months, is ongoing, and has not responded to currently available treatment methods (Dysvik, Lindstrom, Eikeland, & Natvig, 2004).

For several years, comprehensive evaluation of the chronic pain patient has focused more on the family system, and in particular, the marital relationship (Schwartz, Slater, & Birchler, 1996). Two aspects of the marital relationship have been highlighted as being important in understanding the chronic pain patient. First, much research has been conducted to explore the relationship between spouse’s behavioral responses to the patient’s pain behaviors and patient functioning. For instance, several studies have shown that solicitous spouse responses (e.g., attention, sympathy) to the patient’s pain behaviors are related to greater functional impairment and higher self-reports of pain intensity in chronic pain patients (Schwartz et al., 1996). A second aspect of the marital relationship impacting the chronic pain patient is the management of stress and conflict.
within the marriage. In addition to the typical conflicts and stressors that arise in most marriages, couples dealing with a chronic pain issue also need to adapt to changes in the marital system stemming from the chronic pain problem such as job and role changes, financial stressors, and impaired sexual functioning due to chronic pain. Given these challenges faced by the chronic pain patient and his or her spouse, a relationship likely exists between interpersonal or marital distress and pain behaviors.

Recent conceptualizations of pain catastrophizing (i.e., a negative and/or exaggerated focus on pain) have focused on the interpersonal aspect of this phenomenon. For instance, previous research has indicated that pain catastrophizing is used as a communal coping strategy (Boothby, Thorn, Overduin, & Ward, 2004) aimed at garnering increased attention or empathy from significant others in their social environment, as opposed to attempts to reduce the pain. Research by other investigators (Giardino, Jenson, Turner, Ehde, & Cardenas, 2003) also supports a relationship between catastrophizing as assessed by the Pain Catastrophizing Scale and solicitous responses from others. One of the core tenets of behavioral and cognitive-behavioral conceptualizations of chronic pain is that pain-related behaviors (e.g., limping, pain complaints or excessive resting) can be maintained by the responses of a pain patients’ significant other, such as their spouse, partner, or family member (Sharp & Nicholas, 2000). In addition, the findings of other studies have indicated that cohabitating with someone who is suffering from chronic pain is associated with measures of significant others’ distress and behavior, and in most studies, patients’ significant others have frequently been implicated as the primary reinforcing agent of pain behaviors (Sharp et al., 2000). Further study of the catastrophizing-support construct may be useful in
providing additional insights into the relationship between significant others’ responses and the chronic pain patients’ negative outcomes (e.g., psychological distress, disability).

**Statement of the Problem**

As the upcoming literature review will document, the issues facing the chronic pain patient and relationship to their significant other are not new to medical and psychological research, and have been deserving of the attention received to date. The overarching question to be answered in this study is: What is the relationship between the injured worker’s pain catastrophizing and sense of relationship satisfaction, and his or her partner’s responses to the injured worker’s pain behaviors and sense of relationship satisfaction?

This study was designed to expand on existing literature on the chronic pain patient in several ways. First, the population selected for this study is specific to the special circumstances of the injured worker receiving psychological treatment in a private practice setting. Initially, pain catastrophizing by the injured worker was assessed by completion of the Pain Catastrophizing Scale. The relationship between pain catastrophizing and perception of partner response to pain behaviors among injured workers was explored using the West Haven-Yale Multidimensional Pain Inventory. Next, in an effort to validate perceived partner responses to pain, spouses completed the West Haven-Yale Multidimensional Pain Inventory For Significant Others questionnaire. Finally, the relationship between pain catastrophizing and relationship satisfaction among injured workers and their spouse was assessed by completing the Dyadic Adjustment
Scale. In addition, the moderating influence of gender was explored in relation to the statement of the problem.

**Significance of the Problem**

The significance of this study is justified by several factors. The population of Americans suffering from chronic pain is alarmingly prevalent, and the social cost associated with chronic pain sufferers continues to grow (Truchon, 2001). Despite expansion of the treatment modalities for chronic pain sufferers, this expanding problem continues to appear intractable (incurable, severe, and constant) (Margo, 1994; Strunin & Boden, 2004). More important and specific to this study, chronic pain among injured workers has received only minimal attention to date in the research literature (Cano, 2004; Strunin & Boden, 2004; Sullivan, Stanish, Waite, Sullivan, & Tripp, 1998). A more detailed rationale for this study is outlined in the following literature review.

**Literature Review**

**Scope of the Problem**

Work-related pain, especially back pain, is a major health issue among workers in the United States, and accounts for nearly one-quarter of all workers’ compensation claims filed (Strunin & Boden, 2004). In one study, the cost of lost productive time in the U.S. workforce due to pain-related conditions was estimated to be as much as $61.2 billion per year, with 76.6% of this cost occurring while employees are still at work (Stewart, Ricci, Morganstein, Lipton, & Chee, 2003). This amount accounts for approximately 27% of the total estimated work-related cost of pain conditions in the U.S. workforce. Stewart et al. (2003) note limitations by previous researchers on this topic, notably the tendency to focus on single pain disorders rather than a range of common
pain disorders and the focus on lost time due to absenteeism versus lost productivity while at work. This limitation is important because increasing evidence indicates that reduced work performance due to pain rather than absenteeism is the primary cause of lost productive time (Stewart et al., 2003). While previous studies of back pain have highlighted the economic and health impacts in terms of lost workdays and healthcare costs, minimal attention has been given to describing and measuring the personal and social costs of living with chronic back pain (Strunin & Boden, 2004). A large number of researchers share the view that disability most accurately reflects the negative impact of the disorder on the person’s life and his or her social network (Kroner-Herwig et al., 1996).

**Social Cost of Chronic Pain**

In 1911, New York was the first state to legislate workmen’s compensation insurance, and by 1949, all states independently administered workers’ compensation insurance programs (Hadler, 2007). Several stipulations were common to these statutes and remain so today. Foremost is to provide medical costs and lost wages when a worker has experienced a work-related personal injury, generally defined as an injury that arose out of and in the course of employment (Hadler, 2007). When the workers’ compensation statutes were developed, they were based on the principle of ‘exclusive remedy.’ According to this principle, an employee would agree not to sue the employer because of a work-related injury, and in return, the injured employee would receive total reimbursement for any and all medical costs incurred, as well as full or partial wages during the period the employee was unable to work. If the disability was permanent, the employee would receive compensation indefinitely unless a lump sum settlement was
agreed upon by the employer and employee (Pader, 1998). It was anticipated that such compensation laws would provide fair and equitable protection for both the injured employee and his or her employer. Unfortunately, this has not been the case.

While society is actively seeking to control the costs of non-occupational injury and illness by various modalities such as health maintenance organizations and regulated fees under Medicare and Medicaid, the costs of occupational injury continue to increase progressively (Pader, 1998). There are several reasons for this. For instance, workers’ compensation costs often have no relationship to the actual severity of the injury or illness. Medical considerations are often sidetracked, and psychological, social, and economic considerations become determining factors. Job dissatisfaction, disputes with supervisors, domestic problems, combined with the availability of workers’ compensation and other benefits, all combine to prolong the period of disability and to delay the return to work (Pader, 1998). Another factor contributing to the escalating costs of workers’ compensation is the absence of any well-defined standard of care. The medical care of the injured employee is often provided by practitioners with little or no expertise in occupational medicine, with little or no concern for the productivity and economic costs of prolonged disability, and with the knowledge that all the medical costs are usually paid by the employer and their insurance carriers (Pader, 1998). Workers’ compensation insurance typically costs U.S. employers 2-4% of their gross expenses (Hadler, 2007). Since the attending physician legally controls the length of disability and the opinion of when or if an employee should return to work, the relationship between employee and physician can ultimately increase costs and disability.
History of Chronic Pain Treatment

Pain is a complex clinical problem and is known as the oldest medical problem among mankind (Meldrum, 2003). Despite this phenomenon, pain has been scarcely understood in physiology until recent years.

In the utilitarian era of the 18th and 19th centuries, pleasure was balanced against pain to determine the good of society. The physician viewed the patient’s pain as a sign of vitality and equated pain with confidence in the power and energy of life (Meldrum, 2003). Opiates were the standard treatment for acute pain from injuries and for recurrent pain throughout the 19th century. However, the conflict between the physician’s desire to relieve the patient’s pain and fear of inducing addiction persisted throughout medicine throughout the 20th century. Patients equated morphine use with a loss of autonomy that the strong should resist at all costs (Meldrum, 2003).

By the 1920’s, those who suffered from chronic intractable pain syndromes were largely regarded by the medical profession as deluded, malingerers, or drug abusers. This viewpoint, known as specificity theory, became the standard model taught in U.S. medical schools (Meldrum, 2003). Psychoanalysts, in turn, found these disorders useful to explain mental or emotional disorders. As morphine and other opiates became more heavily regulated, the only available treatment for most patients suffering from intractable pain was psychotherapy or more invasive surgical procedures designed to prevent the transmission of pain sensation to the spinal cord and brain.

In 1965, the Canadian psychologist Ronald Melzack and the British physiologist Patrick Wall published their classic “gate control” article, proposing a spinal cord mechanism that regulated the transmission of pain sensations between the periphery and
the brain (Meldrum, 2003). The gate model gained attention by psychologist Richard
Sternbach, who argued that physiological and affective perceptions of pain should be
understood as learned responses of the nervous system, interactive with the individual’s
learned behaviors in coping with pain experiences (Meldrum, 2003). This learning
theory of pain suggested a therapeutic approach based on re-learning or conditioning.
Wilbert Fordyce and his colleagues soon introduced operant conditioning into the
treatment of chronic pain, using physician attention as a reward to help patients learn to
self-manage their pain and resume normal functioning through graded activity (Meldrum,
2003).

In 1982, the World Health Organization developed a set of guidelines for the
physician, recommending that he or she prescribe analgesics on a regular schedule and
titrare the dosage to the patient’s pain at each of the three steps: from a non-steroid
inflammatory drug such as aspirin, to a weak opiate like codeine, to a strong opiate like
morphine (Meldrum, 2003). Although many adjunct drugs are recommended for patients
who fail to respond to opiates or who find the adverse effects intolerable, oral morphine
remains the mainstay of most pain conditions today; however, regulatory barriers to
morphine use and clinician concerns about addiction persist in many parts of the U.S. and
in many countries abroad (Meldrum, 2003).

Research in the last thirty years has developed a variety of alternatives or adjuncts
to opiates for chronic pain, including neuroactive medications, counterstimulation
methods, and cognitive-behavioral therapies. Behavioral conditioning or modification
programs have proved helpful to many patients; however, these modalities are expensive
and time intensive, and have been replaced or augmented in many multidisciplinary pain
programs by cognitive-behavioral methods that emphasize the teaching of coping skills (Meldrum, 2003). Although cognitive-behavioral therapy is similar to learning theory in that they share the assumption of reciprocal relationships between sensation, cognition, emotion, and behavior, it makes the additional assumption that individuals are active information processors able to change the way they think, feel, and believe. These programs have been more effective in improving mood and function and decreasing pain and disability levels in such problems as lower back pain (Meldrum, 2003). Some observers; however, have criticized cognitive-behavioral programs for shifting the burden of therapeutic responsibility to the patient, who must alter his or her cognition and behavior to get relief from pain.

The progression of pain research and analgesic development since 1973 has not altered the fact that no single treatment is effective for every patient, even for pain of the same type and etiology. Thus, it remains that the meanings derived from pain: cognitive, affective, and behavioral, vary for each individual and form the pain experience and response to therapy. Even with many new resources available, this explains why effective pain management remains a challenge for most clinicians.

**Nature of Chronic Pain and Theoretical Concepts**

Persons living with chronic pain often report a distorted view of themselves. For instance, due to changes in their lifestyle brought on by pain, they struggle between living up to their expectations of how they are (actual self), how they would like to be (ideal self), and how they feel they ought to be (ought self). Thus, there is growing attention on the discrepancy between how one is and how one would like to be, and how this viewpoint enhances the experience of pain-related suffering (Waters, Keefe, & Strauman,
This concept, referred to as self-discrepancy theory, maintains that the ideal self and ought self are self-guides that function as standards by which the actual self is evaluated and that discrepancies between actual self and ideal self or actual self and ought self may lead to increased psychological distress. For instance, persons experiencing a significant discrepancy between actual self and ideal self are more prone to depression, sadness, discouragement, anxiousness, worry, and fear than those reporting minimal or no actual-ideal discrepancy (Waters et al., 2004).

Understanding self-discrepancies in persons suffering from chronic pain is important for several reasons. Specific to this study, a higher degree of self-discrepancy has been linked to increased focus on the intensity and unpleasantness of pain, or pain catastrophizing (Waters et al., 2004). In addition, increased psychological distress in patients who experience discrepancies between their actual self and the self they believe significant others think they ought to be may relate to how patients with chronic pain interpret the feedback they receive from significant others (e.g., responses in the form of gestures, words, and actions). This concept of significant others’ feedback influencing views of self is described by the theory of symbolic interactionism, which maintains that individuals construct their self-concept, in part, by imagining and experiencing how significant others react to them and then internalizing this feedback into their own concept of self (Waters et al., 2004).

Drawing on this theory of symbolic interactionism, it follows that patients experiencing chronic pain perceive that the behaviors of significant others (e.g., being overly solicitous or criticizing) indicate that they have lost their sense of independence and are no longer capable of fulfilling important responsibilities. As a result, these
patients adopt negative self-concepts which can be highly influenced by their significant others. Symbolic interactionism would posit that as this negative self-concept expands, it tends to increase psychological distress (Waters et al., 2004).

**Phenomenon of Pain Catastrophizing and Relationship Satisfaction**

Numerous studies of patients with a variety of chronic pain issues have concluded that patients’ beliefs about their pain (e.g., belief that one can control one’s pain or belief that one is disabled by pain) and the strategies they use to cope with their pain are associated with various measures of pain intensity and psychosocial and physical functioning (Turner, Jensen, & Romano, 2000). One phenomenon gaining attention in the chronic pain literature is the act of patient catastrophizing (the phenomenon of expecting or worrying about major negative consequences from a situation, even one of minor importance). Several studies of chronic pain patients have found catastrophizing to be associated with increased pain and physical and psychosocial dysfunction (Turner, Jensen, Warms, & Cardenas, 2002).

Pain catastrophizing is commonly described as a cognitive process; however, some research has proposed catastrophizing as a communal coping strategy intended to garner increased attention or empathy from others in their social environment (Sullivan, Tripp, & Santor, 2000). One study concluded that catastrophizing was positively correlated with pain scores among individuals living with a partner, but not related to pain scores among individuals living with someone else, such as a relative (Giardino, Jensen, Turner, Ehde, & Cardenas, 2003). Another study, which explored cancer patient catastrophizing and patients’ perceptions of social support from caregivers, found that patients who catastrophized perceived receiving higher levels of instrumental support.
from caregivers, but not significantly greater emotional support, which suggests that
catastrophizing may be serving as a coping function, with increased instrumental support
from caregivers further reinforcing high levels of catastrophizing (Keefe et al., 2003).
Interestingly, caregivers in this study perceived themselves as responding negatively to
patients, indicating that family members appear to be hindered by the catastrophizing
patient.

Related to this study, recent research exploring the interpersonal relationships of
chronic pain patients has focused more on spousal interactions. This research generally
concludes that there is a correlation between solicitous spouse behaviors (i.e., expressions
of concern, support, and extensions of assistance) and poor pain outcomes, such as
heightened pain, lower activity levels, increased pain behaviors, and increased disability
(Boothby, Thorn, Overduin, & Ward, 2004). Based on the communal coping model of
catastrophizing, Boothby et al. hypothesized that those patients who catastrophize would
perceive their partners as more solicitous; however, their data did not support this
concept. Instead, catastrophizing was found to be significantly associated with perceived
punishing partner behavior, meaning that pain patients scoring higher on a measure of
catastrophizing perceived their partners as responding to their pain with irritation,
frustration, and anger. Thus, this data raises questions about the use of catastrophizing as
a coping mechanism.

Research by Cano (2004) indicated that catastrophizing was significantly related
to increased perceptions of pain-related spousal support in patients with shorter pain
durations, but no significant relationship was found for patients experiencing longer pain
durations. The communal coping hypothesis suggests that patients with chronic pain
catastrophize to garner intimacy and closeness. In the early stages of pain, Cano proposes that patients may be sending the message that they want or need support from their spouses with the goal of alleviating their pain. However, at longer pain durations, catastrophizing may result in diminished perceptions of pain-specific spousal support since patients did not receive the intimacy they desired earlier in their illness. In any case, it is unclear if catastrophizing influences actual support, changes patients’ perceptions over time, or both. Additional research may address these issues and whether patients prefer more closeness or intimacy vs. pain-specific support from their spouses. Furthermore, the fact that Cano’s research showed that neither marriage duration nor the difference between marriage and pain duration was a significant moderator of catastrophizing indicates that the pain duration may be an important element in the relationship between pain cognitions and interpersonal interactions. In Cano’s study, it was not known if pain problems began before or after patients met their spouses, which is another possible moderator of catastrophizing to explore in the future. With regard to treatment, future research may also indicate that consideration of pain duration and relationship functioning is beneficial in that reductions in catastrophizing may be related to improved relationship functioning.

More recent research conducted by Buenaver, Edwards, and Haythornthwaite (2007) investigated the relationship between catastrophizing and pain-related outcomes in a way that incorporated perceived significant other solicitous and punishing responses as mediators and pain duration and perceived social support as moderators of those relationships. Results of this study indicated that catastrophizing was related to a perception of increased punishing responses when pain patients had a perception of low
social support, and to a perception of fewer punishing responses when pain patients perceived higher levels of social support. In terms of pain duration, catastrophizing was related to a perception of increased perceived solicitous responses at shorter pain durations, and a perception of fewer solicitous responses at longer pain durations. This study confirmed findings of previous studies (Boothby et al., 2004; Cano, 2004) which associate stronger relationships between catastrophizing and punishing responses than between catastrophizing and solicitous responses. In terms of distracting responses in relation to catastrophizing, research by McCracken (2005) found no significant correlation in this area. It was reasoned that distracting responses can function either negatively, in an attempt to move the patient away from pain, or positively, in an attempt to help the patient engage in productive or meaningful activity. More research in this area is needed to clarify the role of distracting responses in relation to catastrophizing. What has not yet gained significant attention in this and other research on catastrophizing is a concrete measure of the pain patient’s verbal and behavioral expressions of catastrophizing, as well as the responses of significant others. Further research in these areas will help to clarify the likely important impact of catastrophizing on the social and interpersonal environments of patients in pain.

The implications of this and other research about pain catastrophizing suggests that both pain catastrophizing and perceived solicitous partner behaviors are independently associated with pain and not acting as mediators of one another in the relationship with pain outcomes. In any case, both variables are important in understanding adjustment to chronic pain. Although pain catastrophizing may not be directly reinforced by solicitous partner behavior, it is conceivable that intermittent
reinforcement exists, as well as by different significant others such as friends, physicians, or therapists in regular contact with the pain patient (Boothby et al., 2004). The data collected by Boothby et al. (2004) suggest that significant others may become more irritated or frustrated by the patient’s chronic expressions of pain, and no longer attempt to soothe them because they have learned over time that catastrophizing does not necessarily signal that they are in acute distress. Thus, they perceive patients’ repeated expressions of pain as manipulative, controlling, or maladaptive. Given this pattern of behaviors, Boothby et al. hypothesized from their findings that catastrophizing would impact the marital relationship negatively, resulting in increased marital discord and decreased marital satisfaction. This study is intended to expand on this concept and provide further clarity on pain catastrophizing and the marital relationship.

The Moderating Influence of Gender on Pain Catastrophizing

Some studies have found that male and female spouses respond differently to expressions of distress by their partners suffering from chronic pain. For instance, Hafstrom and Schram (1984) found that wives’ satisfaction with marriage and other spousal interactions (i.e., husband’s understanding of wife’s problems, husband’s role as a father) were significantly lower when their husbands suffered from chronic pain as compared to a healthy control group. However, when wives were afflicted with chronic pain, the husbands’ satisfaction with spousal interactions was not significantly reduced. A study by Flor, Turk, and Rudy (1989) confirmed previous findings that women tend to be more distraught about their husband’s chronic pain than men are about their wives’ condition.
Treatment Considerations: Pain Catastrophizing and the Marital Relationship

Research by Kerns, Haythornthwaite, Southwick and Giller (1990) found that, in the context of a satisfying relationship, a pattern of solicitous responding to pain appears to be linked to more elevated pain levels; while less expression of attention to pain behaviors (although remaining globally positive) appears to be linked to a decreased experience of pain. This research further established that pain patients who experience a generally low level of marital satisfaction while also experiencing a high frequency of punishing responses contingent on demonstrations of pain are more prone to experiencing depressive symptoms. Of particular significance to theoretical and clinical aspects of this research is the finding that among maritally satisfied pain patients, perceptions of a relatively high rate of punishing responses to pain is associated with a low likelihood of depressive symptoms. This point argues that selective ignoring or even direct aversive responses to pain behaviors in the context of a generally high frequency of positive communication may play an important role in reducing the degree of pain and suffering experienced by the patient (Kerns et al., 1990).

Thus, this research supports a model of optimal marital interactions that includes positive communication and mutual reinforcement for desired behaviors and outcomes, but also selective ignoring of undesirable behaviors (i.e., pain complaints and disability). Comprehensively, these findings contribute to an evolving understanding of the influence of marital interactions on the maintenance and exacerbation of the experience of pain and depression among individuals suffering from chronic pain. Furthermore, these results may have important implications for the comprehensive treatment of chronic pain patients, suggesting that conjoint therapy that promotes positive marital communication
and targets other deficits in marital functioning may be helpful in minimizing depressive symptoms in chronic pain patients (Kerns et al., 1990). Shortcomings noted of this study include the lack of spouse-reported data to substantiate patients’ self-reports, the lack of significant female pain patients incorporated in the findings to examine possible gender differences, and a more specific measure of marital communication to further clarify data.

**Characteristics of the Chronic Pain Patient and the Marital Relationship**

Until recently, few studies have systematically examined the role of social, cultural, family and interpersonal variables in patients with chronic pain. Interestingly, Freud was the first to suggest an increased prevalence of pain problems in patients and their respective families (Mohamed, Weisz, & Waring, 1978). Merskey, as cited in Mohammed et al. (1978), expanded on Freud’s early observations in his study of adult patients with chronic pain, and observed that patients with chronic pain tend to come from large families, tend to be engaged in relatively unskilled or semiskilled work, marry more than other psychiatric patients and have a fairly high incidence of sexual difficulty and maladjustment in marriage.

Despite the evidence supporting a relationship between familial/marital maladjustment and chronic pain, increased levels of pain have also been associated with marital satisfaction from the spouse’s perspective (Feuerstein, Sult, & Houle, 1985). For instance, spouses of chronic pain patients who reported a high level of marital satisfaction were observed to behave in a more solicitous manner than relatively unsatisfied spouses (Feuerstein et al., 1985). We also know; however, that solicitous behavior in spouses of chronic pain patients tends to exacerbate the patient’s experience of pain. It can be concluded, then, that it is not marital satisfaction per se, but rather specific familial
characteristics and/or behavioral responses of family members that may serve to maintain and/or exacerbate chronic pain in the patient (Feuerstein et al., 1985).

As previous studies have shown, support from the spouse can reduce depression in patients with chronic pain, add to their quality of life, and increase a positive treatment outcome (James & Large, 1992). Block and Boyer (1984) found that spouses of people with chronic pain did not generally experience elevated psychological distress. However, psychological distress was higher if the quality of the marriage was poor, if the spouses were pessimistic about prognosis, and if they saw the patient as disabled and distressed. Uncertainty about pain, helplessness, and disruption of patterns of family living were primary contributors to the distress experienced by spouses. Spouses who reported higher stress levels and increased marital dissatisfaction (wives more often than husbands) were partners of individuals with longer pain durations and more often unemployed. Consequently, more demands were made on them for assisting in care of the individual and household (James et al., 1992).

In terms of pain ratings, research has found that distressed spouses produced higher ratings of their spouse’s pain, while low-distress spouses underestimated pain and were not aware of factors that mediated the patient’s pain. Spouses in the high-distress group were more likely to assume a protector role, while those who had low distress were more likely to avoid the patient’s pain. Interestingly, high congruence between patient and spouse in evaluating the severity and impact of pain was related to poor treatment outcome; while initial incongruity between patients and significant others’ ratings of family relationships was associated with positive change in pain status and depression symptoms (James & Large, 1992).
One theory that may be useful in explaining how people react to certain situations such as chronic pain/illness is Kelly’s Personal Construct Theory (1955), which posits that each individual develops a unique understanding of his or her own world, which ultimately determines the person’s response to situations. People who have not experienced chronic illness before build their understanding of illness around previous experience of acute illness or generalized events. Thus, an individual’s ability to adjust to chronic illness can be partially determined by the distance between illness self-construct and previous construction of self (Viney, 1985). When dealing with chronic illness, these constructs may need to be revised in order for effective treatment or rehabilitation to take effect.

In the dyads studied by James and Large (1992), there were issues that could have been explored in a treatment setting. For instance, issues such as both respondents viewing illness in the same way, but not realizing that they agreed about their perception of illness. This misperception is likely due to a developing pattern of avoiding discussions about illness around disabling chronic pain, which limits general communication between the couple. When exposed to the appropriate therapeutic intervention, these participants may improve their understanding of each other, and incongruities in the perception of illness might also provide a useful focus for initiating change and rehabilitation (James & Large, 1992).

Couples dealing with chronic pain must manage more than the typical conflicts and stressors that arise in all marriages. They are also faced with marital adjustments stemming from the chronic pain illness such as job and role changes, financial stressors, and impaired sexual functioning. Research by Rowat and Knafl (1985) reported that a
significant number of spouses of chronic pain patients try to reduce tension and conflict levels within the marriage as a way of managing the patient’s pain, attempting to protect them from stressful situations. Thus, a relationship may develop between marital stress and pain behaviors. To date, limited research has been conducted to examine the role of pain behavior in pain couples’ responses to marital stress and conflict and how this may be associated with the patient’s overall functioning and adaptation to chronic pain.

Research conducted by Schwartz, Slater and Birchler (1996) indicated that negative spouse behaviors were more predictive of patient impairment rather than solicitous behaviors by spouses, which contradicts previous research on chronic pain producing a positive correlation between solicitous spouse responses, patient’s pain and impairment variables (Flor et al. 1987; Romano et al. 1992). Results suggest that it may be useful for pain couples to assess both conflict management within the relationship and the spouse’s feelings and behavioral responses regarding the patient’s pain.

Shortcomings noted in this study are the limited generalizability based on all male participants and a limited sample of participants in an outpatient setting receiving pain management care. Further research is indicated to systematically evaluate how marital conflict, in particular, and interpersonal stress in general, may contribute to the maintenance and exacerbation of the chronic pain patient’s physical disability and emotional suffering (Schwartz et al. 1996).

Naturally, when one spouse is burdened with a physically disabling health condition, the life patterns of both spouses are transformed, causing both to alter their roles in the marital relationship. The degree to which people with chronic pain interact with their spouses and accommodate the necessary adjustments together has a significant
influence on the quality of their relationship. Research by Roberto (2001) found that the actual level of disability resulting from the patient’s chronic pain has limited influence on the spousal relationship if the couple either believes they have successfully adjusted to their modified roles, or if intimacy within the relationship is satisfactory prior to the onset or progression of the pain. Thus, it is important for practitioners to consider the chronic pain experience from both the patient’s viewpoint and from the perspective of the spouse, who will likely be relied upon for increased instrumental and emotional support. Providing intervention or educational programs that focus on the marital system can help promote effective communication between the spouses and help each member of the dyad develop successful coping strategies for managing their family’s unique situation (Roberto, 2001).

A study conducted by Romano, Turner and Clancy (1989) examined sex differences in the relationship of pain patient dysfunction to spousal marital and emotional adjustment based on patient and spouse ratings. The results of this study indicated a significantly stronger relationship between the spouse’s perception of patient dysfunction and spousal emotional and marital adjustment in male versus female patient couples. Although the majority of female spouses did not fall within the clinically depressed range, they were no less emotionally distressed and were significantly less satisfied with their marriages when compared to their patient husbands. The opposite pattern was found in female patient couples. Male spouses were significantly less depressed than their patient wives and no less satisfied with their marriages (Romano, Turner, & Clancy, 1989). These results raise some important questions as to why a stronger relationship exists between patient disability and spousal/marital adjustment in
male patient couples versus female patient couples. Furthermore, this may also point to
gender differences in responses to and reinforcement of pain behaviors, which may be
worth studying further. Data on work status of spouses was not available in this study,
which may also be an important variable to examine in future research.

**Research Questions**

To guide this study more precisely, the statement of the problem was broken into
eleven specific research questions, which are organized into three groups. Each group of
questions is described briefly below.

The first set of research questions explore the relationship between injured
workers’ pain catastrophizing, their perception of their partners’ responses to their pain
behaviors, and their partners’ self-reported responses to the pain behaviors. In addition,
the relationship between the injured workers’ relationship satisfaction and that of their
partners’ will be analyzed.

1a. Among injured workers suffering from chronic pain, what is the relationship
between the injured workers’ rating of total pain catastrophizing and perceived
partner responses to pain behaviors (i.e., support, punishing responses, solicitous
responses, and distracting responses)?

1b. Among injured workers suffering from chronic pain and their partners, what
is the relationship between the injured workers’ rating of total pain
catastrophizing and their partners’ rating of responses to pain behaviors (i.e.,
punishing responses, solicitous responses, and distracting responses)?
2a. Among injured workers suffering from chronic pain, what is the relationship between the injured workers’ rating of total pain catastrophizing and the injured workers’ rating of total relationship satisfaction?

2b. Among injured workers suffering from chronic pain and their partners, what is the relationship between the injured worker’s rating of total pain catastrophizing and the injured workers’ partner’s rating of total relationship satisfaction?

3. Among injured workers suffering from chronic pain and their partners, what is the relationship between the injured workers’ rating of total relationship satisfaction and the injured workers’ partners’ rating of total relationship satisfaction?

The next set of research questions address gender differences. Specifically, the gender differences among injured workers’ rating of relationship satisfaction and partners’ rating of relationship satisfaction will be analyzed. In addition, gender-specific responses to the injured worker’s pain behaviors will be compared.

4a. Among injured workers suffering from chronic pain and their partners, what is the difference between the male and female injured worker’s rating of total relationship satisfaction with their partner?

4b. Among the partners of injured workers suffering from chronic pain, what is the difference between the male and female partner’s rating of total relationship satisfaction?
5a. Among injured workers suffering from chronic pain, what is the difference between the male and female injured worker’s rating of total pain catastrophizing?

5b. Among injured workers suffering from chronic pain, what is the difference between the male and female injured worker’s perception of partner’s response to pain behaviors (support, punishing responses, solicitous responses, and distracting responses)?

5c. Among the partners of injured workers suffering from chronic pain, what is the difference between the male and female partner’s response to pain behaviors (punishing responses, solicitous responses, and distracting responses)?

The final research question will address the dynamics of the injured worker’s partner. Specifically, the relationship between the partner’s response to the injured worker’s pain behaviors and their own relationship satisfaction will be analyzed.

6. Among the partners of injured workers suffering from chronic pain, what is the relationship between the injured worker’s partner’s rating of responses to pain behaviors (punishing responses, solicitous responses, and distracting responses) and partner’s rating of total relationship satisfaction?
Chapter II

Methodology

This chapter will discuss the methodology of the study. First, a detailed description of the population and sample will be presented. Second, the three classes of variables (pain catastrophizing, partner response to pain behaviors, and relationship satisfaction) will be explained in relation to the specific instruments used to measure these variables. Third, the design of the study will be illustrated in table format. Finally, the procedure of the study will be outlined to include recruitment, data collection, and a detailed description of the data analysis as it applies to the research questions posed.

Population and Sample

The population for this study was defined to include married male and female injured workers suffering from a chronic pain condition in response to an industrial injury, and who were being treated with individual psychotherapy for a diagnosed psychological condition (according to DSM-IV-TR criteria) in a private practice setting. The spouses of these injured workers were also included in the study. To qualify for participation in this study, the subjects had to have been in psychotherapy treatment for at least one year, and had to have been married to their spouse for at least five years. For the purposes of this study, the sample consisted of male and female participants who were married and heterosexual in orientation. In addition, every effort was made to diversify the participants studied according to gender, race and age group. The sample consisted of a total of 20 patients who had been receiving psychotherapy services in a Midwestern, urban private practice setting and their spouses. The most common pain conditions suffered by these patients include chronic pain due to a back, neck or knee
injury; or soft tissue injuries. The most common psychological conditions these patients are afflicted with include the following: Depressive Disorder NOS; Anxiety Disorder NOS; Major Depressive Disorder; Dysthymic Disorder; Posttraumatic Stress Disorder; Pain Disorder Associated With Both Psychological Factors and a General Medical Condition; and an Adjustment Disorder. In other words, the diagnosed psychological condition was reactive versus cyclical in response to the industrial injury suffered and its negative sequelae.

**Variables**

This study focused on the relationship between three general classes of variables: pain catastrophizing, partner response to pain behaviors, and relationship satisfaction. To assess these general classes of variables, the injured worker completed the Pain Catastrophizing Scale, The West-Haven Yale Multidimensional Pain Inventory, and the Dyadic Adjustment Scale; while the injured worker’s partner completed The West-Haven Yale Multidimensional Pain Inventory For Significant Others and the Dyadic Adjustment Scale.

**Pain Catastrophizing.** The first general class of variables, pain catastrophizing, was defined conceptually as variables that assess having a negative or exaggerated focus on pain. This class of variables was measured by the total score of The Pain Catastrophizing Scale (PCS) developed by Sullivan, Bishop, and Pivik (1995), a 13-item scale for use in assessing catastrophizing in clinical and nonclinical populations. Each item was rated on a 5-point scale: 0 (not at all) to 4 (all the time). Three factors or subscales identified from this scale were rumination, magnification, and helplessness. This scale has been shown to have good internal consistency reliability and criterion-
related validity when rating the PCS total and subscales across clinical and nonclinical
samples (D’Eon, Harris, & Ellis, 2004; Osman et al., 2000; Sullivan et al., 1995). In
terms of gender differences; however, only the PCS total score has been consistently
shown to differentiate the responses of clinical women from clinical men (Osman et al.,
2000). Therefore, only the PCS total score was used for the purposes of this study. The
injured worker completed this assessment, which takes approximately 5 minutes.

Partner Response to Pain Behaviors. The second general class of variables
focused on the spouse of the injured worker, and their response to the injured worker’s
pain behaviors. This was assessed both from the injured workers’ perspective and the
spouse’s perspective, using separate measurements. Specifically, partner response to
pain behaviors from the injured worker’s perspective was measured by The West-Haven
Yale Multidimensional Pain Inventory (WHYMPI) developed by Kerns, Turk and Rudy
(1985), which is comprised of 3 sections and 13 scales that examined the impact of pain
on the patients’ lives (section 1), the responses of significant others to the patients’
communication of pain (section 2), and the extent to which patients participated in
common daily activities (section 3). Section 1 of the WHYMPI consists of 5 scales: pain
severity, interference, life control, affective distress, and support and has 28 items to
complete in Likert scale format from 0 to 6. Section 2 consists of 3 scales: solicitous
responses, punishing responses, and distracting responses and has 14 items to complete
on a 7-point scale: 0 (never) to 6 (very often). Finally, section 3 consists of 5 scales:
household chores, outdoor work, activities away from home, social activities, and general
activity and has 19 items to complete on a 7-point scale: 0 (never) to 6 (very often). The
development and psychometric properties of the WHYMPI have been widely reported
(Sharp & Nicholas, 2000; Kerns et al., 1985; Kerns & Jacob, 1992). It was directly derived from the cognitive-behavioral model of chronic pain (Turk et al., 1983). It has been shown to have good reliability and validity (Kerns, Turk, & Rudy, 1985), is generalizable (Kerns & Haythornthwaite, 1986), and can be used to assess the role of psychosocial factors in a range of pain conditions (Turk et al., 1983). Kerns, Turk, and Rudy (1985) demonstrated that the internal reliability coefficients of all WHYMPI scales range from .70 to .90; the test-retest reliabilities of these scales over a 2-week interval ranged from .62 to .91. The validity of the WHYMPI has been supported by the results of confirmatory and exploratory factor analytic procedures (Kerns & Rosenberg, 1995). The procedures revealed that the WHYMPI scales were significantly correlated with several criterion measures of anxiety, depression, marital satisfaction, pain severity, and health locus of control. It is also quick for patients to complete and can be scored by hand or computer (Rudy, 1989). The injured worker completed this assessment, which took approximately 15-20 minutes. Scale scores were calculated by averaging the item responses.

Partner response to pain behaviors from the spouse’s perspective was measured by the West-Haven Yale Multidimensional Pain Inventory For Significant Others (WHYMPI-SO) developed by Flor, Turk and Sholtz (1987), which is comprised of 2 sections and 8 scales. Section 1 assesses the spouse’s perceptions of the degree to which pain is impacting upon theirs and their partner’s life and consists of 5 scales: significant others’ perception of patient interference, significant others’ own interference, significant others’ life control, significant others’ affective distress, and support. Section 2 assesses spouse’s reports of their own responses when their partner is in pain. Consistent with the
patient version, the 3 scales included punishing, solicitous and distracting responses. Scoring of the Significant Other version was similar to the patients’ version, with each item requiring a response on a 7-point scale (0 = no change to 6 = extreme change; or 0 = never to 6 = very often). As with the patients’ version, scale scores were calculated by averaging the item responses. The spouses completed this assessment, which took approximately 10-15 minutes.

**Relationship Satisfaction.** The final general class of variables focused on the degree to which the marital partner is satisfied with the quality of their relationship. In this study, relationship satisfaction was measured by the Dyadic Adjustment Scale (DAS), developed by Spanier (1976). This 32-item instrument was designed to assess the quality of the relationship as perceived by married or cohabitating couples. Factor analysis indicated that the instrument measures four aspects of the relationship: dyadic satisfaction, dyadic cohesion, dyadic consensus, and affectional expression. This instrument distinguishes itself from other measures of marital adjustment in that it can be used by unmarried partners and homosexual couples. The items ask participants to rate the extent to which they and their partner agree or disagree on a range of issues, such as family finances, sex relations, and household tasks. The items were rated on a 6-point scale, from 0 = (always disagree) to 5 = (always agree). Some items also assess the frequency with which the pair engage in specific interactions, such as quarreling or confiding in each other. In these cases, items are mostly rated from 1 = (all the time) to 6 = (never), although some are rated on a 1-5 or 0-4 scale. The DAS has been widely used and established as a measure of marital adjustment (Bagarozzi, 1985; Spanier, 1976). Scoring involved summing the responses. Total scores can range from 0 to 151. Higher
scores indicate a greater degree of marital adjustment. Both the injured worker and their spouse individually completed this assessment. It took approximately 10-15 minutes to complete.

**Design**

The design for this associational study had one factor in the design over participants and gender of the injured worker; and one factor in the design over measures and dyadic role (i.e., injured worker, domestic partner). See Table 1 for an illustration of this design.
Table 1

*Design for Data Collection*

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Injured Worker</th>
<th>Domestic Partner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construct</td>
<td>Pain Catastrophizing</td>
<td>Perception of Spouse Response to Pain</td>
</tr>
<tr>
<td>Instrument</td>
<td>PCS</td>
<td>WHYMPI</td>
</tr>
<tr>
<td>Scale(s)</td>
<td>Total Score</td>
<td>Pain Severity Interference</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Life Control</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Affective Distress</td>
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<tr>
<td></td>
<td></td>
<td>Support</td>
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<tr>
<td></td>
<td></td>
<td>Punishing Reponses</td>
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<tr>
<td></td>
<td></td>
<td>Solicitous Responses</td>
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<tr>
<td></td>
<td></td>
<td>Distracting Responses</td>
</tr>
<tr>
<td>Gender of Injured Worker</td>
<td>Male</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* PCS = Pain Catastrophizing Scale, WHYMPI = West-Haven Yale Multidimensional Pain Inventory, DAS = Dyadic Adjustment Scale, WHYMPI-SO = West-Haven Yale Multidimensional Pain Inventory For Significant Others.
**Procedure**

**Recruitment.** The patients recruited for this study were obtained from various service providers within the private practice setting selected, including the researcher. The researcher took special care when recruiting patients, so as not to coerce participation of the patients in any way. For instance, the researcher made clear to the patient that this was strictly a voluntary opportunity for them and their spouse, and that absolutely no repercussions would result if they chose not to participate. To ensure that this study of a vulnerable population of injured workers suffering from chronic pain and psychological distress adhered to the standards for ethical treatment of human research participants, recruitment was conducted according to a strict, informed consent protocol. For instance, a specific script was used for the researcher during the recruitment process, and a separate script for other providers who took part in the recruitment process was used (see Appendix A). All providers who recruited participants were either licensed professional clinical counselors or psychologists who provided psychotherapy and pain management services to injured workers within the research site.

Initially, the researcher personally introduced this study to other service providers within the designated private practice setting in an effort to elicit assistance in the recruitment of qualified participants (see Appendix A). In addition, a letter of informed consent was given to providers, which explained the purpose and proceedings of the study in more detail (see Appendix B). Participants recruited by mental health professionals within the research site were injured workers suffering from chronic pain and a diagnosed mental disorder (see Population and Sample section under Methodology), who had been receiving outpatient psychotherapy services within the
private practice setting for a minimum of one year, and who had been married to their spouse for a minimum of five years.

Mental health professionals asked qualifying patients if they would like to participate in a study with other patients within the private practice for research purposes and gave a general overview of the purpose of the study (see Appendix A). The mental health professional also made clear that the patient’s spouse would also need to participate for the purpose of the study. Once the patient and patient’s spouse agreed to participate in the study as a couple, the name and phone number of the willing participants was forwarded to the researcher by the recruiter. The researcher then contacted the participants who expressed initial interest by phone (or in person if able) to confirm their qualifications and provide complete information about the study. The researcher also took part in the recruitment process by contacting her own qualifying patients in person or by phone (see Appendix A) and, if a qualifying patient expressed initial interest, provided a detailed description of the study immediately. Prior to the collection of any data, the researcher asked the recruit to sign a document acknowledging their informed consent (see Appendix B). Once this was established, a convenient time was set up by the researcher for the participants to complete the assessments used for data collection.

**Data Collection.** The actual data generated from participants in the study was obtained by the researcher. The assessments were either completed in a testing room within the private practice setting, or at the participant’s home. Assessments which were completed at the participant’s home were mailed (postage pre-paid) back to the researcher. The assessments completed by the injured worker (Pain Catastrophizing
Scale, West-Haven Yale Multidimensional Pain Inventory, and Dyadic Adjustment Scale) took a total of approximately 35-40 minutes. The assessments completed by the spouse (West-Haven Yale Multidimensional Pain Inventory For Significant Others and Dyadic Adjustment Scale) took a total of approximately 30 minutes. Once the assessments were completed by participants, the researcher scored the assessments, entered the scores and demographic data into an electronic database, and stored the raw data protocols in a locked file box at the researcher’s home until the study was completed.

**Data Analysis.** The data for this study was analyzed in three steps. First, the Pearson product-moment correlation was calculated among the relationships between variables measured and tested for significance. Then, a *t*-test was planned to be used to compare the mean differences between genders. Finally, the Pearson product-moment correlation coefficient was computed to assess the relationship between variables.

The following is a more detailed description of how each research question was analyzed using the appropriate statistical procedures. Research questions 1a.-3, which asked about the relationships between injured worker pain catastrophizing, injured worker and spouse responses to pain behaviors, and injured worker and spouse relationship satisfaction was answered by calculating the Pearson product-moment correlation (*r*<sub>xy</sub> and testing it for significance). For research questions 4a.-5c., a *t*-test was intended to be used to compare mean differences between the genders. Specifically, gender differences among injured worker’s and their spouse’s relationship satisfaction, injured worker’s pain catastrophizing, injured worker’s perception of their spouse’s response to pain behaviors, and spouse’s response to pain behaviors was intended to be
compared. However, this was not possible due to an imbalanced gender sample, which will be explained in more detail in Chapter III. Research question 6, which asked about the relationship between the spouse’s responses to the injured worker’s pain and spouse’s relationship satisfaction, was assessed by computing the Pearson product-moment correlation coefficient.
Chapter III

Results

This chapter presents the results of the study. First, each of the research questions is presented and explored according to the analytical plan outlined in Chapter II. For each question, a conclusion was drawn about whether a hypothesis of no significant relationship was or was not rejected. Following the tests necessary to answer the research questions, a McQuitty Linkage Analysis (McQuitty, 1957) was performed to describe the patterning of the correlations computed among the pain catastrophizing, pain behavior, and relationship satisfaction variables. Finally, a summary of the findings is presented.

Tests of Research Questions

Each research question tested is identified by the method used and result of the statistical calculation performed. Next, a conclusion was drawn about whether a hypothesis of no significant relationship was or was not rejected. The first set of research questions (1a-3) explored relationships between the injured worker’s pain catastrophizing, their perception of their partner’s responses to their pain behaviors, and their partner’s self-reported responses to the pain behaviors. In addition, the relationship between the injured worker’s relationship satisfaction and that of their partner’s was assessed. The first three research questions were tested using the Pearson product-moment correlation.

Question 1a. Among injured workers suffering from chronic pain, what is the relationship between the injured workers’ rating of total pain catastrophizing and perceived partner responses to pain behaviors (i.e., support, punishing, solicitous, and
It was expected that as the injured worker’s pain level increases, their perception of their partner’s level of distress will increase, leading to a distressed and/or punitive response style. This research question was tested using the Pearson product-moment correlation between the injured worker’s total score on the Pain Catastrophizing Scale and injured worker’s perception of their partner’s scores on the support, punishing responses, solicitous responses, and distracting responses subscales of the West-Haven Yale Multidimensional Pain Inventory. The result of the Pearson product-moment correlation revealed no significant relationship between the injured worker’s total score on the Pain Catastrophizing Scale and injured worker’s perception of their partner’s scores on the support (r = -.28, df = 18, p > .05), punishing responses (r = .22, df = 18, p > .05), solicitous responses (r = -.29, df = 18, p > .05), and distracting responses (r = .12, df = 18, p > .05) subscales of the West-Haven Yale Multidimensional Pain Inventory. Therefore, this hypothesis of no relationship was not rejected as there was no significant relationship found between the variables tested.

**Question 1b.** Among injured workers suffering from chronic pain and their partners, what is the relationship between the injured workers’ rating of total pain catastrophizing and their partners’ rating of responses to pain behaviors (i.e., punishing, solicitous, and distracting responses)? Theory suggests that as the injured worker’s pain level increases, their partner’s response style increases (punishing, solicitous, distracting). This research question was tested using the Pearson product-moment correlation between the injured worker’s total score on the Pain Catastrophizing Scale and partner’s scores on the punishing responses, solicitous responses, and distracting responses subscales of the West-Haven Yale Multidimensional Pain Inventory For Significant Others. The result of
the Pearson product-moment correlation revealed no significant relationship between the injured worker’s total score on the Pain Catastrophizing Scale and partner’s scores on the punishing responses \((r = .07, df = 18, p > .05)\), solicitous responses \((r = -.16, df = 18, p > .05)\), and distracting responses \((r = .05, df = 18, p > .05)\) subscales of the West-Haven Yale Multidimensional Pain Inventory For Significant Others. Therefore, this hypothesis of no relationship was not rejected as there was no significant relationship found between the variables tested.

**Question 2a.** Among injured workers suffering from chronic pain, what is the relationship between the injured workers’ rating of total pain catastrophizing and the injured workers’ rating of total relationship satisfaction? It was expected that as the injured worker’s pain level increases, the injured worker’s sense of relationship satisfaction with his or her partner will decrease. This research question was tested using the Pearson product-moment correlation between the injured worker’s total score on the Pain Catastrophizing Scale and injured worker’s total score on the Dyadic Adjustment Scale. The result of the Pearson product-moment correlation revealed a significant relationship between the injured worker’s total score on the Pain Catastrophizing Scale and injured worker’s total score on the Dyadic Adjustment Scale \((r = -.59, df = 18, p < .05)\). Therefore, this hypothesis of no relationship was rejected as there was a significant relationship found between the variables tested.

**Question 2b.** Among injured workers suffering from chronic pain and their partners, what is the relationship between the injured worker’s rating of total pain catastrophizing and the injured workers’ partner’s rating of total relationship satisfaction? It was expected that as the injured worker’s pain level increases, their
domestic partner’s sense of relationship satisfaction will decrease. This research question was tested using the Pearson product-moment correlation between the injured worker’s total score on the Pain Catastrophizing Scale and domestic partner’s total score on the Dyadic Adjustment Scale. The result of the Pearson product-moment correlation revealed a significant relationship between the injured worker’s total score on the Pain Catastrophizing Scale and domestic partner’s total score on the Dyadic Adjustment Scale ($r = -.55, df = 17, p < .05$). Therefore, this hypothesis of no relationship was rejected as there was a significant relationship found between the variables tested.

**Question 3.** Among injured workers suffering from chronic pain and their partners, what is the relationship between the injured workers’ rating of total relationship satisfaction and the injured workers’ partners’ rating of total relationship satisfaction? It was expected that as the injured worker’s sense of relationship satisfaction increases, their domestic partner’s sense of relationship satisfaction will increase. This research question was tested using the Pearson product-moment correlation between the injured worker’s total score on the Dyadic Adjustment Scale and domestic partner’s total score on the Dyadic Adjustment Scale. The result of the Pearson product-moment correlation revealed a significant relationship between the injured worker’s total score on the Dyadic Adjustment Scale and domestic partner’s total score on the Dyadic Adjustment Scale ($r = .56, df = 17, p < .05$). Therefore, this hypothesis of no relationship was rejected as there was a significant relationship between the variables tested.

The next set of research questions (4a-5c) address gender differences. Specifically, the gender differences among injured workers’ rating of relationship
satisfaction and their partners’ rating of relationship satisfaction were expected to be explored. In addition, gender-specific responses to the injured worker’s pain behaviors were to be compared. These research questions are as follows:

**Question 4a.** Among injured workers suffering from chronic pain and their partners, what is the difference between the male and female injured worker’s rating of total relationship satisfaction with their partner?

**Question 4b.** Among the partners of injured workers suffering from chronic pain, what is the difference between the male and female partner’s rating of total relationship satisfaction?

**Question 5a.** Among injured workers suffering from chronic pain, what is the difference between the male and female injured worker’s rating of total pain catastrophizing?

**Question 5b.** Among injured workers suffering from chronic pain, what is the difference between the male and female injured worker’s perception of partner’s response to pain behaviors (support, punishing, solicitous, and distracting responses)?

**Question 5c.** Among the partners of injured workers suffering from chronic pain, what is the difference between the male and female partner’s response to pain behaviors (punishing, solicitous, and distracting responses)?

Unfortunately, research questions 4a-5c were not able to be tested due to an imbalanced gender sample. The sampling plan provided for an equal number of male and female injured workers in order to adequately explore gender differences in this population; however, this did not happen for several reasons. Although the research site is slightly skewed toward male versus female injured workers (441 male and 254 female
injured workers), most clinicians have a more proportionate amount of male and female injured workers in their caseload. For instance, the researcher has 58 male injured workers and 54 female injured workers in her caseload. The researcher recruited 11 injured workers for this study, 1 of which was female. Secondly, the researcher had planned to recruit more injured workers from other clinicians at the research site for this study. Unfortunately, only three other clinicians participated in the recruitment process, resulting in a total of 9 injured workers recruited from other clinicians, 1 of which was female. As a result, the sample obtained for this study greatly favored male injured workers to female injured workers, 18 to 2, rendering statistical testing for these research questions impossible. It is unknown why more male injured workers were willing to participate in this study versus female injured workers. Some of the reasons given to the researcher for declining participation in the study by female injured workers included: (a) unwillingness of the spouse to participate, (b) resistance from the injured worker due to ‘test’ fatigue, (c) pain level, and (d) fears of confidentiality being compromised.

The next research question will address the dynamics of the injured worker’s partner. Specifically, The relationship between the partner’s response to the injured worker’s pain behaviors and their own relationship satisfaction was tested using the Pearson product-moment correlation coefficient.

**Question 6.** Among the partners of injured workers suffering from chronic pain, what is the relationship between the injured worker’s partner’s rating of responses to pain behaviors (punishing, solicitous, and distracting responses) and partner’s rating of total relationship satisfaction? Among the partners of injured workers suffering from chronic pain, it was expected that there would be a significant correlation between the
partner’s response style (punishing, solicitous, distracting) and sense of relationship satisfaction. This research question was tested using the Pearson product-moment correlation coefficient between the partner’s total score on the Dyadic Adjustment Scale and partner’s scores on the punishing responses, solicitous responses, and distracting responses subscales of the West-Haven Yale Multidimensional Pain Inventory For Significant Others. The result of the Pearson product-moment correlation revealed no significant relationship between the partner’s total score on the Dyadic Adjustment Scale and partner’s scores on the punishing responses \( (r = -.10, df = 17, p > .05) \), solicitous responses \( (r = .28, df = 17, p > .05) \), and distracting responses \( (r = .03, df = 17, p > .05) \) subscales of the West-Haven Yale Multidimensional Pain Inventory For Significant Others. Therefore, this hypothesis of no relationship was not rejected as there was no significant relationship found between the variables tested. See Table 2 for an illustration of the Pearson product-moment correlations.
Table 2

Pearson Product-Moment Correlations Between Pain Catastrophizing, Response to Pain Behaviors, and Relationship Satisfaction Variables Assessed Among Injured Workers and their Domestic Partners

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<th>WHYLC (iw)</th>
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<th>WHYI (iw)</th>
<th>WHYPR (iw)</th>
<th>WHYDR (iw)</th>
<th>WHYSR (iw)</th>
<th>WHYS (iw)</th>
<th>WHYAD (iw)</th>
<th>PCSTOT (iw)</th>
<th>DASTOT (iw)</th>
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Note. N = 20 for all data except N = 19 for DASTOT(dp), WHYSR(dp), WHYDR(dp), and WHYPR(dp) due to one domestic partner’s absence of data. WHYLC = West-Haven Yale Multidimensional Pain Inventory Life Control, WHYPS = West-Haven Yale Multidimensional Pain Inventory Pain Severity, WHYI = West-Haven Yale Multidimensional Pain Inventory Interference, WHYPR = West-Haven Yale Multidimensional Pain Inventory Punishing Responses, WHYDR = West-Haven Yale Multidimensional Pain Inventory Distracting Responses, WHYSR = West-Haven Yale Multidimensional Pain Inventory Solicitous Responses, WHYS = West-Haven Yale Multidimensional Pain Inventory Support, WHYAD = West-Haven Yale Multidimensional Pain Inventory Affective Distress, PCSTOT = Pain Catastrophizing Scale Total Score, DASTOT = Dyadic Adjustment Scale Total Score, iw = injured worker, dp = domestic partner. 
*p < .05  **p < .01
McQuitty Linkage Analysis

Elementary linkage analysis, developed by Louis McQuitty (1957), is a method of clustering homogeneous groups within complex data sets. This method is typically used when classifying people or items that have specific cluster characteristics. Linkage analysis is a typal structure defined as “one in which every member of a type is more like some other member of that type than like any member of any other type (McQuitty, 1957, p.209).” Once the members of a type have been clustered, it is then possible to assign a theme or prototype in which all members of the clustered type possess common characteristics.

The first step of elementary linkage analysis selects the members of the first type, which is determined by identifying for each item the one other item most like it, yielding the highest relationship. The relationships between these members, then, characterize data in the first matrix or cluster. The members of the second type are then selected, in which the relationships between these members characterize data in the second cluster. This method is repeated until every member or variable has been classified into a type and all relevant clusters have been identified. Once this is established, correlations can be determined among variables based upon single links between clusters. Advantages of using elementary linkage analysis versus other factor-analytic methods are its usefulness for investigating a particular theoretical position, its speed, and its objectivity (McQuitty, 1957). Furthermore, this analysis is useful in determining future research needed by revealing relationships not previously planned or hypothesized. The following describes the four clusters produced by the elementary linkage analysis.
Cluster I. The first cluster of variables involved three injured worker self-ratings for pain severity, life control, and interference, all of which were assessed by the West-Haven Yale Multidimensional Pain Inventory (WHYMPI). The primary link in this cluster was between pain severity and life control ($r = .74, p < .05$). The variable interference was modestly associated with life control ($r = .47, p < .05$). Thus, Cluster I can be conceptualized as follows: As the injured worker’s pain level increases, their internal sense of loss of life control increases. The common theme or prototype among these variables appears to be ‘loss of life control’, although it must be recognized that they are all self-assessment variables produced by a single instrument.

Cluster II. The second cluster also involved injured worker self-assessments of variables measured by the WHYMPI. The primary linkage occurred between the variables punishing responses and distracting responses ($r = -.66, p < .05$), an inverse relationship. The variable solicitous responses was inversely related to punishing responses ($r = -.64, p < .05$) and directly related to distracting responses ($r = .62, p < .05$). Additionally, the variables support ($r = .58, p < .05$) and affective distress ($r = .25, p < .05$) were linked with solicitous responses. Although the link between distracting responses and solicitous responses is a tertiary link, it suggests that the three variables (distracting responses, punishing responses, and solicitous responses) form a triad of linked variables, each accounting for between 32% and 44% of the variance in the other two. Thus, Cluster II can be conceptualized as follows: As the injured worker’s perception that their partner uses solicitous and distracting responses increases, the perception of punishing responses decreases. Furthermore, the injured worker’s perception of their partner’s use of solicitous responses is modestly associated with
perceived support by the partner, but only weakly by the injured worker’s perceived affective distress. The common theme among these variables appears to be ‘learned helplessness.’

**Cluster III.** The third cluster of variables involves a mix of instruments and respondents. The total score on two injured worker self-assessments, the Pain Catastrophizing Scale (PCS) and the Dyadic Adjustment Scale (DAS), produced the primary linkage \(r = -.59, p < .05\), an inverse relationship. This suggests that the injured worker’s pain catastrophizing is moderately associated with his or her sense of relationship satisfaction, meaning that a higher pain experience produces a lower sense of relationship satisfaction. The total score on the domestic partner self-assessment, DAS, was also linked to the total score on the injured worker self-assessment, DAS \(r = .56, p < .05\), indicating that the injured worker’s sense of relationship satisfaction is moderately associated with their domestic partner’s sense of relationship satisfaction. Finally, a link occurred between the total score on the domestic partner self-assessment, DAS, and the total score on the injured worker self-assessment, PCS \(r = -.55, p < .05\), an inverse relationship. This suggests that the injured worker’s pain catastrophizing is moderately associated with their domestic partner’s sense of relationship satisfaction. Interestingly, this relationship was closely associated with the primary linkage in this cluster, indicating that both the injured worker’s sense of relationship satisfaction and their domestic partner’s sense of relationship satisfaction are similarly affected by the injured worker’s level of pain catastrophizing. Thus, the common theme among these variables appears to be ‘quality of relationship.’
Cluster IV. The fourth cluster of variables involved three domestic partner self-assessments for solicitous responses, distracting responses, and punishing responses, all of which were assessed by the West-Haven Yale Multidimensional Pain Inventory For Significant Others (WHYMPI-SO). The primary link in this cluster was between the variables solicitous responses and distracting responses \((r = .51, p < .05)\). There was also a modest association between the variables punishing responses and solicitous responses \((r = .43, p < .05)\). The common theme among these variables appears to be ‘response style.’ While it is indicated that solicitous behavior is the favored response among domestic partners when the injured worker is in pain, these are again all self-assessment variables produced by a single instrument.

In addition to identifying these four clusters of variables, several tertiary linkages emerged across clusters. Among clusters, significant relationships exist between the following variables: The injured worker’s total score on the PCS was modestly related to interference, a WHYMPI variable also assessed by the injured worker \((r = .47, p < .05)\). Also, the injured worker’s rating of solicitous responses on the WHYMPI was modestly related to the domestic partner’s total score on the DAS \((r = .49, p < .05)\) and to their own total score on the DAS \((r = .54, p < .05)\).

Summary

Of the eleven research questions that were posited, five were not analyzed due to insufficient data. The five research questions that were not analyzed centered around gender comparisons. Since most all of the subjects studied were male injured workers, there was an insufficient balance of data to compare for analysis. Of the six research questions that were tested, one statistical method was used, the Pearson product-moment
correlation. Three of the six research questions analyzed resulted in hypotheses that were rejected due to significant relationships between injured worker and partner total scores on the Pain Catastrophizing Scale and Dyadic Adjustment Scale self-assessments.

Finally, the McQuitty Linkage Analysis was introduced and analyzed as it applied to the four clusters formed by the variables measured. See Figure 1 for a graphic illustration of the McQuitty Linkage Analysis.
Figure 1. McQuitty Linkage Analysis
Chapter IV

Discussion

The final chapter conceptualizes relevant findings of the study and identifies areas for future research. First, a review of the statement of the problem, why the problem is important, and planned methodology is presented. Next, a summary of the findings is presented in the context of literature, noting supportive and contradictory results. Also, the four clusters identified from the McQuitty Analysis are analyzed in terms of the validity and reliability of the instruments utilized. Finally, limitations of the study as a whole are presented in terms of internal and external validity, generalizability, and suggestions for future research.

Summary

The overarching question to be answered in this study was: What is the relationship between the injured worker’s pain catastrophizing and sense of relationship satisfaction, and his or her partner’s responses to the injured worker’s pain behaviors and sense of relationship satisfaction? The study was designed to expand on existing literature on the chronic pain patient. Thus, the population selected for this study is specific to the special circumstances of the injured worker receiving psychological treatment in a private practice setting. In addition, relationship satisfaction was explored from the perspective of the injured worker and the injured worker’s spouse. The importance of this study was supported by several factors: (a) the population of persons suffering from chronic pain is alarmingly prevalent, and the social cost associated with chronic pain sufferers continues to grow, (b) despite expansion of the treatment modalities for chronic pain sufferers, the problem of injured worker chronic pain
continues to appear intractable, and (c) chronic pain among injured workers has received only minimal attention to date in the existing literature.

The population for this study was male and female injured workers suffering from a chronic pain condition in response to an industrial injury, and who received individual psychotherapy for a diagnosed psychological condition in a private practice setting. The spouses of these injured workers were also involved in the study. To be included in the sample, the injured worker had to have received individual psychotherapy services within the private practice setting for a minimum of one year, and had to have been married to their spouse for a minimum of five years. Unfortunately, the sampling plan failed to yield a balanced sample of male and female injured workers. Due to unforeseen problems with the recruitment process, the sample obtained consisted primarily of male injured workers and their spouses. Originally, the plan was to recruit approximately 50 couples, and the final number of participants was, in fact, half of the expected sample size.

Three classes of variables were the focus of this study: pain catastrophizing, partner response to pain behaviors, and relationship satisfaction. These variables were assessed by having the injured workers complete the Pain Catastrophizing Scale, The West-Haven Yale Multidimensional Pain Inventory, and the Dyadic Adjustment Scale. The spouses completed The West-Haven Yale Multidimensional Pain Inventory For Significant Others and the Dyadic Adjustment Scale.

The patients recruited for this study were obtained from various service providers within the selected private practice setting, including the researcher. To ensure that this study of a vulnerable population adhered to the standards for ethical treatment of human
research participants, recruitment was conducted according to a strict, informed consent protocol, which can be found in Appendix B. Once the data generated from participants in the study was obtained by the researcher, the researcher hand-scored the assessments and entered them into an electronic database for data analysis. The raw data was stored in a locked file box within the researcher’s home.

Originally, the design for this associational study had one factor in the design over participants (i.e., gender of the injured worker-male or female); and one factor in the design over measures (i.e., dyadic role-injured worker or spouse). However, with the failure of the sampling plan, the partitioning of the sample by gender was eliminated from the design. Thus, while research questions addressing gender differences were not tested, research questions based on the relationship between the various pain catastrophizing, pain behavior, and relationship satisfaction variables were addressed by computation of Pearson product-moment correlation coefficients. Significant relationships were found between injured worker total scores on the Pain Catastrophizing Scale and injured worker and spouse total scores on the Dyadic Adjustment Scale self-assessments.

Additional analysis of the pattern of relationships among the pain catastrophizing, pain behavior, and relationship satisfaction variables was undertaken by performing a McQuitty Linkage Analysis. This analysis revealed four clusters among the variables measured. An analysis of these findings will now be presented in the context of relevant literature.

**Pain Catastrophizing and Spouse Responsiveness**
Mainstream theory suggests that certain response styles from significant others, namely solicitous responses, yield more pain behaviors and impairment in persons with chronic pain (McCracken, 2005). However, a study conducted by Schwartz, Slater, and Birchler (1996) found that negative spouse behaviors (punishing) were more predictive of patient impairment than solicitous behaviors.

A majority of the literature supports a relationship between catastrophizing as assessed by the Pain Catastrophizing Scale and solicitous responses from others (Sullivan et al., 2000; Giardino et al., 2003). In accordance with the communal coping perspective previously mentioned, individuals with chronic pain may communicate distress to garner support and intimacy from significant others by verbalizing catastrophic thoughts or engaging in catastrophizing behaviors. Spouses, then, may reinforce this catastrophizing behavior by providing emotional and pain-specific support because they believe that their loved one is making reasonable requests for help. However, spouses may withdraw from or react negatively to catastrophizing after these attempts to be helpful are unsuccessful and become a source of frustration. Therefore, pain catastrophizing can be assumed to be related positively to perceived support in the early stages of the pain problem, but negatively to support at longer pain durations. This theory was expanded on by Cano (2004), who examined this relationship incorporating pain duration as a moderator and distress as a mediator of this relationship. Her results supported a relationship between pain catastrophizing and increased perceptions of pain-specific spousal support in pain patients with shorter pain durations; however, no significant relationship was found for longer pain durations, contrary to her prediction.
A study by Boothby et al. (2004) confirmed a significant relationship between pain catastrophizing and perceived negative or punishing partner behavior. Thus, pain patients scoring higher on a measure of catastrophizing perceived their partners as responding to their pain with irritation, frustration and anger. Interestingly, pain duration was not a significant factor in these results; however, it suggests that over time partners may have learned that catastrophizing does not necessarily signal important information, and may instead perceive patients’ repeated expressions of pain as manipulative, controlling, or maladaptive. Similar findings were substantiated in a later study by Buenaver et al. (2007), in which catastrophizing was more strongly associated with perceived punishing responses than with perceived solicitous responses. Given these findings, it was expected that in this study as the injured worker’s pain behavior increases, their perception of their partner’s level of distress will increase, leading to a negative and/or punitive response style. Research questions 1a and 1b tested these hypotheses of correlation, which revealed no significant relationship between these variables, either from the perspective of the injured worker or the spouse. This was contrary to what was expected, and conflicts with previous research on pain catastrophizing and spouse responsiveness. Although no relationship of significance was found in this study, findings suggest that a larger sample size may have produced a significant correlation between the injured worker’s pain catastrophizing and their perceived punishing responses from spouses, which is consistent with the research.

There are several possible explanations for the incongruent results of research questions 1a and 1b compared to previous research. Obviously, there are issues with the sampling in this study, both in size and gender balance. A larger sample size was used in
the Boothby et al. (2004) study (62 versus 20 in this study). Interestingly, the sample in Boothby’s study was more heavily skewed toward women than men (42 women and 20 men); however, no significant gender effect was found. A much larger sample size is needed to adequately assess the influence of gender on pain catastrophizing and spouse responsiveness, as this remains unclear. Also of importance is the fact that patients from this study were recruited from a private practice setting specializing in the treatment of psychological disorders associated with chronic pain; whereas the patients in Boothby et al.’s study were recruited from a medical center specializing in outpatient pain treatment. Therefore, these two samples of chronic pain patients may not have the same characteristics in terms of psychological status, employment status, or education.

Another explanation for the difference in findings from previous research such as Boothby et al. is the addition of a measurement completed by spouses to validate the pain patient’s perception of responsiveness to catastrophizing. The contradictory results suggest that (a) the patient and spouse hold strongly differing perceptions of how they respond to pain behaviors, and (b) the pain patient’s perception of response style from spouses is more subjective and that the actual spouse responses are more objective in measuring spouse responsiveness to pain catastrophizing. Additional replications of this study are needed to further explore this theory.

Still another aspect of this study to consider when interpreting the data results is the role of depression in an interpersonal conceptualization of pain catastrophizing. Taking into account the literature on depression, catastrophizing and chronic pain (Coyne, 1976; Keefe et al., 2003; Sullivan et al., 1998), it was surprising that pain catastrophizing was not significantly related to perceived negative spouse responses in
this study since others often respond to a distressed person in negative ways. Other research findings suggest that punishing spouse responses are more typically related to depressive symptoms and affective distress versus pain severity and disability (Kerns et al., 1990), which indicate that both depressive symptoms and perceived punishing spouse responses are independently associated with pain catastrophizing and not operating as mediators of one another in the relationship with pain outcomes. Although the status of the patient’s psychological condition was not measured in this study, it should be noted that the patients in this sample were all being treated for a diagnosed psychological condition. Therefore, this would be an important component to examine in future research on pain catastrophizing and spouse responsiveness.

**Pain Catastrophizing and Relationship Satisfaction**

A principal question this study wanted to answer was the degree of correlation between the injured worker’s pain catastrophizing and sense of relationship satisfaction and the injured worker’s spouse’s response to pain behaviors and sense of relationship satisfaction. It was expected that as the injured worker’s pain outcome increases, the injured worker’s sense of relationship satisfaction with his or her spouse will decrease, as well as the spouse’s sense of relationship satisfaction (research questions 2a and 2b respectively). As predicted, a significant relationship was found between the injured worker’s total score on the Pain Catastrophizing Scale and injured worker’s and spouse’s total scores on the Dyadic Adjustment Scale. These correlations were impressive, given that the sample size was small and skewed toward the male gender.

These results are consistent with previous research by Flor, Turk, and Scholz (1987), in which 66% of male pain patients indicated that their marital relationship had
been negatively affected by the chronic pain problem with a significant reduction in marital satisfaction. These patients also reported deficits in marital communication and expressed a degree of non-commitment to marriage. The patients who indicated low marital satisfaction also had spouses who were dissatisfied with their marriage. These spouses also reported that they tended to respond to the patient’s pain in a manner that was less supportive and more punishing. The results of the present study, then, appear to further substantiate a correlation between increased pain catastrophizing and decreased relationship satisfaction among male pain patients and their spouses.

The results of this study are somewhat congruent with research by Kerns and Turk (1984) and Kerns, Haythornthwaite, Southwick, and Giller (1990), whose studies of predominantly male pain patients revealed a relationship between marital distress and depressive symptom severity. This relationship is intensified when alternative sources of social reward are limited, such as in the case of the debilitated pain patient. Kerns’ et al. (1990) study found that pain patients who experience a generally low level of marital satisfaction as well as a high frequency of punishing spouse responses contingent on demonstrations of pain are more likely to experience depressive symptoms. In contrast, it was interesting that among martially satisfied patients, perceptions of a high rate of punishing responses to pain were associated with a lower likelihood of depressive symptoms. Given this finding, one may hypothesize that selective ignoring or aversive responses to demonstrations of pain, when placed in the context of a high frequency of positive communication, may help to reduce the degree of pain and suffering experienced by the patient.
Alternatively, research by Schwartz et al. (1996) hypothesized a model that describes a negative cycle of marital conflict, avoidance, pain behavior and disability in which marital conflict may increase the patient’s display of pain behaviors, which in turn may be associated with negative affective responses and more punitive behaviors on the part of the spouse, which may then correlate with greater patient disability. High levels of distress in both the patient and spouse have been documented in pain research (Schwartz et al., 1991). Thus, it may be that individuals with similar character styles, including high distress levels, may gravitate toward each other and marry. Another explanation is that high distress levels in both partners may be a reaction to the disability of pain such as economic pressures, litigation, and disability disputes at the time of assessment. Further replication of these studies, including the present one, is needed to establish direction of causality among the complex interaction of pain catastrophizing and the marital relationship. The quality of the marital relationship prior to the pain problem is also unknown. In addition, the self-report data in these studies may potentially be influenced by factors such as social desirability, somewhat limiting the validity of the data. Finally, the lack of adequate female pain patients in these studies, along with the present one, limits the generalizability of these findings.

**Injured Worker and Spouse Relationship Satisfaction**

The degree to which injured worker’s sense of relationship satisfaction was congruent with their spouse’s sense of relationship satisfaction was explored in research question 3. It was expected that as the injured worker’s sense of relationship satisfaction increased, their spouse’s sense of relationship satisfaction would increase. As expected, a significant relationship was found between the injured worker’s total score on the Dyadic
Adjustment Scale and spouse’s total score on the Dyadic Adjustment Scale. Again, this correlation was substantial given the sampling limits in this study.

This finding is congruent with previous research by Turk et al. (1987), which indicated that pain patients and their spouses had similar views of their marital relationship and degree of relationship satisfaction. As noted in the previous section (Pain Catastrophizing and Relationship Satisfaction), patients who were less satisfied with their marriage had spouses who were also dissatisfied with their marriage. Marital satisfaction of the patients was best predicted by spouse’s solicitousness and own marital satisfaction, but also by patient’s pain levels. Spousal marital satisfaction was best predicted by the patient’s marital satisfaction as well as the spouse’s own mood, but not directly related to the patient’s pain, which would contradict findings in the present study. This would suggest that spouses’ marital satisfaction is not necessarily affected by patients’ chronic pain, but rather by the overall quality of the marital relationship and own emotional health. Thus, it can be argued that the more the patient is satisfied with their marriage, the spouse will also be materially satisfied.

**Gender Influences on Pain Catastrophizing and Relationship Satisfaction**

As previously mentioned, research questions 4a-5c, which intended to explore gender-specific differences in terms of pain catastrophizing, response to pain behaviors, and relationship satisfaction were unable to be tested due to an imbalanced gender sample. Previous research in this area (Flor, Turk & Rudy, 1989) has indicated that female spouses appear to be more distraught over their husband’s chronic pain than male spouses are about their wives’ condition. Thus, spouses may have differing response styles to pain catastrophizing depending upon the gender of the patient. Female spouses’
marital satisfaction has also been shown to be lower than male spouses’ marital satisfaction scores (Flor et al., 1989; Romano et al., 1989). Taking into account traditional views of gender role behavior, displays of distress by males and females are likely to produce differing social responses. For instance, depressed or distressed behavior in males may be seen as less ‘role appropriate’ than for females, and may meet with more negative social responses from others. Another study by Strunin and Boden (2004) found that among injured workers dealing with chronic pain, men and women experienced a loss of gendered social role, helplessness, and permanent loss of self and/or identity. Although the imbalanced sample in this study prevented further exploration of gender differences and roles, certain inferences can be made about the significant correlations found. For instance, the strong correlation between the injured worker’s pain behaviors and the spouse’s sense of relationship satisfaction confirms traditional gender theory in this area, indicating that wives tend to be more distressed about their husband’s pain and resulting distress. Further research in this area would be beneficial in clarifying gender differences in these relationships.

**Spouse Response to Pain Catastrophizing and Relationship Satisfaction**

The response style of the spouse (punishing, solicitous, and distracting) to the injured worker’s pain catastrophizing was explored in research question 6 in relation to the spouse’s sense of relationship satisfaction. It was expected that there would be a significant correlation between the spouse’s response style and sense of relationship satisfaction. However, no significant relationship was found between the spouse’s total score on the Dyadic Adjustment Scale and spouse’s scores on the punishing responses, solicitous responses, and distracting responses subscales of the West-Haven Yale
Multidimensional Pain Inventory For Significant Others, contrary to what was expected. This being said, results of this study indicate that a larger sample size would have likely found a relationship of significance between the spouse’s sense of relationship satisfaction and spouse’s solicitous responses, which is congruent with the literature at shorter pain durations.

This finding contradicts previous research (Schwartz et al., 1996), which found that spouses who report feeling more negatively about the patient’s pain are more likely to behave in a punitive style toward the patient when the patient displays pain behaviors. This theory has also been validated by pain patient’s perceptions, which indicate stronger relationships between catastrophizing and punishing responses at longer pain durations, and solicitous responses at shorter pain durations (Buenaver et al., 2007; Boothby et al., 2004; Cano, 2004).

A possible explanation for the conflicting data in this study versus the Schwartz et al. 1996 study is the much smaller sample size ($n = 20$ versus $n = 61$), which limits the generalizability of the results. It is also noteworthy that both patient samples were primarily male, which does not allow results to be generalized to female pain patients. Also, patients in the Schwartz study were recruited from a VA medical center versus an outpatient private practice setting in this study, which may indicate differing patient characteristics. In addition, patients in the Schwartz study were excluded if they had a co-existing medical illness, an organic mental disorder or affective disorder, or undergone major surgery within a year of assessment, which was not the case in this study, and may account for varying social roles and relationship status between the two.
samples. Finally, patients and their spouses in the Schwartz study were compensated $20 for their participation, which could explain the smaller sample size in this study.

In other research mentioned (Injured Worker and Spouse Relationship Satisfaction), spouse’s marital satisfaction was not directly related to patients’ pain, but was best predicted by patients’ marital satisfaction and spouse’s own mood (Flor et al., 1987). Furthermore, spouse’s mood was most influenced by how patients coped with their situation, followed by spouse’s sense of life control, and spouse’s own marital satisfaction. Therefore, this research indicates that neither patient’s pain levels nor spouse’s perception of patient’s pain directly relate to spouse’s mood or marital satisfaction. Expanding on this concept, a study by Schwartz et al. (1991) found that spouse’s mood and ultimate satisfaction with the marriage was related to the patient’s level of anger about their pain, indicating poor coping mechanisms. Thus, spouses with patients who experience high levels of pain and anger about their pain and limitations may begin to feel helpless and depressed. Learned helplessness theory (Abramson, Seligman & Teasdale, 1978) suggests that a perceived lack of control over important events in the environment may predispose individuals to depression. This can certainly be said about chronic pain patients and their spouses, who may feel they have little control over the patient’s behavior, and thus, their own lives. Considering these research findings on spouse response to patient’s pain and marital satisfaction, the results of the present study may make sense. However, further research is needed in this area to explore influencing factors such as patient’s coping style to their pain and the state of the spouse’s mood or mental health. In addition, more female patients are needed to assess the influence of gender on these variables.
In conclusion, the overarching question to be answered in this study was: What is the relationship between the injured worker’s pain catastrophizing and sense of relationship satisfaction, and his or her spouse’s responses to the injured worker’s pain behaviors and sense of relationship satisfaction? Results from this study indicate that (1a) as the injured worker’s pain behavior increases, their sense of relationship satisfaction with their spouse will decrease; (2b) as the injured worker’s pain behavior increases, their spouse’s sense of relationship satisfaction decreases; and (3c) as the injured worker’s sense of relationship satisfaction increases, their spouse’s sense of relationship satisfaction increases. Given the results of this study, it can be inferred that the injured worker’s pain catastrophizing is strongly related to the quality of the marital relationship, and that the spouse’s sense of relationship satisfaction is strongly correlated with the injured worker’s sense of relationship satisfaction. These findings are further illustrated within Cluster III of the McQuitty Linkage Analysis (see Figure 1).

Taking into account the unique circumstances of the injured worker’s chronic pain and resulting disability, their sense of relationship satisfaction may rely more on their expectations of their social roles as a provider and caretaker (as in this predominantly male sample). Thus, factors such as unemployment, economic pressures, litigation and disability disputes at the time of assessment may have influenced their sense of marital satisfaction as well as their spouses. Considering this, it is suggested that clinicians involve the spouse in the treatment of injured workers (as indicated in previous research on chronic pain patients) to promote positive marital communication and pinpoint other deficits in marital functioning that may affect the treatment outcome. It is
noteworthy that participants in this study found that by simply completing the assessments required, an increase in positive communication was reported.

Upon reflecting on the current study, one aspect that I would consider changing is to include the three subscales of the Pain Catastrophizing Scale versus just using the total score to further examine this phenomenon. Since this was a significant part of the study, further analysis using the subscales likely would have been warranted. Another consideration would be to offer compensation for study participants, which may have produced a larger sample size.

**Factor Analysis of Scales**

The West-Haven Yale Multidimensional Pain Inventory (WHYMPI) was chosen for this study based on its previous demonstration of good reliability and validity. The reliability estimates for the thirteen scales appear to be very satisfactory, ranging from .70 to .90, and the stability coefficients were in the .62-.91 range, indicating that a substantial proportion of the reliable variance in these scales was stable over time (Kerns, Turk and Rudy, 1985). In addition, the ease of administration and stable theoretical application with respect to the cognitive-behavioral aspect of chronic pain proved to be a good fit with this population. Finally, the WHYMPI specifically assesses the patient’s perception of the role of significant others in the development and maintenance of their chronic pain, which was a central component of this study.

When examining the intercorrelations among the WHYMPI scales, Kerns et al. (1985) found several within-scale correlations that were presented in matrix form. However, a factor analysis of the scales was missing, whereas a McQuitty Linkage Analysis was done in the present study. By using the McQuitty method in Kerns’ et al.
(1985) study, similarities between that study and the present study are: (a) the pain severity scale and interference scale were grouped within the same cluster, and (b) punishing responses, solicitous responses, and distracting responses were grouped within the same cluster. The present study expanded on this last finding in that punishing, solicitous, and distracting responses were grouped within the same cluster twice (i.e., from the injured worker’s perspective and from the partner’s perspective). One difference between these two studies is that Kerns et al. (1985) put life control and affective distress within the same cluster, whereas the present study did not. Although there was not a significant correlation between the pain severity and interference scales in this study, these constructs were grouped within the same cluster (Cluster I), indicating a strong relationship that likely would have been significant had the sample size been larger. Scale intercorrelations that were significant in this study and reaffirmed findings by Kerns et al. (1985) were between solicitous responses and support, punishing responses and solicitous responses, punishing responses and distracting responses, and solicitous responses and distracting responses. Furthermore, the direction of these correlations coincided with Kerns’ findings. Other intercorrelations among the WHYMPI scales were between punishing responses and support, distracting responses and support, and affective distress and punishing responses; all of which were constructs grouped within Cluster II in this study, but did not yield significant correlations.

A second factor structure found by Kerns et al. (1985) represented support from significant others. Within this factor, marital satisfaction (as measured by the Marital Adjustment Scale) was highly correlated with the WHYMPI scales of support, solicitous responses, and distracting responses, while punishing responses was negatively correlated
with this factor. Similarly, the present study found a significant correlation between marital satisfaction (as measured by the DAS) and solicitous responses. The Dyadic Adjustment Scale (DAS) is a widely used instrument for clinical and research applications with couples (Spanier, 1976). The measurement of both partners’ perceptions of the relationship allows the researcher to obtain different views of the relationship for integration into a total diagnostic picture, and enables the clinician to see how the partners’ ratings of the relationship converge and differ. Furthermore, the DAS total score has an impressive internal consistency with an alpha of .96 (Spanier, 1976).

The West-Haven Yale Multidimensional Pain Inventory for Significant Others (WHYMPI-SO) was administered to correlate the partner’s response to the injured worker’s pain with the injured worker’s perception of the partner’s response to their pain (solicitous, distracting, or punishing). It can be suggested that, of the two sources of data, those from significant others more accurately reflect their actual behavior. The WHYMPI-SO has strong internal consistency with alpha coefficients of .80 for solicitous, .75 for distracting, and .80 for punishing responses (Kerns and Rosenberg, 1995). A significant scale intercorrelation found by Kerns and Rosenberg (1995) on the WHYMPI-SO was between solicitous responses and distracting responses. Interestingly, this was the primary correlation found in this study within the Cluster IV grouping, and very similar in the level of significance. This is impressive given the vast difference in sample size between the two studies (i.e., $n = 123$ in the Kerns and Rosenberg study and $n = 20$ in this study). Another similarity between these two studies is that no significant relationship was found between punishing responses and distracting responses, although they were grouped within the same cluster. In other research by Sharp and Nicholas
(2000), solicitous responses on the WHYMPI-SO was significantly correlated with solicitous responses on the WHYMPI, which also proved to be true in this study, and confirms similar viewpoints on the part of the patient and spouse when rating the frequency of solicitous responses to pain behaviors.

The Pain Catastrophizing Scale (PCS) is a commonly used self-report measure designed to assess catastrophizing in community as well as clinical pain samples (Sullivan et al., 1995). The PCS can be completed and scored in around five minutes, which was also a consideration for use with this population. Factor analyses of the PCS have shown that catastrophizing can be viewed as a multidimensional construct comprising elements of rumination ("I can’t stop thinking about how much it hurts"), magnification ("I worry that something serious may happen"), and helplessness ("There is nothing I can do to reduce the intensity of the pain"). The PCS has been shown to have adequate to excellent internal consistency, with a strong alpha coefficient for the PCS total score (.87) (Sullivan et al., 1995). Thus the PCS total score was used for the purpose of this study. Previous research has documented a link between pain catastrophizing and interference (Flor and Turk, 1988; Osman et al., 2000; Chibnall and Tait, 2005) using measures such as the PCS and the WHYMPI. Therefore, it was not surprising that a significant correlation was found between these two constructs in this study, linking Cluster I with Cluster II. In sum, there were sufficient scale intercorrelations found within this study. These findings support previous research on pain catastrophizing, response to pain behaviors, and relationship satisfaction; and further defines the intricate relationships among these constructs.
Limitations of Study

As indicated in the results of this study, several limitations exist. There were a number of possible recruits who initially expressed interest in the study, but never followed through with participation in the study. A frequent explanation for this was that the injured worker’s partner did not wish to participate in the study. This could also explain the imbalanced gender sample since most of the resistant spouses were male versus female. One factor which may influence a better attrition rate in future studies may be to offer compensation for study participants.

Given the limits of the sample size in this study, external validity was greatly compromised, creating a higher probability of Type II error. As a result, the researcher may have failed to detect relationships that otherwise would have been significant had there been a larger sample size. Since the sample consisted mostly of male patients versus female patients (18 and 2 respectively), findings of this study cannot be generalized to female injured workers. As previously mentioned, research in the area of gender differences may clarify relationships studied in the current data set. In addition, due to the non-random sample in this study, cooperation may have been elicited from a specific group of injured workers whose self-assessments were unique to them in some way; therefore, findings may not be generalizable to other similar patients, even other patients within the selected private practice. Another limitation is the fact that the injured workers in this study were all married versus cohabitating or in a mutual committed relationship; therefore, results cannot be generalizable to injured workers who are cohabitating out of wedlock, or to injured workers in a same-sex marriage or committed relationship. Despite the limitations of the study, the results will be a valuable addition to
the existing literature on chronic pain patients and relationship satisfaction from the perspective of both partners, and from the unique perspective of the injured worker.

**Suggestions for Future Research**

Given the limitations of the study, several suggestions for future research can be made. This study should be replicated with a more balanced sample of male and female subjects to test for gender differences in chronic pain patients. Since it is not known whether these results are generalizable to unmarried chronic pain patients who are cohabitating or in a mutual relationship, systematic exploration of the effects of type of partnership (e.g., married, committed and cohabitating, committed but not cohabitating) would be useful. While experimenter bias is not clearly a threat in this study, the possibility of experimenter bias can be prevented by taking the researcher out of the selection process altogether, which would improve the internal validity of the results. A dimension not explored in this study was the moderating influence of therapy on the relationship between pain catastrophizing, pain behavior, and relationship satisfaction. A comparison of relationships among these variables using the population of injured workers who are receiving psychological treatment for chronic pain patients and those who are not receiving any type of psychological treatment would clearly be beneficial. In addition, the moderating influence of secondary gain (disability compensation) on pain catastrophizing and relationship satisfaction among injured workers suffering from chronic pain and their partners may be useful in clarifying social and economic influences among these relationships.

It is hoped that future research will expand on this study in an effort to improve the validity and consistency of the findings. More importantly, treatment implications
from this study may prove to be an integral component of the well being of the injured worker afflicted with chronic pain and the quality of their relationship with their spouse or significant other. Interventions designed specifically to improve communication and to reduce discrepancies of perception between pain patients and significant others may produce a greater adjustment to their pain and ultimately, a more harmonious relationship with their partner versus patient-centered interventions.
References


quality of life and pain beliefs among people suffering from chronic pain.


Appendix A

Recruitment Scripts

Script for recruitment of mental health professionals:

I am a doctoral student in the Counseling Program at the University of Cincinnati. My dissertation research is intended to better understand the injured worker’s pain and how this impacts their life as well as the life of their spouse or significant other and the quality of their relationship. Your assistance in recruiting eligible patients for this study would be greatly appreciated. Results will be used to improve the treatment of these patients by mental health professionals. If you have further questions about this study, please contact me in person. Thank you.

Script for recruitment of participants by cooperating mental health professionals: (script may be used in person or over the phone)

One of our therapists here is conducting research to better understand how chronic pain impacts patients lives, such as yourself, as well as the life of significant others and the quality of the relationship between the patient and significant other. She is a doctoral student in the Counseling Program at the University of Cincinnati and completing this study is part of her doctoral training. She is conducting a study using patients from this practice to gather research. Participation in this study is not required, and is strictly voluntary. There will be absolutely no consequences for you if you decide not to participate in the study. Does this sound like something you and your significant other would be interested in?

IF YES: I will forward your name and phone number to her. She will contact you with a complete description of the study so you can make a fully informed decision about whether or not you and your significant other want to participate.

IF NO: I appreciate you taking the time to listen to this request.

Script for recruitment of participants by the researcher: (script may be used in person or over the phone)

I am a doctoral student in the Counseling Program at the University of Cincinnati. I am working on research to better understand your pain and how this affects your life as well as the life of your spouse or significant other and the quality of your relationship. To gather this research, I am conducting a study using patients from this office and their spouses or significant others. Participation in this study is not required, and is strictly voluntary. You are one of many patients I will be talking to about this study, so your participation is not required for this study to be carried out, or for me to complete this study. You will continue receiving the same level of quality care and treatment as a
patient at this office whether or not you decide to participate in this study. Does this sound like something you and your significant other would be interested in?

**IF YES:** Before you make a final decision, let me give you a more complete description of the study so you and your significant other can make a fully informed decision about whether or not you want to participate. If you do, please read this consent form (Appendix B), ask any questions you may have, and sign the consent form. Once this is completed, then we can set up a convenient date and time for you and your significant other to fill out the questionnaires. You may also take the consent form home to think about it and discuss it further with your spouse or significant other before making a decision to take part in the study.

**IF NO:** I appreciate you taking the time to listen to this request.
Appendix B

Letter of Informed Consent
University of Cincinnati
Consent to Participate in a Research Study
College of Education, Criminal Justice, and Human Services
Laurie A. Walker, M.A., PCC
(513) 825-6600

Title of Study: The impact of pain catastrophizing on perception of partner response to pain behaviors and relationship satisfaction among male and female injured workers suffering from chronic pain

Introduction: It is important that you understand the following before you take part in this study. It describes the purpose of the study and assessments to be completed by you. It also describes the risks and benefits of the study. You have the right to leave or discontinue the study at any time.

Flesch-Kincaid Grade Level= 8.2

Purpose of Study: The reason for this study is to understand how the patient’s pain behaviors affect their sense of marital or relationship satisfaction with their significant other, and to understand how the patient’s significant other responds to these pain behaviors and how this affects the significant other’s sense of marital or relationship satisfaction.

Flesch-Kincaid Grade Level= 12.0

Duration and Procedures: Patients who agree to participate in this study will complete 3 separate assessments. The first assessment (The Pain Catastrophizing Scale) will measure the patient’s level or intensity of pain and how they respond to this pain. There are 13 questions on this assessment, which will take approximately 10 minutes or less to complete. The second assessment (The West-Haven Yale Multidimensional Pain Inventory) will measure the impact of pain on the patient’s life, the responses of the significant other to the patient’s communication of pain, and the level to which patients participate in common daily activities. There are 3 parts to this assessment, which will take approximately 30-45 minutes to complete. The third assessment (The Dyadic Adjustment Scale) will measure the quality of the relationship as perceived by married or cohabitating couples. There are 32 questions on this assessment, which will take approximately 15-25 minutes to complete. The patient’s significant other will complete 2 separate assessments. The first assessment (The West-Haven Yale Multidimensional Pain Inventory for Significant Others) will measure the significant other’s perceptions of the level to which pain is impacting their life as well as the patient’s life. It will also determine the significant other’s responses when their partner is in pain. There are 2 parts to this assessment, which will take approximately 30 minutes or less to complete. The second assessment to be completed by the significant other is the Dyadic Adjustment Scale, which is explained above. Patients and their significant others will ideally complete the assessments at the office of Michael T. Farrell, Ph.D. & Associates. In the
case where the spouse or significant other is unable to come to this office due to other obligations such as work, etc., they may complete the assessments at home.

**Flesch-Kincaid Grade Level= 12.0**

**Exclusion:** Patients who have been in treatment less than 6 months and/or married or cohabitating with their partner less than 1 year.

**Flesh-Kincaid Grade Level= 10.3**

**Risks/Discomforts:** There are no likely risks or discomforts related to this study. You may feel some discomfort when you are answering some of the questions on the assessments. If extreme discomfort or unexpected risks happen, you have the right to discontinue the study. You may also discuss discomfort and risks with the researcher (Laurie Walker) by talking to me in person or contacting me at (513) 825-6600.

**Flesh-Kincaid Grade Level= 11.6**

**Benefits:** This study was started to help counselors and psychologists better understand how the patient’s pain affects their life as well as the life of their significant other and the quality of their relationship. It may also help participants better understand how the patient’s pain affects them and the quality of their relationship. Results will be used to make suggestions to improve treatment of these patients.

**Flesch-Kincaid Grade Level= 12.0**

**Confidentiality:** Every effort will be made to keep your records private. The researcher’s advisor at the University of Cincinnati will be allowed to read sections of the research records related to this study. The data from this study may be published and/or presented at conferences; however, you will not be identified by name. Your identity will remain private unless disclosure is required by law, such as mandatory reporting of child abuse, elder abuse, or immediate danger to self or others. Records will be stored in a locked file cabinet and destroyed after the study is completed.

**Flesh-Kincaid Grade Level= 11.6**

**Payments to Participants:** You will not be paid to participate in this study.

**Flesh-Kincaid Grade Level= 8.5**

**Right to Refuse or Withdraw:** Your participation is voluntary. You may refuse to participate, or may discontinue participation at any time. You may do this without penalty or loss of benefits. The researcher also has the right to withdraw you from the study at any time. Your withdrawal from the study may be for reasons related solely to you (for example, you do not meet criteria for participation in the study and/or your spouse or significant other is unable to participate in the study) or because you or your spouse were unable to complete the required assessments.

**Flesh-Kincaid Grade Level= 12.0**

**Offer to answer questions:** If you have any questions about this study, you may contact Laurie Walker in person or by calling (513) 825-6600 or her advisor, Dr. Bob Wilson at (513) 556-3345. If you have any questions about your rights as a research participant,
you may contact Dr. Margaret Miller, Chair of the Institutional Review Board-Social and Behavioral Sciences at (513) 558-5784.

Flesh-Kincaid Grade Level= 12.0

**Legal Rights:** Nothing in this consent form waives any right you may have. Also, it does not release the researcher or the institution or its agents from liability for negligence.

Flesh-Kincaid Grade Level= 9.9

**I HAVE READ AND UNDERSTAND THE INFORMATION PROVIDED ABOVE AND I VOLUNTARILY AGREE TO PARTICIPATE IN THIS STUDY. I WILL RECEIVE A COPY OF THIS CONSENT FORM FOR MY INFORMATION.**

____________________________________________  __________________
Participant’s Signature  Date

____________________________________________
Signature and Title of Person Obtaining Consent  Date

____________________________________________
Identification of Role in Study